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EPA REGION VIII
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UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 8

IN THE MATTER OF:
Kennecott NE Stockton Property
CERCLA Site ID # 08-PD
Stockton, Tooele County, Utah

Kennecott Utah Copper LLC, its wholly-
owned subsidiary OM Enterprises Company
and their affiliate Kennecott Barneyes
Canyon Mining Company
Respondents

ADMINISTRATIVE SETTLEMENT
AGREEMENT AND ORDER ON
CONSENT FOR REMOVAL ACTION

U. S. EPA Region 8
CERCLA Docket No. CERCLA-08-2009-0005

Proceeding Under Sections 104, 106(a), 107
and 122 of the Comprehensive
Environmental Response, Compensation,
and Liability Act, as amended, 42 U. S. C.
§§ 9604, 9606(a), 9607 and 9622

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent ("Settlement Agreement") is entered into voluntarily by the United States Environmental Protection Agency ("EPA") and Kennecott Utah Copper LLC ("KUC"), its wholly-owned subsidiary, OM Enterprises Company and their affiliate Kennecott Barney's Canyon Mining Company ("Respondents"). Respondents have completed a Site Investigation and this Settlement Agreement provides for (1) the performance of a removal action encompassing Work (as defined herein) by Respondents at or in connection with the "Kennecott NE Stockton Property", CERCLA Site #08-PD (the "Site") generally located outside of Stockton, Tooele County, Utah; and, (2) the reimbursement of certain past and future response costs incurred by the United States at the Site; and (3) dismissal with prejudice of a lawsuit filed by KUC in the year 2000.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9604, 9606(a), 9607 and 9622, as amended ("CERCLA").

3. EPA has notified and consulted with the State of Utah (the "State") regarding this action, pursuant to Section 106(a) of CERCLA, 42 U. S. C. § 9606(a).

4. EPA and Respondents recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondents in accordance with this Settlement Agreement do not constitute an admission of any liability. Negotiations for this Agreement were specifically predicated on Respondents agreeing to dismiss with prejudice the listing challenge filed in the United States Court of Appeals for the District of Columbia Circuit, case number 00-1197. Respondents do not admit, and retain the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV and V of this Settlement Agreement. Respondents agree to comply with and be bound by the terms of this Settlement Agreement and further agree that they will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon EPA and upon Respondents and their heirs, successors and assigns. Any change in ownership or corporate status of Respondents including, but not limited to, any transfer of assets or real or personal property shall not alter such Respondents' responsibilities under this Settlement Agreement.

6. Respondents are jointly and severally liable for carrying out all activities required by this Settlement Agreement. In the event of the insolvency or other failure of any one or more

Respondents to implement the requirements of this Settlement Agreement, the remaining Respondents shall complete all such requirements.

7. Respondents shall ensure that their contractors, subcontractors, and representatives conducting Work at the Site receive a copy of this Settlement Agreement and comply with this Settlement Agreement. Respondents shall be responsible for any noncompliance with this Settlement Agreement. Respondents shall ensure that all successors in title or anyone to whom any interest in the property in the Site indicated herein is conveyed shall receive notice of the matters addressed herein, and any contamination remaining on or around the subject Site by means of institutional controls, including but not limited to, an environmental covenant in the form of Appendix A.

III. DEFINITIONS

8. Unless otherwise expressly provided in this Settlement Agreement, terms used in this Settlement Agreement which are defined in CERCLA or in regulations and guidance promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations and guidance. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. "Action Memorandum" shall mean the EPA Action Memorandum relating to the Site signed on March 31, 2009, by the Regional Administrator, EPA Region 8, or his/her delegate, and all attachments thereto. The Action Memorandum is attached as Appendix B.

b. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U. S. C. § 9601, *et seq.*

c. "Day" shall mean a calendar day. In computing any period of time under this Settlement Agreement, where the last day would fall on a Saturday, Sunday, or Federal holiday, the period shall run until the close of business of the next working day.

d. "Effective Date" shall be the effective date of this Settlement Agreement as provided in Section XXIX.

e. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States, its contractors or agents.

f. "UDEQ" shall mean the Utah Department of Environmental Quality and any successor departments or agencies of the State.

g. "Future Response Costs" shall mean all costs incurred after the Effective Date of this Agreement, including, but not limited to, direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement

Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement, including but not limited to, payroll costs, contractor costs, travel costs, laboratory costs, the costs incurred pursuant to Paragraph 21 (costs and attorneys fees and any monies paid to secure access, including the amount of just compensation), and Paragraph 31 (emergency response), and Paragraph 56 (work takeover).

h. "Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U. S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U. S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

i. "Interim Response Costs" shall mean all costs, including direct and indirect costs, paid by the United States in connection with the Site after December 12, 2008 and prior to the Effective Date, even if paid after that date.

j. "National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U. S. C. § 9605, codified at 40 C. F. R. Part 300, and any amendments thereto.

k. "Paragraph" shall mean a portion of this Settlement Agreement identified by an Arabic numeral.

l. "Parties" shall mean EPA and Respondents.

m. "Past Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs attributable to this Settlement Agreement, that the United States paid at or in connection with the Site through December 12, 2008, plus Interest on all such costs through such date.

n. "Respondents" shall mean Kennecott Utah Copper LLC ("KUC"), its wholly-owned subsidiary, OM Enterprises Company and their affiliate Kennecott Barneys Canyon Mining Company, including their successors and assigns.

o. "Section" shall mean a portion of this Settlement Agreement identified by a Roman numeral.

p. "Site" shall mean the Kennecott NE Stockton Property, CERCLA Site #08-PD, encompassing all land owned by Kennecott Barneys Canyon Mining Company within Sections 24, 25 and 36, Township 4 South, Range 5 West located in Tooele County, Utah and depicted generally on the map attached as Appendix C and described in Appendix E, but excluding the "Kennecott Waterman Area Parcel," Lot 2, Section 24, T. 4 South, R. 5 West, which is covered by the Administrative Settlement Agreement and Order on Consent for Removal Action (CERCLA Docket No. CERCLA-08-2008-0008). To the best of Respondents' knowledge, Respondent

Kennecott Barney's Canyon Mining Company owns the property within the presently identified boundaries of the Site, having recently acquired the land from OM Enterprises Company.

- q. "State" shall mean the State of Utah, Department of Environmental Quality.
- r. "Settlement Agreement" shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto (listed in Section XXIX). In the event of conflict between this Settlement Agreement and any appendix, this Settlement Agreement shall control.
- s. "Site Investigation" shall mean the activities and sampling data summarized in the "Characterization and Source Assessment of Lead and Arsenic Contamination, Kennecott Stockton Northeast Parcel", dated December 2008.
- t. "Waste Material" shall mean 1) any "hazardous substance" under Section 101(14) of CERCLA, 42 U. S.C. § 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U. S. C. § 9601(33); 3) any "solid waste" under Section 1004(27) of RCRA, 42 U. S. C. § 6903(27); and 4) any hazardous material as defined by the State of Utah and the Utah Department of Environmental Quality (UDEQ).
- u. "Work" shall mean all activities Respondents are required to perform under this Settlement Agreement.
- v. "Work Plan" shall mean the plan for implementation of the Removal Action, as set forth in Attachment D to this Settlement Agreement and any modifications made thereto in accordance with this Settlement Agreement.

IV. FINDINGS OF FACT

- A. The entire Site is approximately 469.4 acres and is located at the base of the west side of the Oquirrh Mountains within Rush Valley, Tooele County, Utah. The general area contained many mines and multiple historical smelters which were operational during the latter half of the 19th century.
- B. Smelting activities and the attendant mining activities in the area resulted in large amounts of waste materials containing heavy metals contaminating large areas. This Site is adjacent to the area known as the Jacob's Smelter Superfund Site SSID 08-2X (Jacobs).
- C. Following Respondents initial voluntary Site activities, it became clear that the Site differs from Jacobs in many particulars, including but not limited to; topography and persistence of potential recontamination or further contamination. These particulars are significant because they indicate that the appropriate remedial

measures and the appropriate timing of remedial measures are different for the Site, than those at Jacobs.

- D. In October of 2008, Respondents, while performing additional field Site characterization, discovered levels of lead contamination at the Site higher than had been anticipated. Waste material at the Site contains levels up to 67,000 ppm of lead and 16,000 ppm arsenic.
- E. In 1999 when Jacobs was identified and proposed for listing on the National Priorities List (NPL), maps of Jacobs included Site areas. Areas within the Site were sparsely sampled during the 2001 Jacobs Remedial Investigation and were included within the initial maps of Jacobs. Respondents filed a challenge to the Jacobs listing and this Settlement Agreement relates to that listing challenge to the extent the Site was included in the Jacobs NPL listing.
- F. EPA has formally created this Site and has severed the Site from Jacobs to allow the appropriate response action as set forth in the attached Work Plan. The Site is not listed nor will it be proposed for NPL listing.
- G. In an effort to address concerns about the appropriate response to the heavy metals containing waste at the Site, the Respondents, without admitting liability, have voluntarily completed the Site Investigation and have volunteered to undertake the Removal Action indicated in the Work Plan and required by EPA.
- II. The full legal description of the Site is contained in Appendix E.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

9. Based on the Findings of Fact set forth above, and preliminary information gathered relating to the Site and supporting this removal action, EPA has determined that:

- a. The Site is a "facility" as defined by Section 101(9) of CERCLA, 42 U. S. C. § 9601(9).
- b. The heavy metal contamination found at the Site, is a "hazardous substance(s)" as defined by Section 101(14) of CERCLA, 42 U. S. C. § 9601(14).
- c. Each Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U. S. C. § 9601(21).
- d. Each Respondent is a responsible party under Section 107(a) of CERCLA, 42 U. S. C. § 9607(a), and is jointly and severally liable for performance of response action and for response costs incurred and to be incurred at the Site. Respondents are the past or present

“owner(s)” of the facility, as defined by Section 101(20) of CERCLA, 42 U. S. C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U. S. C. § 9607(a)(1).

e. An actual or threatened “release” of a hazardous substance exists at the facility as defined by Section 101(22) of CERCLA, 42 U. S. C. § 9601(22).

f. The removal action required by this Settlement Agreement is necessary to fully evaluate the threat to public health or welfare or the environment, and to respond to the contamination at the Site, and, if carried out in compliance with the terms of this Settlement Agreement, will be consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

VI. SETTLEMENT AGREEMENT AND ORDER

Based upon the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for this Site, it is hereby Ordered and Agreed that Respondents shall comply with all provisions of this Settlement Agreement, including, but not limited to, all appendices to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND ON-SCENE COORDINATOR

10. Respondents shall notify EPA of the name(s) and qualification(s) of any contractor(s), subcontractor(s) or engineer(s) retained to perform the Work at least 7 days prior to commencement of such Work. EPA retains the right to disapprove of, for good cause, any or all of the contractors and/or subcontractors and/or engineer(s) retained by Respondents. If EPA disapproves of a selected contractor, subcontractor, or engineer, Respondents shall retain a different contractor, subcontractor, or engineer and shall notify EPA of that name and qualifications of the person selected within 7 days of EPA’s disapproval.

11. Within 30 days prior to implementation of Work, Respondents shall designate a Project Coordinator who shall be responsible for administration of all actions by Respondents required by this Settlement Agreement. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Work at the Site. EPA has the right to disapprove this Project Coordinator. If a different or additional Project Coordinator is designated, EPA retains the right to disapprove of the designated Project Coordinator. If EPA disapproves of a designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person’s name, address, telephone number, and qualifications within 10 days following EPA’s disapproval. Receipt by Respondents’ Project Coordinator of any notice or communication from EPA relating to this Settlement Agreement shall constitute receipt by all Respondents.

12. EPA has designated Duc Nguyen of the Office of Ecosystems Protection and Remediation, Site Assessment Division of Region 8 EPA, as its On-Scene Coordinator ("OSC"). Except as otherwise provided in this Settlement Agreement, Respondents shall direct all submissions required by this Settlement Agreement to the OSC (Mr. Nguyen) at 1595 Wynkoop Street, Denver Colorado 80202-1129 mail code EPR-SR. Respondents may choose to use certified mail, express mail, or other delivery method documenting delivery. Informal submissions may be made by e-mail to Nguyen.Duc@epa.gov. Copies of documents to be submitted to UDEQ shall be submitted to Tom Daniels, Utah Department of Environmental Quality, 168 North 1950 West, Salt Lake City, Utah 84114, or informal submissions may be sent to: Tdaniels@utah.gov.

13. EPA and Respondents shall have the right, subject to Paragraph 11, to change their respective designated OSC, or Project Coordinator. Respondents shall notify EPA 10 days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

14. Respondents shall perform, at a minimum, all actions necessary to implement the Work Plan. The actions to be implemented generally include, but are not limited to, the following:

- a. Providing physical access controls at the Site;
- b. Limited additional soil sampling at the Site;
- c. Qualified laboratory analysis or EPA approved analysis of soil samples for metals including, lead and arsenic;
- d. Drafting and submittal of monthly and final Report(s), starting with implementation of the Work and ending with completion of the Work, to the satisfaction of EPA and in accordance with the NCP, including complying with all applicable or relevant and appropriate requirements (ARAR's);
- e. Complying with Institutional Controls, as determined by EPA and the State to be applicable;
- f. Performing all other requirements in accordance with this Agreement, the Work Plan attached hereto (Appendix D) and all EPA required modifications.

15. Work Plan and Implementation.

a. Respondents have submitted a Work Plan to the EPA, attached as Appendix D. The Work Plan provides a description of, and an expeditious schedule for, actions required by this Settlement Agreement. EPA approves this Work Plan contemporaneously with this Settlement Agreement.

b. EPA may require revisions to or modify the Work Plan in whole or in part if new information beyond the data considered in the Site Investigation necessitates such revision or modification. If EPA requires revisions, Respondents shall submit a revised draft Work Plan within 10 days of receipt of EPA's notification of the required revisions. Respondents shall implement the Work Plan as approved in writing by EPA in accordance with the schedule approved by EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be incorporated into and become fully enforceable under this Settlement Agreement.

c. Respondents shall not commence any Work except in conformance with the terms of this Settlement Agreement.

16. Health and Safety Plan. At least 30 days prior to commencing any Work, Respondents shall submit for EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Settlement Agreement. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285. 1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 C. F. R. Part 1910. If EPA determines that it is appropriate, the plan shall also include contingency planning. Respondents shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the removal action.

17. Quality Assurance and Sampling. a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures. Respondents shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate EPA guidance. Respondents shall follow, as appropriate, "Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures" (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondents shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, "Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs" (American National Standard, January 5, 1995), and "EPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001)," or equivalent documentation as determined by EPA. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program ("NELAP") as meeting the Quality System requirements.

b. Upon request by EPA, Respondents shall have such a laboratory analyze samples submitted by EPA for QA monitoring. Respondents shall provide to EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by EPA, Respondents shall allow EPA or its authorized representatives to take split and/or duplicate samples of samples collected under the Work Plan. Respondents shall notify EPA not less than 21 days in advance of routine sample collection activity under the Work Plan, unless shorter notice is agreed to by EPA. Respondents shall notify EPA not less than 3 days in advance of post-storm water runoff sample collection activity under the Work Plan, unless shorter notice is agreed to by EPA. EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall allow Respondents to take split or duplicate samples of any samples it takes as part of its oversight of Respondents' implementation of the Work.

18. Reporting.

a. Respondents shall submit a written progress report to EPA concerning actions undertaken pursuant to this Settlement Agreement monthly on the anniversary date of commencement of the Work until completion of the Work, except for Operations and Maintenance, and thereafter as specified in the Work Plan, unless otherwise directed in writing by the OSC. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

b. Respondents shall submit electronic copies, along with two hard copies to EPA and one hard copy to UDEQ of all plans, reports or other submissions required by this Settlement Agreement and the Work Plan. EPA has authority to approve, disapprove or request modification of submittals.

19. Final Report. Within 45 days after completion of all Work required by the OSC, and this Settlement Agreement, Respondents shall submit for EPA review and approval a final report summarizing the actions taken to comply with this Settlement Agreement. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports." The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a presentation of all sampling and analysis performed and information gathered, evaluation of information as to location of sources of any hazardous substances or materials, and summary of potential source removal actions, and any difficulties foreseen in possible removal actions, and shall summarize all activities required by the Work Plan and accompanying appendices. It shall contain all relevant

documentation generated during the removal action (e.g., manifests and permits). The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

“Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

IX. SITE ACCESS AND INSTITUTIONAL CONTROLS

20. a. If the Site, or any other property where access is needed to implement this Settlement Agreement or Site work, is owned or controlled by any of the Respondents or any person affiliated with Respondents, then Respondents shall, commencing on the Effective Date, provide EPA, the State, and their representatives, including contractors, with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this Settlement Agreement or Site remediation. In addition, Respondents shall notify any persons to whom they transfer any interest in the Site of the contamination known to Respondents, remaining on or around the Site at the Completion of Work (Section XXVIII). Respondents agree to require that their successors or persons to whom they transfer any interest in the Site comply with this Section, and Sections IX (Site Access) and X (Access to Information).

b. Respondents shall execute an environmental covenant to the benefit of EPA and the State of Utah. Respondent shall place on the face of any instrument conveying a property interest within the Site, language submitted to and approved by EPA, giving notice of the levels of contamination known to exist at the Site. This covenant and deed with notice shall be recorded into the chain of title of all interests in the property in the Site within 30 days of submission of the Final Report (Paragraph 19). Respondents shall furnish EPA and UDEQ each with a copy of the recorded instruments within twenty days of recording. In addition, Respondents, at least 30 days prior to the conveyance of any interest in real property at the Site, shall give written notice to the transferee that the property is/was subject to this Settlement Agreement and written notice to EPA and the State of the proposed conveyance, including the name and address of the transferee. Respondents agree to require that their successors or assigns comply with this Section and Sections IX (Site Access) and X (Access to Information). Respondents shall comply with the Covenant and other Institutional Controls required by EPA or the State.

21. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondents, Respondents shall use their best efforts to obtain all necessary access agreements within 30 days after the Effective Date, or as otherwise specified in writing by the OSC. Respondents shall immediately notify EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, “best efforts” includes the payment of reasonable sums of money in consideration of access. Respondents shall describe in writing their efforts to obtain access. EPA may then assist Respondents in gaining access, to the extent necessary to effectuate the response actions described

in this Settlement Agreement, using such means as EPA deems appropriate. Respondents shall reimburse EPA for all costs and attorney's fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XV (Payment of Response Costs).

22. Notwithstanding any provision of this Settlement Agreement, EPA and the State retain all of their access authorities and rights, including enforcement authorities related thereto, under CERCLA and any other applicable statutes or regulations.

X. ACCESS TO INFORMATION

23. Upon request, Respondents shall provide to EPA and the State, copies of all documents and information within their possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Settlement Agreement, including, but not limited to: sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondents shall also make available to EPA and the State, for purposes of investigation, public participation and community relations, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

24. Respondents may assert business confidentiality claims covering part or all of the documents or information submitted to EPA and the State under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U. S. C. § 9604(e)(7), and 40 C. F. R. § 2.203(b). Documents or information determined to be confidential by EPA will be afforded the protection specified in 40 C. F. R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to EPA and the State, or if EPA has notified Respondents that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C. F. R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondents.

25. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Respondents assert such a privilege in lieu of providing documents, they shall provide EPA and the State with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

26. No claim of confidentiality shall be made with respect to any data, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XI. RECORD RETENTION

27. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondents shall preserve and retain all non-identical copies of records and documents (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 10 years after Respondents' receipt of EPA's notification pursuant to Section XXVIII (Notice of Completion of Work), Respondents shall also instruct their contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work. For the purposes of this Section, records or documents can include either electronic or written/paper documents; however, the requirement to retain such records does not apply to both forms, but to either at the discretion of Respondents.

28. At the conclusion of this document retention period, Respondents shall notify EPA and the State at least 90 days prior to the destruction of any such records or documents, and, upon request by EPA, Respondents shall deliver any such records or documents to EPA or, if requested, the State of Utah. Respondents may assert that certain documents, records and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If Respondents assert such a privilege, they shall provide EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondents. However, no documents, reports or other information created, utilized, or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

29. Each Respondent hereby certifies individually that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of its potential liability at Jacobs or this Site, or the filing of suit against it regarding the Site and that it has fully complied with any and all EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U. S. C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U. S. C. § 6927.

XII. COMPLIANCE WITH OTHER LAWS

30. Respondents shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable state and federal laws and regulations except as provided in

Section 121(e) of CERCLA, 42 U. S. C. § 6921(e), and 40 C. F. R. §§ 300.400(e) and 300.415(j). In accordance with 40 C. F. R. § 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws. Respondents have identified ARARs in the Work Plan.

XIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

31. In the event any action or occurrence during performance of the Work causes or threatens a release from the Site of a reportable quantity of Waste Material originating at the Site that constitutes an emergency situation, or may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action. Respondents shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondents shall also immediately notify the OSC or, in the event of his/her unavailability, the Regional Duty Officer at (303) 293-1788 of the incident or Site conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, Respondents shall reimburse EPA all costs of the response action not inconsistent with the NCP pursuant to Section XV (Payment of Response Costs).

32. In addition, as soon as Respondents have knowledge of any release from the Site of a reportable quantity of a hazardous substance originating at the Site, Respondents shall immediately notify the OSC at (303) 293-1788 and the National Response Center at (800) 424-8802. Respondents shall submit a written report to EPA within 7 days after each such release notification, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. Respondents shall also document in accordance with the Work Plan any observed release onto the Site of a reportable quantity of a hazardous substance originating from upgradient of the Site. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U. S. C. § 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U. S. C. § 11004, *et seq.*

XIV. AUTHORITY OF ON-SCENE COORDINATOR

33. The OSC shall be responsible for overseeing Respondents' implementation of this Settlement Agreement. The OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of the OSC from the Site shall not be cause for stoppage of work unless specifically directed by the OSC.

XV. PAYMENT OF RESPONSE COSTS

34. Payment for Past Response Costs.

a. Within 30 days after the Effective Date, Respondents shall pay to EPA \$3,190.03 for Past Response Costs. Payment shall be made by wire transfer or certified or cashier's check made payable to "EPA Hazardous Substance Superfund." For certified or cashier's check, payment must be received by 11:00 a. m. Eastern Time for same day credit. Each check, or a letter accompanying each check, shall identify the name and address of the party(ies) making payment, the Site name, the EPA Region and Site ID Number 08-PD, and the EPA docket number for this action, and shall be sent to:

Regular Mail:

U.S. Environmental Protection Agency
Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO 63197-9000

Express Mail:

U. S. Bank
Government Lock Box 979076
USEPA Superfund Payments
1005 Convention Plaza
SL-MO-C2-GL
St. Louis, MO 63101
Phone 314-418-1028

Wire Transfer:

Federal Reserve Bank of New York
ABA 021030004
Account 68010727

ACH Transactions:

PNC Bank/Remittance Express
ABA 05103676
Account 310006
CTX Format, Transaction Code 22, checking

On-Line Payments:

There is now an on-line payment option available through the Department of Treasury. This option can be accessed from information available at

WWW.PAY.GOV

b. At the time of payment, Respondent shall send notice that payment has been made by e-mail to acctreceivable.cirwd@epa.gov, and to:

Dana Anderson, NWD
EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

And

Kelcey Land, Cost Recovery Program Manager
ENF-RC, US EPA
1595 Wynkoop Street
Denver, CO 80202-1129.

c. The total amount to be paid by Respondent pursuant to Paragraph 34(a) shall be deposited in the Kennecott NE Stockton Property Site (08-PD) Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site or with Jacobs (SSID08-2X), or to be transferred by EPA to the EPA Hazardous Substance Superfund.

35. Payments for Future Response Costs.

a. Respondents shall pay EPA all Future Response Oversight Costs attributable to oversight of the Work and this Settlement Agreement, not inconsistent with the NCP until the later of (1) Notice of Completion of the Work according to Section XXVIII or (2) dismissal of Case Number 00-1197 as agreed in Paragraph 64(c) herein. Payment shall also be made for Future Costs incurred by EPA due to Respondent's O&M at the Site. On a yearly basis, EPA will send Respondents a bill requiring payment that includes a SCORPIOS report or an equivalent cost summary. Respondents shall make all payments within 45 days of receipt of each bill requiring payment, except as otherwise provided in Paragraph 37 of this Settlement Agreement.

b. Respondents shall make all payments required by this Paragraph by wire transfer or a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," referencing the name and address of the party(ies) making payment and EPA Site/Spill ID number 08-PD. For certified or cashier's check, payment must be received by 11:00 AM Eastern Time for same day credit. Respondents shall send the check(s) to:

Regular Mail:

U.S. Environmental Protection Agency

Superfund Payments
Cincinnati Finance Center
P.O. Box 979076
St. Louis, MO 63197-9000

Express Mail:

U. S. Bank
Government Lock Box 979076
USEPA Superfund Payments
1005 Convention Plaza
SL-MO-C2-GL
St. Louis, MO 63101
Phone 314-418-1028

Wire Transfer:

Federal Reserve Bank of New York
ABA 021030004
Account 68010727

ACH Transactions:

PNC Bank/Remittance Express
ABA 05103676
Account 310006
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On-Line Payments:

There is now an on-line payment option available through the Department of Treasury. This option can be accessed from information available at WWW.PAY.GOV

b. At the time of payment, Respondent shall send notice that payment has been made by e-mail to acctreceivable.cinwd@epa.gov, and to:

Dana Anderson, NWD
EPA Cincinnati Finance Office
26 Martin Luther King Drive
Cincinnati, Ohio 45268

And

Kecey Land, Cost Recovery Program Manager
ENF-RC, US EPA
1595 Wynkoop Street

Denver, CO 80202-1129.

c. The total amount to be paid by Respondent pursuant to Paragraph 34(a) shall be deposited in the Kennecott NE Stockton Property Site (08-PD) Special Account within the EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site or with Jacobs (SSID08-2X), or to be transferred by EPA to the EPA Hazardous Substance Superfund.

36. Respondents may contest payment of any Future Response Costs billed under Paragraph 35 if they determine that EPA has made a mathematical error, or if they believe EPA incurred excess costs as a direct result of an EPA action that was inconsistent with the NCP. Such objection shall be made in writing within 30 days of receipt of the bill and must be mailed by certified mail return receipt requested to the OSC. Any such objection shall specifically identify the contested Future Response Costs and the basis for objection. In the event of an objection, Respondents shall within the 45-day period pay all uncontested Future Response Costs to EPA in the manner described in Paragraph 35. Simultaneously, Respondents shall establish an interest-bearing escrow account in a federally-insured bank duly chartered in the State of Utah and remit to that escrow account funds equivalent to the amount of the contested Future Response Costs. Respondents shall send to the EPA a copy of the transmittal letter and check paying the uncontested Future Response Costs, and a copy of the correspondence that establishes and funds the escrow account, including, but not limited to, information containing the identity of the bank and bank account under which the escrow account is established, as well as a bank statement showing the initial balance of the escrow account. Simultaneously with establishment of the escrow account, Respondents shall initiate the Dispute Resolution procedures in Section XVI (Dispute Resolution). If EPA prevails in the dispute, within 45 days of the resolution of the dispute, Respondents shall pay the sums due (with accrued interest) to EPA in the manner described in Paragraph 35. If Respondents prevail concerning any aspect of the contested costs, Respondents shall pay that portion of the costs (plus associated accrued interest) for which they did not prevail to EPA in the manner described in Paragraph 35. Respondents shall be disbursed any balance of the escrow account. The dispute resolution procedures set forth in this Paragraph in conjunction with the procedures set forth in Section XVI (Dispute Resolution) shall be the exclusive mechanisms for Respondents' resolution of disputes regarding Respondents' obligation to reimburse EPA for its Future Response Costs.

XVI. DISPUTE RESOLUTION

37. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

38. If Respondents object to any EPA action taken pursuant to this Settlement Agreement, including billings for Future Response Costs, they shall notify EPA in writing of their objection(s) within 10 days of such action, unless the objection(s) has/have been resolved informally. EPA and Respondents shall have 21 days from EPA's receipt of Respondents' written objection(s) to resolve the dispute through formal negotiations (the "Negotiation Period"). The Negotiation Period may be extended at the sole discretion of EPA.

39. Any agreement reached by the parties pursuant to this Section shall be in writing and shall, upon signature by both parties, be incorporated into and become an enforceable part of this Settlement Agreement. If the Parties are unable to reach an agreement within the Negotiation Period, an EPA official at the Region 8 management level or higher will issue a written decision on the dispute to Respondents. For disputes involving the Work the EPA management official shall be the Region 8 Assistant Regional Administrator, Ecosystems Protection and Remediation. If the dispute involves cost recovery the management official shall be the Assistant Regional Administrator for Enforcement, Compliance and Environmental Justice. EPA's decision shall be incorporated into and become an enforceable part of this Settlement Agreement. Respondents' obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondents shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with EPA's decision, whichever occurs.

XVII. FORCE MAJEURE

40. Respondents agree to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, a *force majeure* is defined as any event arising from causes beyond the control of Respondents, or of any entity controlled by Respondents, including but not limited to their contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondents' best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work, increase of the work, or increased cost of performance.

41. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondents shall notify EPA orally within 48 hours of when Respondents first knew that the event might cause a delay. Within 7 days thereafter, Respondents shall provide to EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondents' rationale for attributing such delay to a *force majeure* event if they intend to assert such a claim; and a statement as to whether, in the opinion of Respondents, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall preclude Respondents from asserting any claim of *force majeure* for that event

for the period of time of such failure to comply and for any additional delay caused by such failure.

42. If EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, EPA will notify Respondents in writing of its decision. If EPA agrees that the delay is attributable to a *force majeure* event, EPA will notify Respondents in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. STIPULATED PENALTIES

43. Respondents shall be liable to EPA for stipulated penalties in the amounts set forth in Paragraphs 44 and 45 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVII (*Force Majeure*). "Compliance" by Respondents shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of law, this Settlement Agreement, the Work Plan, and any plans or other documents approved by EPA pursuant to this Settlement Agreement and within the specified time schedules established by and approved under this Settlement Agreement.

44. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 44(b):

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$ <u>100.00</u>	1st through 14th day
\$ <u>200.00</u>	15th through 30th day
\$ <u>37,500.00</u>	31st day and beyond

b. Compliance Milestones. Non-compliance is defined to include failure to fully complete all items as written herein or as directed by the OSC.

45. Stipulated Penalty Amounts - Reports. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports pursuant to Section VIII, or to comply with other requirements relating to written documents:

<u>Penalty Per Violation Per Day</u>	<u>Period of Noncompliance</u>
\$ <u>100.00</u>	1st through 14th day
\$ <u>200.00</u>	15th through 30th day
\$ <u>20,000.00</u>	31st day and beyond

46. In the event that EPA assumes performance of a portion or all of the Work pursuant to Paragraph 56 of Section XX (Reservation of Rights by EPA), Respondents shall be liable for an additional stipulated penalty in the amount of \$37,500.00.

b. In the event that Respondents fail to specifically perform as set forth in Paragraph 64(c), the stipulated penalty provided therein shall apply.

47. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after EPA's receipt of such submission until the date that EPA notifies Respondents of any deficiency; and 2) with respect to a decision by the EPA Management Official, under Paragraph 37 of Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after the Negotiation Period begins until the date that the EPA management official issues a final decision regarding such dispute. Nothing in this Settlement Agreement shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

48. Following EPA's determination that Respondents have failed to comply with a requirement of this Settlement Agreement, EPA may give Respondents written notification of the failure and describe the noncompliance. EPA may send Respondents a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether EPA has notified Respondents of a violation.

49. All penalties accruing under this Section shall be due and payable to EPA within 45 days of Respondents' receipt from EPA of a demand for payment of the penalties, unless Respondents invoke the dispute resolution procedures under Section XVI (Dispute Resolution). All payments to EPA under this Section shall be paid by wire transfer or certified or cashier's check(s) made payable to "EPA Hazardous Substances Superfund," shall be paid as outlined in Section XV above, shall indicate that the payment is for stipulated penalties, and shall reference the EPA Region and Site ID Number 08-PD, the EPA Docket Number CEPCLH-28-1007-0005, and the name and address of the party(ies) making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to EPA as provided in Section XV.

50. The payment of penalties for lack of timely submittal shall not alter in any way Respondents' obligation to complete performance of the Work required under this Settlement Agreement.

51. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 30 days after the dispute is resolved by agreement or by receipt of EPA's decision.

52. If Respondents fail to pay stipulated penalties when due, EPA may institute proceedings to collect the penalties, as well as Interest. Respondents shall pay Interest on the unpaid balance, which shall begin to accrue on the date of demand made pursuant to this Section. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of EPA to seek any other remedies or sanctions available by virtue of Respondents' violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(f) of CERCLA, 42 U. S. C. §§ 9606(b) and 9622(f), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U. S. C. § 9607(c)(3). Provided, however, that EPA shall not seek civil penalties pursuant to Section 106(b) or 122(f) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided in this Section, except in the case of a willful violation of this Settlement Agreement or in the event that EPA assumes performance of a portion or all of the Work pursuant to Section XX (Reservation of Rights by EPA), Paragraph 56. Notwithstanding any other provision of this Section, EPA may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XIX. COVENANT NOT TO SUE BY EPA

53. In consideration of the actions that will be performed and the payments that will be made by Respondents under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, EPA covenants not to sue or to take administrative action against Respondents pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. §§ 9606 and 9607(a), for the Work, Future, Interim and Past Response Costs at the Site. This covenant not to sue is conditioned upon the complete and satisfactory performance by Respondents of their obligations under this Settlement Agreement, including, but not limited to, completion of Work, payment of Response Costs pursuant to Section XV and XVIII, and dismissal with prejudice of action 00-1197 as set forth in paragraph 64(c). This covenant not to sue shall take effect upon receipt by EPA of the Past Response Costs due under Section XV of this Settlement Agreement and any Interest or Stipulated Penalties due for failure to pay Past Response Costs as required by Sections XV and XVIII of this Settlement Agreement, payment of Interim and Future Costs, and dismissal with prejudice of the listing challenge as indicated in Paragraph 64(c). This covenant not to sue extends only to Respondents and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY EPA

54. Except as specifically provided in this Settlement Agreement, nothing in this Settlement Agreement shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health or welfare or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing in this Settlement Agreement shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law.

55. The covenant not to sue set forth in Section XIX above does not pertain to any matters other than those expressly identified therein. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondents with respect to all other matters, including, but not limited to:

- a. claims based on a failure by Respondents to fully meet a requirement of this Settlement Agreement;
- b. liability for costs not included within the definitions of Past Response Costs or Future Response Costs;
- c. liability for performance of response action other than the Work;
- d. criminal liability;
- e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;
- f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and
- g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site.

56. Work Takeover. In the event EPA determines that Respondents have ceased implementation of any portion of the Work, are seriously or repeatedly deficient or late in their performance of the Work, or are implementing the Work in a manner which may cause an endangerment to human health or the environment, EPA may assume the performance of all or any portion of the Work as EPA determines necessary. At such time the EPA assumes performance of the Work, the Stipulated Penalty provided in Paragraph XVIII (Stipulated Penalties) shall become due and owing. Respondents may invoke the procedures set forth in Section XVI (Dispute Resolution) to dispute EPA's determination that takeover of the Work is warranted under this Paragraph. Costs incurred by the United States in performing the Work pursuant to this Paragraph shall be considered Future Response Costs that Respondents shall pay pursuant to Section XV

(Payment of Response Costs). Notwithstanding any other provision of this Settlement Agreement, EPA retains all authority and reserves all rights to take any and all response actions authorized by law.

XXI. COVENANT NOT TO SUE BY RESPONDENTS

57. Respondents covenant not to sue and agree not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Future Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U. S. C. § 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U. S. C. §§ 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the State Constitution, the Tucker Act, 28 U. S. C. § 1491, the Equal Access to Justice Act, 28 U. S. C. § 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U. S. C. §§ 9607 and 9613, relating to the Work or Future Response Costs.

d. Except as provided in this Section XXI (Covenants Not to Sue by Respondents), these covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraphs 55 (b), (c), and (e) - (g), but only to the extent that Respondents' claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

58. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U. S. C. § 9611, or 40 C. F. R. § 300.700(d).

59. Respondents agree not to assert any claims and to waive all claims or causes of action that they may have for all matters relating to the Site, including for contribution, against any person where the person's liability to Respondents with respect to the Site is based solely on having arranged for disposal or treatment, or for transport for disposal or treatment, of hazardous substances at the Site, or having accepted for transport for disposal or treatment of hazardous substances at the Site, if all or part of the disposal, treatment, or transport occurred before April 1, 2001, and the total amount of material containing hazardous substances contributed by such person to the Site was less than 110 gallons of liquid materials or 200 pounds of solid materials.

60. The waiver in Paragraph 59 shall not apply with respect to any defense, claim, or cause of action that a Respondent may have against any person meeting the above criteria if such person asserts a claim or cause of action relating to the Site against such Respondent. This waiver

also shall not apply to any claim or cause of action against any person meeting the above criteria if EPA determines:

a. that such person has failed to comply with any EPA requests for information or administrative subpoenas issued pursuant to Section 104(e) or 122(e) of CERCLA, 42 U. S. C. §§ 9604(e) or 9622(c), or Section 3007 of the Solid Waste Disposal Act (also known as the Resource Conservation and Recovery Act or "RCRA"), 42 U. S. C. § 6972, or has impeded or is impeding, through action or inaction, the performance of a response action or natural resource restoration with respect to the Site, or has been convicted of a criminal violation for the conduct to which this waiver would apply and that conviction has not been vitiated on appeal or otherwise; or

b. that the materials containing hazardous substances contributed to the Site by such person have contributed significantly, or could contribute significantly, either individually or in the aggregate, to the cost of response action or natural resource restoration at the Site.

XXII. OTHER CLAIMS

61. By issuance of this Settlement Agreement, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

62. Except as expressly provided Section XIX (Covenant Not to Sue by EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U. S. C. §§ 9606 and 9607.

63. No action or decision by EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U. S. C. § 9613(h).

XXIII. CONTRIBUTION AND OTHER MATTERS

64. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U. S. C. § 9613(f)(2), and that Respondents are entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U. S. C. §§ 9613(f)(2) and 9622(h)(4), solely for “matters addressed” in this Settlement Agreement. The “matters addressed” in this Settlement Agreement are the Site Investigation, the Work, any additional Work required by EPA in writing, payment of all Past, Interim and Future Response Costs associated with the Site Work require by this Agreement, Institutional Controls, and dismissal with prejudice of case # 00-1197.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42 U. S. C. § 9613(f)(3)(B), pursuant to which Respondents have, as of the Effective Date, resolved their liability to the United States for the Site Investigation, Work and Response Costs.

c. Respondents agree that within 60 days of the Effective Date of this Agreement, KUC will dismiss with prejudice *Kennecott Utah Copper Corporation v. Environmental Protection Agency*, case # 00-1197, filed in the United States District Court for the District of Columbia Circuit. If KUC fails to dismiss this case with prejudice as agreed herein, the Parties agree that a specifically negotiated stipulated penalty of \$37,500.00 shall apply, and Respondents shall be in breach of this Agreement. Notwithstanding the Stipulated Penalty, Respondents agree that EPA retains the right to all remedies allowed to it by law, including the remedy of specific performance to enforce the Respondents' Agreement to dismiss the above suit with prejudice.

XXIV. INDEMNIFICATION

65. Respondents shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondents agree to pay the United States all costs incurred by the United States, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondents, their officers, directors, employees, agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondents in carrying out activities pursuant to this Settlement Agreement. Neither Respondents nor any such contractor shall be considered an agent of the United States.

66. The United States shall give Respondents notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondents prior to settling such claim.

67. Respondents waive all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondents shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between any one or more of Respondents and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXV. INSURANCE

68. At least 10 days prior to commencing any on-Site work under this Settlement Agreement, Respondents shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and automobile insurance with limits of 2.0 million dollars, combined single limit. If requested, Respondents shall provide EPA with certificates of such insurance. If requested, Respondents shall submit such certificates each year on the anniversary of the Effective Date for the duration of the Settlement Agreement. In addition, for the duration of the Settlement Agreement, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of workers' compensation insurance for all persons performing the Work on behalf of Respondents in furtherance of this Settlement Agreement. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXVI. FINANCIAL ASSURANCE

69. In the event that response actions at the Site, including Operations and Maintenance, are estimated by EPA to cost an amount of \$5 million or more, Respondents shall establish and thereafter maintain financial assurance in an amount necessary to assure completion of the response actions. The amount of the financial assurance shall be equivalent to EPA's value of the cost of the response action. If necessary, Respondents shall, within ninety (90) days of EPA's determination that response actions at the Site are likely to cost \$5 million or more, establish one or more irrevocable letters of credit and/or surety bonds, which shall be payable to or at the direction of EPA, issued for a period of at least one year, and provide that the expiration date will be automatically extended for a period of at least one year unless the issuing financial institution

notifies Respondents by certified mail of a decision not to extend the expiration date. If the later occurs, Respondents shall obtain EPA's approval for an alternate financial assurance(s).

70. In the event that response actions at the Site, including Operations and Maintenance, are estimated by EPA to cost an amount of \$5 million or more, and if requested by EPA, within 90 days of the request, Respondents shall establish and maintain financial security for the benefit of EPA in the amount of the value of the Work, in one or more of the following forms, in order to secure the full and final completion of Work by Respondents:

- a. a surety bond unconditionally guaranteeing payment and/or performance of the Work;
- b. one or more irrevocable letters of credit, payable to or at the direction of EPA, issued by financial institution(s) acceptable in all respects to EPA;
- c. a trust fund administered by a trustee acceptable in all respects to EPA; or
- d. a policy of insurance issued by an insurance carrier acceptable in all respects to EPA, which ensures the payment and/or performance of the Work.

71. Any and all financial assurance instruments provided pursuant to this Section shall be in form and substance satisfactory to EPA, determined in EPA's sole discretion. In the event that EPA determines, based on credible financial data, at any time that the financial assurances provided pursuant to this Section (including, without limitation, the instrument(s) evidencing such assurances) are inadequate, Respondents shall, within 90 days of receipt of notice of EPA's determination, obtain and present to EPA for approval one of the other forms of financial assurance listed in Paragraph 70, above. In addition, if at any time EPA notifies Respondents that the anticipated cost of completing the Work has increased, then, within 90 days of such notification, Respondents shall obtain and present to EPA for approval a revised form of financial assurance (otherwise acceptable under this Section) that reflects such cost increase. Respondents' inability to demonstrate financial ability to complete the Work shall in no way excuse performance of any activities required under this Settlement Agreement. Respondents shall submit the original executed financial assurance documents to:

Daniela Golden
Financial Analyst
Mail Code: 8ENF-RC
U.S. EPA Region 8
1595 Wynkoop Street
Denver, CO 80202
Phone: (303) 312 - 6772

72. If, after the Effective Date, Respondents can show to the satisfaction of EPA that the estimated value to complete the remaining Work has diminished below the amount set forth in Paragraph 69, Respondents may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondents shall submit a proposal for such reduction to EPA, in accordance with the requirements of this Section, and may reduce the amount of the security after receiving written approval from EPA. In the event of a dispute, Respondents may seek dispute resolution pursuant to Section XVI (Dispute Resolution). Respondents may reduce the amount of security in accordance with EPA's written decision resolving the dispute.

73. Respondents may change the form of financial assurance provided under this Section at any time, upon notice to and prior written approval by EPA, provided that EPA determines that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondents may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVII. MODIFICATIONS

74. The OSC may approve modifications to any plan or schedule or requirements of the Work Plan in writing or by oral direction. Any oral modification will be memorialized in writing by EPA promptly, but shall have as its effective date the date of the OSC's oral direction. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.

75. If Respondents seek permission to deviate from any approved work plan or schedule or Work Plan, Respondents' Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondents may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to Paragraph 74.

76. No informal advice, guidance, suggestion, or comment by the OSC or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVIII. NOTICE OF COMPLETION OF WORK

77. When EPA determines, after EPA's review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including, *e.g.* post-removal site controls, or continued record retention or continuing access, EPA will provide written notice to Respondents. If EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, EPA will notify Respondents, provide a list of the deficiencies, and require that Respondents modify the Work Plan if appropriate in order to correct such deficiencies. Respondents shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the EPA notice. Failure by Respondents to implement the approved modified Work Plan shall be a violation of this Settlement Agreement.

XXIX. INTEGRATION/APPENDICES

78. This Settlement Agreement and its appendices constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement.

XXX. EFFECTIVE DATE

79. This Settlement Agreement shall be effective 30 days after the Settlement Agreement is last signed by the Regional Administrator or his/her delegatee.

The undersigned representative(s) of Respondents certify(ies) that it (they) is (are) fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind the party(ies) it (they) represent(s) to this document.

Administrative Order on Consent EPA Region 8, Kennecott Utah Copper LLC, OM Enterprises Company and Kennecott Barneys Canyon Mining Company RE: Kennecott NE Stockton Property Site

Agreed this 16 day of June, 2009.

For Respondent Kennecott Utah Copper LLC

By [Signature]

Title Vice President of Projects and Value Generation

Agreed this 16 day of June, 2009.

For Respondent OM Enterprises Company

By [Signature]

Title Vice President Finance

Administrative Order on Consent EPA Region 8, Kennecott Utah Copper LLC, OM Enterprises Company and Kennecott Barneys Canyon Mining Company RE: Kennecott NE Stockton Property Site

Agreed this 16 day of June, 2009.

For Respondent Kennecott Barneys Canyon Mining Company

By [Signature]

Title CEO

It is so ORDERED and Agreed this 8th day of July, 2009.

BY: Michael T. Risner for for DATE: 7/8/09
Michael T. Risner
Director, Legal Enforcement Program,
Office of Enforcement, Compliance & Environmental Justice
Region 8
U. S. Environmental Protection Agency

BY: Kelcey Land DATE: 7/8/09
Kelcey Land
Acting Director, Technical Enforcement Program,
Office of Enforcement, Compliance & Environmental Justice
Region 8
U. S. Environmental Protection Agency

EFFECTIVE DATE: AUGUST 7, 2009

APPENDIX A
FORM OF ENVIRONMENTAL COVENANT

When Recorded Return To:

Kennecott Barneys Canyon Mining Company
c/o Kennecott Utah Copper LLC
Kelly Payne, Environmental Remediation Manager
P.O. Box 6001
Magna, UT 84044-6001

With Copies To:

Division Director
Division of Environmental Response and Remediation
Utah Department of Environmental Quality
168 North 1950 West
P. O. Box 144840
Salt Lake City, UT 84114-4840

and

Regional Institutional Control Coordinator, EPR-SR
U.S. Environmental Protection Agency
1595 Wynkoop Street
Denver, CO 80202

Parcel Nos. 06-020-0-0012, 06-020-0-0013, 01-184-0-0003, 01-185-0-0001, 01-185-0-0003, and all, or portions of, the following patented mining claims which lie substantially within Section 24, Township 4 South, Range 5 West, Salt Lake Base and Meridian, Tooele County, Utah, in the Rush Valley Mining District: Rush Amended Mineral Survey 5251, Hope M.S. 4946, Bellevue, Copper Queen Amended No. 2, Copper Queen No. 4 and Rush Lake, Mineral Survey No. 6152, Union Consolidated Mineral Survey 4983, North Star Lot 135, Gray Hound Amended Mineral Survey 5016, Bullion No. 3 Lot 44 and Parrot Mineral Survey 4748 lying within the E1/2 of the E1/2 of Section 24, Township 4 South, Range 5 West, Salt Lake Base and Meridian.

See Exhibit A for complete property descriptions and a map depicting the Property.

ENVIRONMENTAL COVENANT

This Environmental Covenant is entered into by Kennecott Barneys Canyon Mining Company ("Owner"), the United States Environmental Protection Agency ("EPA") and the Utah

Department of Environmental Quality (“DEQ”), (collectively “Parties”) pursuant to Utah Code Ann. §§ 57-25-101 et seq. (“Act”) and concerns the Property described in paragraph B.2 below. The DEQ and EPA each enter into this Environmental Covenant in their capacity as an Agency as defined in the Act. The DEQ and EPA assume no affirmative obligations through the execution of this Environmental Covenant.

A. Environmental Response Project

The Property is located east of Stockton, Tooele County, Utah, and is adjacent to the Jacobs Smelter Superfund Site. The Property is more particularly described in Exhibit A. The activity and use limitations are necessary because certain ephemeral drainages and related areas of the Property contain soils impacted with elevated levels of hazardous substances, primarily lead and arsenic. The impacted soils are the result of hazardous substances migrating onto the Property from higher elevation sources during surface water runoff events. It is not feasible to remove the impacted soils from the Property because hazardous substances are anticipated to continue to migrate onto the Property from higher elevation sources during future surface water runoff events. The impacted soils are enclosed by fencing to restrict access and potential human exposure to hazardous substances. The fencing includes signage to provide notice regarding the presence of impacted soils on the Property. Additional information is available in the files for the Kennecott NE Stockton Property, CERCLA Site ID # 08-PD, Stockton, Tooele County, Utah, at the DEQ offices and in the administrative record on file with EPA in Denver, Colorado at 1595 Wynkoop Street, Denver 80202-1129. EPA and the DEQ agree that it is in the best interests of the public to have notice of the presence of elevated levels of hazardous substances in the soils on the Property and to have limited use controls in place.

B. Covenant

Now therefore, the Parties agree to the following:

1. Environmental Covenant. This instrument is an environmental covenant developed and executed pursuant to the Act.
2. Property. This Environmental Covenant concerns approximately 81 acres of land located in Tooele County, Utah, known as the Kennecott NE Stockton Property, CERCLA Site #08-PD, and is more particularly described in Exhibit A attached hereto and hereby incorporated by reference herein (“Property”). The Property is depicted generally on the map attached with Exhibit A.
3. Owner. Kennecott Barneys Canyon Mining Company, a corporation organized and existing under the laws of Delaware, (“Owner”) is the owner of the Property in fee simple. Consistent with Paragraph 6 of this Environmental Covenant, the obligations of the Owner are

imposed on assigns, successors in interest, including without limitation future owners of an interest in fee simple, mortgagees, lenders, easement holders, lessees, and the like (“Transferee”).

4. Holder. Kennecott Utah Copper LLC, whose address is listed above, is the Holder of this Environmental Covenant.

5. Activity and Use Limitations. As part of the Environmental Response Project described above, the Owner hereby imposes and agrees to implement, administer, and maintain the following activity and use limitations. In the event the Owner conveys or transfers an interest in the Property or any portion thereof to another party, the Transferee shall assume the responsibility to implement, administer, and maintain the following activity and use limitations.

5.1 Owner shall maintain the perimeter fence, gates and signage at the Property consistent with the Administrative Settlement Agreement and Order on Consent for Removal Action, CERCLA Docket No. CERCLA-06-2009-0005, and the Access Control Construction and Maintenance Plan, Kennecott Stockton Northeast Property, incorporated thereto as Appendix D.

5.2 Prior to taking any action at the Property which might disturb and thus potentially cause a release of hazardous substances, Owner shall verify the presence or absence of heavy metals in soils in the areas to be disturbed. The “Trigger Level” for purposes of this Covenant is a surface (0 – 6 inches below ground surface) lead concentration greater than 500 ppm and subsurface lead concentrations greater than 800 ppm. Unless the sampling analysis indicates levels of heavy metals less than the Trigger Level, Owner and any and all Transferees agree to comply with Paragraph 5.3 herein. If the levels of heavy metals in the soils in and around the area to be disturbed are less than the Trigger Level as that term is defined herein, there are no limitations on the uses of the Property.

5.3 If heavy metals above the applicable Trigger Level are to be disturbed, Owner must appropriately protect workers and nearby receptors by controlling releases of heavy metals.

(a) Notification and Written Workplan – Prior to initiating any project on the Property which would disturb soils containing lead greater or equal to the Trigger Level, the Owner must submit and obtain written approval of a written workplan. The workplan must contain sufficient sampling and analysis to demonstrate the levels and locations of lead above the Trigger Level to be disturbed. The workplan shall be submitted to DEQ, EPA, and the local authority which grants building permits, and shall describe the nature of the project and the work practices and engineering controls to be used, the location of potential receptors and the steps Owner will take to cutoff the potential pathways and to prevent exposing workers, the public and

the environment. EPA and DEQ will coordinate to determine the appropriate level of government oversight and will notify the Owner which agency will be conducting oversight of the project. In the event any action or occurrence on or relating to the Property constitutes an emergency situation or which may present an immediate threat to public health or welfare or the environment, and prevents Owner from complying with the requirements of this paragraph, Owner shall immediately notify EPA and DEQ. The notification shall include details of the emergency situation and any immediate response actions needed.

(b) Existing Regulations – Any activity at the Property which disturbs the heavy metals above the Trigger Level should be conducted, at a minimum, in compliance with the then existing local, State and Federal regulations. The materials disturbed should be properly handled, transported and disposed of, in accordance with good work practices and then existing laws and regulations.

(c) Experienced Workforce - Owner shall utilize experienced and qualified workers.

(d) Oversight Costs - Owner shall timely pay DEQ and/or EPA for oversight and review in accordance with DEQ's and/or EPA's applicable fee schedule.

6. Running with the Land. This Environmental Covenant shall be binding upon the Owner and any Transferee during that person's period of control, occupation, or ownership interest, and shall run with the land, pursuant to the Act and subject to amendment or termination as set forth herein.

7. Compliance Enforcement. This Environmental Covenant may be enforced pursuant to the Act. Failure to timely enforce compliance with this Environmental Covenant or the activity and use limitations contained herein by any party shall not bar subsequent enforcement by such party, and shall not be deemed a waiver of the party's right to take action to enforce any non-compliance. Nothing in this Environmental Covenant shall restrict the DEQ or EPA from exercising any authority under applicable law.

8. Rights of Access. Owner hereby grants to EPA and the DEQ, including their agents, contractors, and employees, the right of access to the Property for inspection, implementation, or enforcement of this Environmental Covenant.

9. Compliance Reporting. Upon request, Owner or any Transferee or Holder shall submit written documentation to EPA and the DEQ verifying that the activity and use limitations remain in place and are being followed.

10. Notice upon Conveyance. Each instrument hereafter conveying any interest in the Property or any portion of the Property shall be substantially in the following form:

THE INTEREST CONVEYED HEREBY IS SUBJECT TO AN ENVIRONMENTAL COVENANT, DATED _____, 200_, RECORDED IN THE DEED OR OFFICIAL RECORDS OF THE _____ COUNTY RECORDER ON _____, 200_, IN [DOCUMENT _____, or BOOK _____, PAGE _____,]. THE ENVIRONMENTAL COVENANT CONTAINS THE FOLLOWING ACTIVITY AND USE LIMITATIONS: *[Insert verbatim the activity and use limitations exactly as they appear in Paragraph 5 herein.]*

Owner shall notify the DEQ and EPA within *twenty (20)* days after each conveyance of its interest in any portion of the Property. Owner's notice shall include the name, address, and telephone number of the Transferee, a copy of the deed, or other documentation evidencing the conveyance, and an unsurveyed plat that shows the boundaries of the property being transferred.

11. Representations and Warranties. Owner hereby represents and warrants to the other signatories hereto:

- A. that the Owner is the sole owner of the Property;
- B. that the Owner holds fee simple title to the Property;
- C. that the Owner has the power and authority to enter into this Environmental Covenant, to grant the rights and interests herein provided and to carry out all obligations hereunder;
- D. that the Owner has identified all other persons that own an interest in or hold an encumbrance on the Property, and notified such persons of the Owner's intention to enter into this Environmental Covenant; and
- E. that this Environmental Covenant will not materially violate or contravene or constitute a material default under any other agreement, document, or instrument to which Owner is a party or by which Owner may be bound or affected.

12. Amendment or Termination. This Environmental Covenant may be amended or terminated only by a written instrument duly executed by all of the following: the Owner or Transferee, EPA and DEQ, pursuant to Utah Code Ann. § 57-25-110 and other applicable law. Termination is appropriate if hazardous substances exceeding the Trigger Levels are removed pursuant to a work plan approved by EPA and/or DEQ prior to initiation of such work. The term, "Amendment," as used in this Environmental Covenant, shall mean any changes to the Environmental Covenant, including the activity and use limitations set forth herein, or the elimination of one or more activity and use limitations when there is at least one limitation

remaining. The term, "Termination," as used in this Environmental Covenant, shall mean the elimination of all activity and use limitations set forth herein and all other obligations under this Environmental Covenant. Within thirty (30) days of signature by all requisite parties on any amendment or termination of this Environmental Covenant, the Owner shall file such instrument for recording with the Tooele County Recorder's Office, and shall provide a file- and date-stamped copy of the recorded instrument to the DEQ and EPA.

13. Effective Date, Severability and Governing Law. The effective date of this Environmental Covenant shall be the date upon which the fully executed Environmental Covenant has been recorded as a document of record for the Property with the County Recorder. If any provision of this Environmental Covenant is found to be unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not in any way be affected or impaired. This Environmental Covenant shall be governed by and interpreted in accordance with the laws of the State of Utah.

14. Recordation and Distribution of Environmental Covenant. Within *thirty (30)* days after the date of the final required signature upon this Environmental Covenant, Owner shall file this Environmental Covenant for recording in the same manner as a deed to the Property, with the Tooele County Recorder's Office. The Owner shall distribute a file- and date-stamped copy of the recorded Environmental Covenant to: the DEQ; EPA; and the County of Tooele.

15. Notice. Unless otherwise notified in writing by or on behalf of the current owner or the DEQ or EPA, any document or communication required by this Environmental Covenant shall be submitted to:

The State of Utah:

Division Director
Division of Environmental Response and Remediation
Utah Department of Environmental Quality
168 North 1950 West
P.O. Box 144840
Salt Lake City, Utah 84114-4840

EPA:

Regional Institutional Control Coordinator, EPR-SR
U.S. EPA
1595 Wynkoop Street
Denver, CO 80202-1129

Owner:

Kennecott Barneys Canyon Mining Company
c/o Kennecott Utah Copper LLC
Environmental Remediation Manager
P.O. Box 6001
Magna, UT 84044-6001

Holder:

Kennecott Utah Copper LLC
Environmental Remediation Manager
P.O. Box 6001
Magna, UT 84044-6001

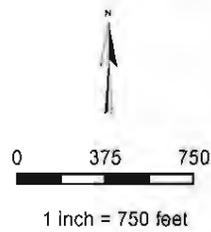
16. Governmental Immunity. In executing this covenant, the DEQ and EPA do not waive governmental immunity afforded by law. The Owner, for itself and its successors, assigns, and Transferees, hereby fully and irrevocably releases and covenants not to sue the State of Utah, its agencies, successors, departments, agents, and employees ("State") from any and all claims, damages, or causes of action arising from, or on account of the activities carried out pursuant to this Environmental Covenant except for an action to amend or terminate the Environmental Covenant pursuant to sections 57-25-109 and 57-25-110 of the Utah Code Ann. or for a claim against the State arising directly or indirectly from or out of actions of employees of the State that would result in (i) liability to the State of Utah under Section 63G-7-301 of the Governmental Immunity Act of Utah, Utah Code Ann. Section 63G-7-101 et seq. or (ii) individual liability for actions not covered by the Governmental Immunity Act as indicated in Sections 63G-7-202 and -902 of the Governmental Immunity Act, as determined in a court of law.

The undersigned representative of Owner represents and certifies that they are authorized to execute this Environmental Covenant.

[Signature Blocks on Subsequent Pages]



	NE ENVIRONMENTAL COVENANT AREA
	APPROXIMATE FENCE ALIGNMENT
	GATE
	SOIL W/ LEAD GREATER THAN 3000 mg/kg



RioTinto

EXHIBIT A ENVIRONMENTAL COVENANT NE PARCEL AOC	
ENVIRONMENTAL RESTRICTIONS CHECKLIST	
Drawing Number: E2000A_02_000	
Ryanne Scott Utah Copper	Date: 08/08/2018 Drawn by: JF Project No: 400 2018

EXHIBIT A

CERCLA Site #08-PD

LEGAL DESCRIPTIONS OF PROPERTY SUBJECT TO ENVIRONMENTAL COVENANT

All of the following described real property situated in **Section 24, Township 4 South, Range 5 West, Salt Lake Base & Meridian**

A. Those portions of **Section 24** described as follows:

1st: Beginning at the South Quarter Corner of Section 24; thence North 1320 feet, thence East 999.90 feet, thence South 1320 feet, thence West 999.90 feet to the point of beginning.

Tax ID No. 01-184-0-0003

2nd: Beginning at the Southwest Corner of the Northwest Quarter of the Southeast Quarter of Section 24; thence North 2043.70 feet, thence South 62°16' East 1129.67 feet, thence South 1518 feet, thence West 999.90 feet to the point of beginning.

Tax ID No. 01-185-0-0003

3rd: Beginning at the Southeast Corner of the Southwest Quarter of the Southeast Quarter of Section 24; thence West 320.10 feet, thence North 2838 feet, thence South 62°16' East 127.03 feet, thence North 29°29' East 333.40 feet, thence South 63°43' East 48.60 feet, more or less, to "40" line, thence South 2986.60 feet, more or less, to the point of beginning.

Tax ID No. 06-020-0-0012

4th: Beginning at a point 206.55 feet East of the Southwest Corner of the Northwest Quarter of the Northeast Quarter of Section 24; thence North 34°49' East 271.34 feet, thence South 65°46' East 97.1 feet, thence North 35°02' East 605.0 feet, thence South 62°06' East 589.3 feet, thence South 1316.6 feet, thence North 63°43' West 48.6 feet, thence South 29°29' West 333.4 feet, thence North 62°16' West 127.03 feet, thence North 1122.0 feet, thence West 793.35 feet to the point of beginning.

Tax ID No. 06-020-0-0013

5th: Beginning at a point 723.7 feet North of the center of Section 24, thence North 299.3 feet, thence North 34°49' East 361.76 feet, thence East 793.35 feet, to the Northeast Corner of the Stockton Town Boundary, thence South 1122.0 feet, thence North 62°16' West 1129.67 feet to the point of beginning.

Tax ID No. 01-185-0-0001

B. All, or portions of, those patented mining claims described below which lie substantially within **Section 24, Township 4 South, Range 5 West, Salt Lake Base and Meridian**, Tooele County, Utah, in the Rush Valley Mining District. Such property is also described as follows:

1st Beginning at the Northwest Corner of the Copper Queen No. 4 mining claim, MS 6152, thence approximately Northwest to the Southwest Corner of the Copper Queen Amended No. 2 mining claim, MS 6152, thence approximately North to the Northwest Corner of the Copper Queen Amended No. 2 mining claim, thence approximately Northwest to the Southwest Corner of the Bellevue mining claim, MS 6152, thence approximately North to the Northwest Corner of the Bellevue mining claim, thence approximately Southeast along the Northeast boundary line of the Bellevue mining claim to its intersection with the West boundary line of the Hope mining claim, MS 4946, thence approximately North to the Northwest Corner of the Hope mining claim, thence approximately North to the Northwest Corner of the Rush Amended mining claim, MS 5251, thence approximately 1,820 feet at a bearing of South 52° East to the intersection of the West boundary line of Section 19, Township 4 South, Range 4 West, SLB&M, and the North boundary line of the Union Consolidated mining claim, MS 4983 (which point is approximately 4,005 feet north of the Southwest corner of Section 19), thence approximately 676 feet South along the West boundary line of Section 19 to the intersection of the West boundary line of Section 19 and the South boundary line of the North Star mining claim, MS 135 (which point is approximately 3,329 feet north of the Southwest corner of Section 19), thence approximately 1,035 feet at a bearing of North 64° West to the Southwest Corner of the Union Consolidated mining claim, MS 4983, thence approximately 1,118 feet at a bearing of South 2° West to the Northwest Corner of the Copper Queen No. 4 mining claim, which is the point of beginning.

2nd Beginning at the Northwest Corner of the Copper Queen No. 4 mining claim, MS 6152, thence 400 feet approximately Southeast along the Northeast boundary line of the Copper Queen No. 4 mining claim, thence 679 feet due South to a point on the South boundary line of the Copper Queen No. 4 mining claim, thence 547 feet approximately Northwest to the Southwest corner of the Copper Queen No. 4 mining claim, thence approximately North to the Northwest Corner of the Copper Queen No. 4 mining claim, which is the point of beginning.

The above descriptions encompass all or a portion of each of the following mining claims:

<u>Claim Name</u>	<u>Mineral Survey No.</u>
North Star	135
Hope	4946
Union Consolidated	4983
Rush Amended	5251
Bellevue, Copper Queen Amended No. 2, and Copper Queen No. 4,	6152

**APPENDIX B
ACTION MEMO**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 8

1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
<http://www.epa.gov/region08>

Ref: 8EPR-SA

ACTION MEMORANDUM

SUBJECT: Enforcement – Lead Time-Critical Removal Action for the Kennecott NE Stockton Property Site, Tooele County, Utah.

FROM: Duc Nguyen, On-Scene Coordinator
Emergency Response Unit

Handwritten signature of Duc Nguyen in black ink.

THROUGH: Curtis Kimbel, Supervisor
Emergency Response Unit

Handwritten signature of Curtis Kimbel in black ink.

TO: David A. Ostrander, Director
Preparedness, Assessment and Emergency Response Program

Site ID #: 08PD
CERCLIS ID #: UTN000802693
Category of Removals: Time Critical, Enforcement -Lead

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed Enforcement-Lead Time Critical Removal Action (TCRA) for the Kennecott NE Stockton Property Site (Site) located in Tooele County, Utah. The Removal action discussed herein will be conducted pursuant to and within the context of an Administrative Settlement Agreement and Order on Consent for Removal Action (Settlement Agreement). This Settlement Agreement is entered voluntarily by the United States Environmental Protection Agency (EPA) and the Potentially Responsible Parties (PRPs) – Kennecott Utah Copper Corporation and its wholly owned subsidiary, OM Enterprises Company ('KUCC').

In accordance with determinations for the appropriateness of a Removal Action as specified in the National Contingency Plan (NCP), Section 300.415(b)(2), the Removal Action addresses the actual or potential exposure of human populations to hazardous substances, pollutants, or contaminants that may migrate.

The proposed Enforcement Removal Action will manage the risk of potential exposures to lead and arsenic contaminated soils through implementation and maintenance of engineering and institutional controls (IC's). The risk of contamination from uncontrolled sources needs to be managed instead of removed because site investigations have indicated that most of the

source of contamination is uncontrolled, offsite and up-gradient of the Site and thus could readily re-contaminate the Site.

II. SITE CONDITIONS AND BACKGROUND

The CERCLIS ID number for the Site is UTN000802693. The Site is situated near the north eastern most part of the Jacobs Smelter Superfund Site (CERCLIS ID No. UT0002391472). Site conditions are such that this Removal Action is classified as Time Critical. The Site is located at the base of the west side of the Oquirrh Mountains within Rush Valley, Tooele County, immediately northeast of the town of Stockton, Utah. This Site is in close proximity to the area known as the Jacobs Smelter Superfund Site (Jacobs Site) that contains at least four (4) historical smelters which were operational during the latter half of the 19th century.

With the passage of time, waste materials from the now defunct smelters were deposited across a large area primarily by wind and water transport. The waste materials from the historical smelting activities contain heavy metals, such as lead and arsenic that are found in portions of the Jacobs Site soil.

Both human health and ecological risk assessments were completed at the Jacob's Site. The property subject to those risk assessments include the property covered by this Action Memorandum. The Risk Assessments are presently available in the Jacobs Smelter Superfund Site Administrative Record in Stockton, Utah, at the same location where the public information repository for this Site will reside.

The entire Jacob's Site was originally identified in 1997. Pursuant to the National Contingency Plan (NCP), 40 CFR §415(b) and 42 U.S.C. §9605, the Jacob's Site was proposed for listing on the National Priority List (NPL) in 1999. OU2 of the Jacob's Site encompasses the contaminated soils and other media outside of the town of Stockton and is comprised of mostly undeveloped lands (1440 acres).

The area subject to this TCRA is disassociated from the Jacobs Smelter NPL Site.

A. Site Description

1. Physical Location

The town of Stockton is located in the north-central part of Utah, approximately five miles south of the city of Tooele. The Kennecott NE Stockton Property Site is located northeast of the town of Stockton, in a portion of Section 24, T4S, R5W, and east of State Highway 36 (Figure 1-1, KUCC East and West Parcels).

2. Site Characteristics

The Site is northeast of Stockton at the base of the west side of the Oquirrh Mountains. In the late 1800's there were at least four smelters active in the proximity of Stockton and numerous mine activities in the Oquirrh Mountains. Waste materials

containing elevated levels of heavy metals from the area smelters contaminated nearby soils. Heavy metal waste materials appear as far as the lower reaches of the Oquirrh Mountains. Investigations indicate the presence of arsenic, cadmium, copper, lead, mercury, and zinc in the soils. The primary contaminants are lead and arsenic. The Kennecott NE Stockton Property, due to its location and the adjacent topography appears to have been contaminated by uncontrolled sources located up-gradient that appear to contaminate the Site via transportation of contaminated waste deposited along naturally occurring and man-made drainages.

3. Removal Site Evaluation

The Site encompasses approximately 81 acres. Several sampling investigations have been conducted at the Site by the Utah Department of Environmental Quality (UDEQ) in cooperation with EPA. The Site was originally investigated as part of OU2 Jacob's Site. The OU2 Remedial Investigation (RI) was completed and a Proposed Plan issued in July 2004, but a Record of Decision (ROD) has not been issued.

In July 2004, KUCC voluntarily conducted site characterization and sampling studies at the Site in order to better define the nature and extent of the contamination. They collected eighty-seven soil samples from twenty-six locations. The maximum lead concentration for those samples is 24,800 mg/kg (ppm). Samples containing elevated lead were found between 0 to 7 inches below surface and in either a drainage bottom or an area where deposition of sediments (Figure 2-1, Stockton Northeast Area – 2004 Soil Characterization Investigation Sample Locations).

In December 2007, EPA requested that KUCC collect additional soil samples along with the location of both the natural and man-made drainages to define the horizontal and vertical limits of the contaminated soil on the Site. Sample collection began in July 2008 at both northern and southern contamination areas (Figure 3, Stockton Northeast Area Sample Locations and Highest Lead Concentrations).

- Southern Contamination Area: Lead concentration ranged from 3,010 mg/kg to 64,100 mg/kg. Arsenic concentrations ranged from 27 mg/kg to 1,690 mg/kg. The depth of contaminated soil ranges from 2 inches to 28 inches below the surface.
- Northern Contamination Area: Lead concentration ranged from 3,170 mg/kg to 11,100 kg/kg. Arsenic concentration ranged from 30 mg/kg to 743 mg/kg. The depth of contamination ranges from 2 inches to 27 inches below the surface (Table 1, Sampling and Total Lead and Arsenic Analytical Data for Soil Characterization Samples).

The elevated levels of lead and arsenic were found in water deposited and bedded alluvium that is associated with natural or man-made drainages. The data strongly suggests that the contamination is from up-gradient uncontrolled mine sources outside of both the Jacob's Site and this Site's boundaries. Since the up-gradient sources are uncontrolled, cleaning up the Site contamination could lead to recontamination through storm events. Additionally, the current contamination appears to be

contained within specific drainages and associated alluvium. A clean up would alter the Site topography and could potentially lead to contamination of new areas during subsequently reoccurring storm events. Thus, the Site contamination will be managed through the use of engineering and institutional controls.

3. Release or Threatened Release into the Environment of Hazardous Substances, or Pollutant or Contaminant

In the heavy metal waste material found in this area, lead and arsenic are the primary contaminants of concern with regard to human health. Lead and arsenic are hazardous substances as defined by CERCLA Section 101(14). Past and present releases occur by means by wind and water transportation. Lead and arsenic contaminated waste is transported via natural and manmade drainages to locations down gradient of the source.

The exposure to these metals poses an unacceptable risk to human health and/or the environment as shown by the risk assessments done for the Jacobs Smelter Site.

4. NPL Status

The Site is not on the NPL, nor proposed for listing.

B. Other Actions to Date

1. Previous Actions

Actions to date on this Site consist of the Jacobs Smelter Superfund Site RI sampling and an independent Kennecott Utah Copper Corporation (Kennecott) voluntarily conducted investigation and sampling in July 2004 and 2008. These sampling events indicated elevated levels of lead and arsenic on the Site. However, it was not until the 2008 sampling event that levels as high as 67,400 mg/kg of lead were found. (Characterization and Source Assessment for Kennecott Stockton Northeast Parcel Report, Table 8-1, Sampling and Total Lead and Arsenic Analytical Data, Kennecott December 2008).

2. Current Actions

Work required by this Action Memorandum will be conducted under an Administrative Settlement Agreement and Order on Consent for Removal Action (Settlement Agreement) with Kennecott Utah Copper Corporation and its wholly owned subsidiary OM Enterprises, Company (Respondents). **The Order requires a Work Plan to be developed, submitted and approved by EPA prior to initiation of work by the Respondents.**

C. State and Local Authorities' Roles

UDEQ has been briefed on the actions outlined in this Action Memorandum and both their legal and technical divisions have concurred. UDEQ was the lead on the Jacobs Site RI investigations.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Based on the known presence at the Site of lead levels as high as 67,400 mg/kg, conditions at the Site warrant initiating a Removal Site Evaluation and Removal Action under NCP § 40 300.415 (b)(2). These levels were determined to be elevated given numerous factors, including background conditions.

A. Threats to Public Health and or Welfare

NCP §300.415 (b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants and §300.415 (b) (2) (iv) - High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

The Jacob's Site OU2 risk assessment indicated that lead levels above 10,000 mg/kg are a potential concern for recreational users or trespassers. Several dirt roads cross the property, including a county road and the area is known to be used by recreational users. The KUCC sampling showed lead concentrations as high as 64,100 mg/kg, which is six times the recreational risk based remediation goal.

NCP §300.415(b) (2) (vii) - The availability of other appropriate federal or state response mechanisms to respond to the release.

There are no other federal or state response mechanisms available to conduct this removal in a timely manner.

B. Threats to the Environment

NCP §300.415 (b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants and 300.415 (b) (2) (iv) High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.

Although there is a potential risk to ecological receptors from elevated levels of lead, the human health risk is driving this removal action.

IV. ENDANGERMENT DETERMINATION

Actual and/or threatened releases of hazardous substances or contaminants from this Site, if not addressed by implementing the response described in this Action Memorandum, may present an imminent and substantial endangerment to public health or welfare and/or the environment. Known endangerment is stated to exist based on data included in the Kennecott 2008 investigation,

Arsenic is a hazardous substance as defined by Section 101(4) of CERCLA and is a known human carcinogen. It is also poisonous by subcutaneous and intramuscular routes. Large doses of arsenic may be fatal. Chronic exposure to arsenic generally results in skin lesions, liver injury and peripheral vascular disease. At lower doses, ingestion will induce adverse systematic skin reaction and gastrointestinal effects.

Lead is classified as a B2 human carcinogen by EPA. This classification is the result of animal studies determining that these compounds are probable human carcinogens. Lead can enter the body by ingestion and inhalation. Children appear to be the segment of the population at the greatest risk from toxic effects of lead. The most serious effects associated with markedly elevated blood lead levels include neurotoxic effects such as irreversible brain damage.

This action will greatly reduce potential risk to human health from exposure to hazardous substances (arsenic and lead) present at the site by a combination of engineering and institutional controls to limit and severely restrict human access to the Site. The area will be fenced and signs posted to limit access to the Site. The fencing will be placed in a manner that allows access to current roads through the site but prevents trespassers or recreational users from crossing the areas of elevated lead and arsenic. An Environmental Covenant and Institutional Control, per the Settlement Agreement, will also be placed on this property to maintain the integrity of the remedy and to ensure future compliance with the restrictions placed on the Site.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Action Description

The objectives of this Removal Action are to:

- Prevent human exposures to lead and arsenic concentrations above risk-based recreational levels;
- Assure that if the land use changes, human exposures above appropriate risk based levels will be prevented; and
- Assure that if ownership changes, appropriate notice about the contamination and the requirements for on-going management and engineering controls will be incorporated into the property deed(s).

The work will be consistent with applicable or relevant and appropriate requirements (ARARs) as required by the Settlement Agreement. The plan includes:

- fencing of all areas where lead concentrations are above recreational risk-based levels of 10,000 mg/kg;
- posting of signs warning of the hazard and providing a phone number for additional information;
- routine inspection and maintenance of fencing and signs; and
- recording of an Environmental Covenant and Institutional Control (per Utah law) on the property.

2. Contribution to Remedial Performance

This removal action will be the only action of this property under the current use or until up-gradient contamination is addressed.

3. Description of Alternative Technologies

No alternative technologies were considered practical or appropriate for this work.

4. Engineering Evaluation/Cost Analysis (EE/CA)

An EE/CA is not required for this action because the planning period for the action is less than six months.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

This removal action will attain, to the extent practicable, Federal and/or State ARARs, whichever are more stringent. ARARs will be identified as part of the work under the Settlement Agreement.

6. Project Schedule

It is anticipated that the Removal Action can be initiated immediately after the Settlement Agreement with Respondents has been reached. The field work will be conducted as soon as weather conditions allow for the proper installation of the fencing, likely in May 2009 prior to the recreational season.

B. Estimated Costs

The cost of the removal will be borne by Kennecott, including oversight costs. Oversight cost is expected to be less than \$20,000. Total cost of the project should be less than \$100,000.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If no removal action is taken, or if the action is delayed, potential exposures at the Site will continue to be uncontrolled.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

Enforcement considerations and strategies are discussed in the separate confidential enforcement addendum.

IX. RECOMMENDATION

This decision document represents the selected Enforcement Removal Action at Kennecott NE Stockton Property Site, located near Stockton, Tooele County, Utah, developed in accordance with CERCLA, as amended, and not inconsistent with the NCP

Conditions at the locations based on all present information meet the NCP Section §300.415(b)(2) criteria for a removal. I recommend your approval of the proposed Enforcement Removal Action.

APPROVAL



David A. Ostrander, Director
Preparedness, Assessment and Emergency Response Program

3/31/09
Date

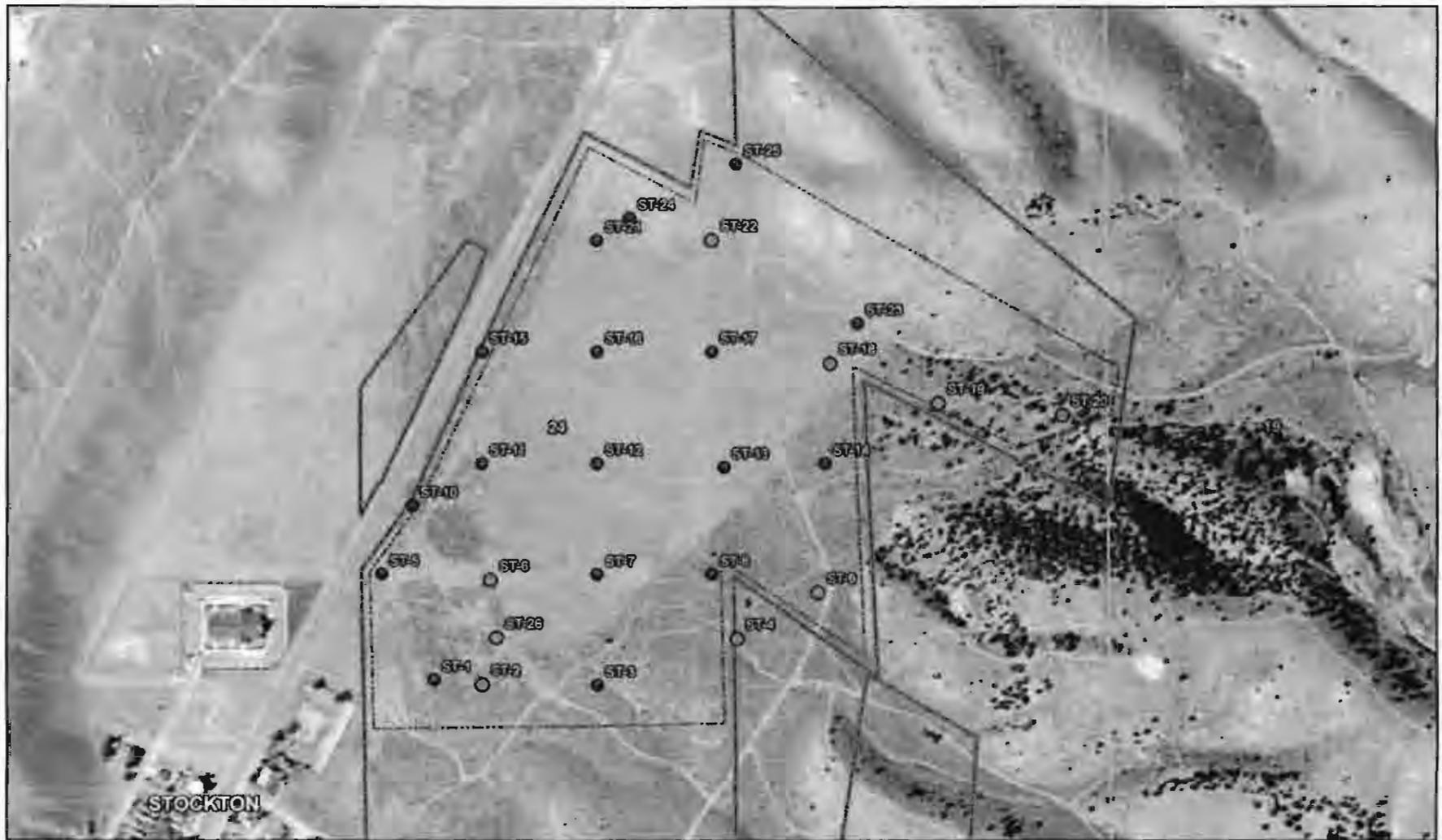
DISAPPROVAL

David A. Ostrander, Director
Preparedness, Assessment and Emergency Response Program

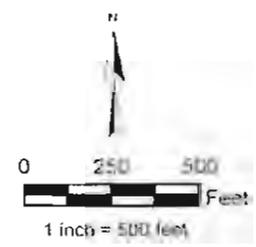
Date

Attachments:

- Figure 1-1: KUCC East and West Parcels
- Figure 2-1: Stockton Northeast Area – 2004 Soil Characterization Investigation Sample Locations
- Table 1: Characterization and Source Assessment for Kennecott Stockton Northeast Parcel Report, Table 8-1, Sampling and Total Lead and Arsenic Analytical Data.



- 2004 CHARACTERIZATION < 3000 LEAD
- ⊙ 2004 CHARACTERIZATION > 3000 LEAD
- ▭ KUCC PROPERTY BOUNDARY
- - - STOCKTON NORTHEAST INVESTIGATION AREA



PROLOGIC	FIGURE 2-1 STOCKTON NORTHEAST AREA 2004 SOIL CHARACTERIZATION INVESTIGATION SAMPLE LOCATIONS	
	ENVIRONMENTAL RESTORATION GROUP, P.C.	
	Drawing Number: 454-T-0371	
		Date: 11/2009 Drawn By: J. Project Mgr.: RP Rev:

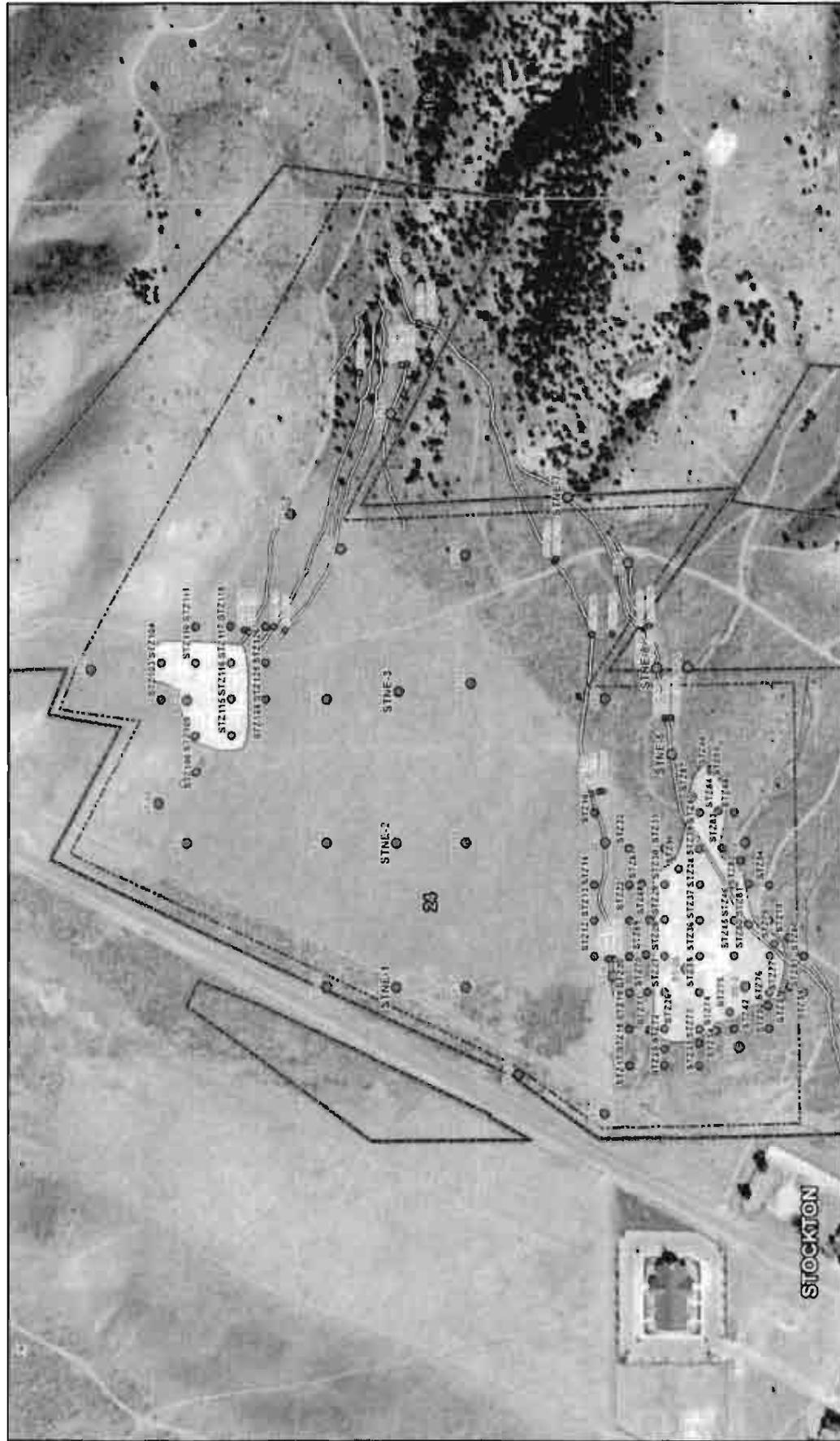


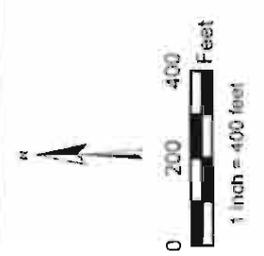
FIGURE 3
STOCKTON NORTHEAST AREA
SAMPLE LOCATIONS AND ID NUMBERS
2004 AND 2008 CHARACTERIZATIONS

ENVIRONMENTAL
REGISTRATIONS GROUP II

Drawing Number: 454-T-2573

Drawn: 1/2008
 Drawn By: J
 Project Mgr: KP

Environmental
 Group II



- SAMPLE LOCATION AND ID NO. 2004 CHARACTERIZATION
- SAMPLE LOCATION AND ID NO. 2008 CHARACTERIZATION
- AT LEAST ONE SAMPLE CONTAINS >3000 mg/kg LEAD
- ALL SAMPLES CONTAIN <3000 mg/kg LEAD
- AREAS CONTAINING <3000 mg/kg LEAD
- MAN-MADE OR NATURAL DRAINAGE THAT RECEIVED MINE WATER
- NATURAL DRAINAGE

Table 1

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-12-1	AQ11718	7/21/2008	0-2	Silty sandy gravel. No discoloration.	658	33
STZ-12-2	AQ11719	7/21/2008	2-6	Silty sandy gravel. No discoloration.	397	29
STZ-12-3	AQ11720	7/21/2008	6-12	Silty sandy gravel. No discoloration.	362	18
STZ-12-4	AQ11721	7/21/2008	12-18	Silty sandy gravel. No discoloration.	707	41
STZ-13-1	AQ11722	7/21/2008	0-2	Silty sandy gravel. No discoloration.	930	38
STZ-13-2	AQ11723	7/21/2008	2-6	Silty sandy gravel. No discoloration.	506	24
STZ-13-3	AQ11724	7/21/2008	6-12	Silty sandy gravel. No discoloration.	471	35
STZ-13-4	AQ11725	7/21/2008	12-18	Silty sandy gravel. No discoloration.	641	31
STZ-14-1	AQ11833	7/23/2008	0-2	Gravelly silt. No discoloration.	958	49
STZ-14-2	AQ11834	7/23/2008	2-6	Gravelly silt. No discoloration.	372	25
STZ-14-3	AQ11835	7/23/2008	6-12	Gravelly silt. No discoloration.	341	16
STZ-14-4	AQ11836	7/23/2008	12-18	Gravelly silt. No discoloration.	315	16
STZ-15-1	AQ11837	7/23/2008	0-2	Gravelly silt. No discoloration.	465	24
STZ-15-2	AQ11838	7/23/2008	2-6	Gravelly silt. No discoloration.	332	19
STZ-15-3	AQ11839	7/23/2008	6-12	Gravelly silt. No discoloration.	373	20
STZ-15-4	AQ11840	7/23/2008	12-18	Gravelly silt. No discoloration.	360	30
STZ-16-1	AQ11841	7/23/2008	0-2	Gravelly silt. No discoloration of sample material but there is some discoloration on surface gravel in vicinity of the sample site.	406	24
STZ-16-2	AQ11842	7/23/2008	2-6	As above.	352	21
STZ-16-3	AQ11843	7/23/2008	6-12	As above.	304	18
STZ-16-4	AQ11844	7/23/2008	12-18	As above.	311	17
STZ-17-1	AQ11895	7/24/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	772	33
STZ-17-2	AQ11896	7/24/2008	2-8	Topsoil: Gravelly sandy silt. No discoloration.	342	18

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-17-3	AQ11897	7/24/2008	8-16	Sandy silt. No discoloration.	295	16
STZ-18-1	AQ11110	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	375	19
STZ-18-2	AQ11111	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	344	19
STZ-18-3	AQ11112	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	303	15
STZ-18-4	AQ11113	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	312	14
STZ-19-1	AQ11114	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	402	26
STZ-19-2	AQ11115	7/10/2008	2-6	Gravelly silt. No discoloration.	302	20
STZ-19-3	AQ11116	7/10/2008	6-12	Gravelly silt. No discoloration.	269	18
STZ-19-4	AQ11117	7/10/2008	12-18	Gravelly silt. No discoloration.	300	17
STZ-20-1	AQ11118	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	466	23
STZ-20-2	AQ11119	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	487	23
STZ-20-3	AQ11120	7/10/2008	6-12	Gravelly silt. No discoloration.	404	21
STZ-20-4	AQ11121	7/10/2008	12-18	Gravelly silt. No discoloration.	338	22
STZ--21-1	AQ11089	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	681	31
STZ--21-2	AQ11090	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	355	22
STZ--21-3	AQ11091	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	324	18
STZ-22-1	AQ11092	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	982	37
STZ-22-2	AQ11093	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	333	19
STZ-22-3	AQ11094	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	293	15
STZ-23-1	AQ11095	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	586	26
STZ-23-2	AQ11096	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	403	22
STZ-23-3	AQ11097	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	447	18
STZ-25-1	AQ11898	7/24/2008	0-2	Sandy silt. No discoloration.	2400	115
STZ-25-2	AQ11899	7/24/2008	2-6	Sandy silt. No discoloration.	582	51
STZ-25-3	AQ11900	7/24/2008	6-11	Sandy silt. No discoloration.	130	11

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-25-4	AQ11901	7/24/2008	11-18	Gravelly sandy silt. No discoloration.	379	22
STZ-26-1	AQ11122	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	12300	508
STZ-26-2	AQ11123	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	10600	382
STZ-26-3	AQ11124	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	1410	56
STZ-26-4	AQ11125	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	394	19
DDEDIT	AQ11126	7/10/2008	0-2	Topsoil: Gravelly sandy silt. Discolored (Fe-ox) soil 4"-6".	12500	934
DDEDIT	AQ11127	7/10/2008	2-6	Topsoil: Gravelly sandy silt. Discolored (Fe-ox) soil 4"-6".	35500	922
STZ-27-3	AQ11128	7/10/2008	6-12	Silty sandy gravel. Soil is locally discolored (Fe-ox).	19800	813
STZ-27-4	AQ11129	7/10/2008	12-18	Gravelly sandy silt. Locally discolored (Fe-ox).	5990	226
STZ-27-5	AQ13234	8/14/2008	18-28	Silty gravel. Discoloration to 28 inches.	389	23
STZ-28-1	AQ11098	7/10/2008	0-2	Topsoil: silty gravelly sand. Very weak orange-brown (Fe-ox) discoloration. Surface soil in vicinity of sample site has Fe-oxidized gravel.	45900	1010
STZ-28-2	AQ11099	7/10/2008	2-9	Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration.	64000	1180
STZ-28-3	AQ11100	7/10/2008	9-18	Gravelly sandy silt. No discoloration.	440	18
STZ-29-1	AQ11015	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration throughout this interval.	16700	611
STZ-29-2	AQ11016	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration throughout this interval.	42600	905
STZ-29-3	AQ11017	7/9/2008	6-10	6"-8": Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration. 8"-10": Gravelly sand with weak orange-brown (Fe-ox) discoloration. Fair to well sorted water deposited gravel. Gravel is less than 0.5" dia.	64100	1690

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-29-4	AQ11018	7/9/2008	10-18	Sandy silt. No discoloration. Massive. Appears to be undisturbed native soil.	1660	43
STZ-30-1	AQ11023	7/9/2008	0-2	Topsoil: Sandy silt. No discoloration.	3110	176
STZ-30-2	AQ11024	7/9/2008	2-12	Sandy silt. Massive. Small pod of orange-brown soil at 10".	8050	346
STZ-30-3	AQ11025	7/9/2008	12-18	Sandy silt. No discoloration.	497	26
STZ-31-1	AQ11019	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown discoloration.	789	32
STZ-31-2	AQ11020	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown discoloration.	391	23
STZ-31-3	AQ11021	7/9/2008	6-12	Gravelly silty sand. No discoloration.	363	20
STZ-31-4	AQ11022	7/9/2008	12-18	Gravelly silty sand. No discoloration.	359	22
STZ-32-1	AQ13193	8/14/2008	0-2	Gravelly sandy silt. No discoloration.	1570	50
STZ-32-2	AQ13194	8/14/2008	2-8	Gravelly sandy silt. No discoloration.	335	18
STZ-32-3	AQ13195	8/14/2008	8-18	Gravelly silty sand. Weak caliche in matrix. Appears to be undisturbed native soil.	314	18
STZ-33-1	AQ11902	7/24/2008	0-2	Silty sandy gravel. No discoloration.	567	33
STZ-33-2	AQ11903	7/24/2008	2-6	Silty sandy gravel. No discoloration.	141	20
STZ-33-3	AQ11904	7/24/2008	6-11	Silty sandy gravel. No discoloration.	163	23
STZ-33-4	AQ11905	7/24/2008	11-18	Silty sandy gravel. No discoloration.	216	25
STZ-34-1	AQ11223	7/11/2008	0-2	Topsoil: Gravelly silty sand. No discoloration.	7640	835
STZ-34-2	AQ11224	7/11/2008	2-6	Silty gravelly sand. No discoloration.	728	67
STZ-34-3	AQ11225	7/11/2008	6-13	Silty gravelly sand. No discoloration.	469	41
STZ-34-4	AQ11226	7/11/2008	13-21	Sandy silt. No discoloration.	648	53

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-34-5	AQ11227	7/11/2008	21-24	Clayey silt. Appears to be water deposited sediment. Bedding planes visible. Medium green with orange-brown (Fe-ox) along bedding planes.	11300	873
STZ-34-6	AQ13232	8/14/2008	24-30	Gravelly clayey silt. No discoloration.	218	13
STZ-35-1	AQ11228	7/11/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	2200	101
STZ-35-2	AQ11229	7/11/2008	2-12	Silty gravelly sand. No discoloration.	174	19
STZ-35-3	AQ11230	7/11/2008	12-18	Silty gravelly sand from 12"-16". No discoloration. 16"-18" Sandy silt. No discoloration.	210	19
STZ-36-1	AQ11026	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	7280	661
STZ-36-2	AQ11027	7/9/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	1660	152
STZ-36-3	AQ11028	7/9/2008	6-12	Gravelly sandy silt. No discoloration.	176	22
STZ-36-4	AQ11029	7/9/2008	12-18	Gravelly sandy silt. No discoloration.	163	16
STZ-37-1	AQ11030	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown (Fe-ox) discoloration.	4830	226
STZ-37-2	AQ11031	7/9/2008	2-12	2"-6" Topsoil: Gravelly sandy silt. Possibly very weak orange-brown (Fe-ox) discoloration. 6"-12" Sandy silt. No discoloration.	200	20
STZ-37-3	AQ11032	7/9/2008	12-18	12"-17" Sandy silt. No discoloration. 17"-18" Silty sandy gravel. No discoloration.	236	17
STZ-38-1	AQ11033	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Very weak orange-brown discoloration.	10500	560
STZ-38-2	AQ11034	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Very weak orange-brown discoloration.	2010	62
STZ-38-3	AQ11035	7/9/2008	6-12	Gravelly sandy silt. No discoloration.	387	22
STZ-38-4	AQ11036	7/9/2008	12-18	Gravelly sandy silt. No discoloration.	330	19

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	REL. ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-39-1	AQ11037	7/9/2008	0-2	Topsoil: Gravelly silty sand: Weak orange-brown (Fe-ox).	12000	785
STZ-39-2	AQ11038	7/9/2008	2-8	2"-3" Water deposited sandy gravel. Gravel is fine. Discolored orange-brown. 3"-8" Fine, well sorted gravel (<0.5" dia.). Water sorted. Weak orange-brown discoloration throughout. Sharp lower contact.	11900	956
STZ-39-3	AQ11009	7/9/2008	8-11	Sandy gravel. Fine gravel in a sand matrix. Weak orange discoloration.	7300	286
STZ-39-4	AQ11010	7/9/2008	11-18	Sandy gravel. Well sorted fine gravel in a coarse sand matrix. Weak orange discoloration.	8190	349
STZ-39-5	AQ13196	8/14/2008	18-28	Gravelly silty sand. No discoloration.	2700	85
STZ-40-1	AQ11234	7/11/2008	0-2	Topsoil: Silty gravelly sand. No discoloration of sampled soil but there is abundant Fe-stained gravel on the surface within 50' to 75' around the sample site. Some of this surface gravel is strongly iron stained and may be waste rock.	33900	543
STZ-40-2	AQ11235	7/11/2008	2-5	As above.	4490	78
STZ-40-3	AQ11236	7/11/2008	5-18	Silty sandy gravel. No discoloration.	4040	72
STZ-40-4	AQ13197	8/14/2008	18-24	Silty sandy gravel. Strong caliche on gravel clasts and in matrix. No discoloration. Appears to be undisturbed native soil.	103	16
STZ-42-1	AQ11001	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	217	15
STZ-42-2	AQ11002	7/9/2008	2-7	Topsoil: Gravelly sandy silt. No discoloration.	141	14
STZ-42-3	AQ11003	7/9/2008	7-12	Gravelly sandy silt. No discoloration.	155	15
STZ-42-4	AQ11004	7/9/2008	12-18	Sandy gravelly silt. No discoloration.	148	15
STZ-43-1	AQ11005	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	3440	150

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-43-2	AQ11006	7/9/2008	2-6	As above.	4140	178
STZ-43-3	AQ11007	7/9/2008	6-12	Sandy silty gravel. No discoloration.	365	22
STZ-43-4	AQ11008	7/9/2008	12-18	Sandy gravelly silt. No discoloration.	231	17
STZ-44-1	AQ11130	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	4470	156
STZ-44-2	AQ11131	7/10/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	3200	113
STZ-44-3	AQ11132	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	283	20
STZ-44-4	AQ11133	7/10/2008	12-18	Sandy gravelly silt. No discoloration.	170	12
STZ-45-1	AQ11011	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	7510	281
STZ-45-2	AQ11012	7/9/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	4870	186
STZ-45-3	AQ11013	7/9/2008	6-12	Sandy silt. Massive.	9470	279
STZ-45-4	AQ11014	7/9/2008	12-18	Sandy silt. Massive.	3520	106
STZ-45-5	AQ13995	8/28/2008	18-28	Sandy gravelly silt. Caliche coating on gravel clasts.	298	22
STZ-46-1	AQ11231	7/11/2008	0-2	Topsoil: Gravelly sandy silt. Site is located in a drainage bottom. No discoloration.	6740	388
STZ-46-2	AQ11232	7/11/2008	2-8	Sandy gravel (recent alluvium) Sharp lower contact. No discoloration.	14800	692
STZ-46-3	AQ11233	7/11/2008	8-18	8"-16" Silty gravelly sand. Appears to be undisturbed native soil. No discoloration. 16"-18" Sandy silt.	7790	252
STZ-46-4	AQ13198	8/14/2008	18-28	Sandy silt. No discoloration.	4720	149
STZ-46-5	AQ13994	8/28/2008	28-38	As above.	516	24
STZ-47-1	AQ11726	7/21/2008	0-2	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	379	33
STZ-47-2	AQ11727	7/21/2008	2-6	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	707	35

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-47-3	AQ11728	7/21/2008	6-12	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	793	34
STZ-47-4	AQ11729	7/21/2008	12-18	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	292	21
STZ-48-1	AQ11821	7/23/2008	0-2	Gravelly silt. Weak discoloration of surface soil in vicinity of sample site.	190	19
STZ-48-2	AQ11822	7/23/2008	2-6	As above.	128	12
STZ-48-3	AQ11823	7/23/2008	6-12	As above.	134	12
STZ-48-4	AQ11824	7/23/2008	12-18	As above.	194	18
STZ-50-1	AQ11107	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	871	60
STZ-50-2	AQ11108	7/10/2008	2-12	2"-5" gravelly sandy silt. No discoloration. 5"-12" Silty gravelly sand. Appears to be undisturbed native soil.	170	18
STZ-50-3	AQ11109	7/10/2008	12-18	Sandy gravel. Gravel is caliche coated.	208	20
STZ-51-1	AQ11101	7/10/2008	0-2	Topsoil: Gravelly silty sand. No discoloration.	3010	108
STZ-51-2	AQ11102	7/10/2008	2-7	As above.	113	16
STZ-51-3	AQ11103	7/10/2008	7-18	7"-14" Sandy silt. Massive. Appears to be undisturbed native soil. No discoloration. 14"-18" Gravelly sandy silt. Gravel is caliche coated. No discoloration.	92	15
STZ-52-1	AQ11104	7/10/2008	0-2	Topsoil: Silty gravelly sand. Possibly very weak orange-brown discoloration.	98	16
STZ-52-2	AQ11105	7/10/2008	2-11	Sandy gravel. Gravel is well sorted (1/8 to 1/2 inch dia.). No discoloration.	1500	238
STZ-52-3	AQ11106	7/10/2008	11-18	Sandy silt. No discoloration.	6720	355
STZ-52-4	AQ13233	8/14/2008	18-25	Sandy silty gravel. No discoloration.	101	15
STZ-53-1	AQ11825	7/23/2008	0-2	Gravelly silt. No discoloration.	887	45

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-53-2	AQ11826	7/23/2008	2-6	Gravelly silt. No discoloration.	279	23
STZ-53-3	AQ11827	7/23/2008	6-12	Gravelly silt. No discoloration.	107	16
STZ-53-4	AQ11828	7/23/2008	12-18	Gravelly silt. No discoloration.	105	13
STZ-54-1	AQ11829	7/23/2008	0-2	Gravelly silt. No discoloration.	185	17
STZ-54-2	AQ11830	7/23/2008	2-6	Gravelly silt. No discoloration.	127	21
STZ-54-3	AQ11831	7/23/2008	6-12	Gravelly silt. No discoloration.	117	15
STZ-54-4	AQ11832	7/23/2008	12-18	Gravelly silt. No discoloration.	140	35
STZ-59-1	AQ11906	7/24/2008	0-2	Silty gravelly sand. No discoloration.	721	39
STZ-59-2	AQ11907	7/24/2008	2-6	Silty gravelly sand. No discoloration.	564	34
STZ-59-3	AQ11908	7/24/2008	6-12	Silty gravelly sand. No discoloration.	263	22
STZ-59-4	AQ11909	7/24/2008	12-18	Silty sandy gravel. Strong caliche cement. No discoloration.	278	17
STZ-60-1	AQ11910	7/24/2008	0-2	Silty gravelly sand. No discoloration.	2000	89
STZ-60-2	AQ11911	7/24/2008	2-6	Silty gravelly sand. No discoloration.	221	20
STZ-60-3	AQ11912	7/24/2008	6-12	Silty gravelly sand. No discoloration.	182	21
STZ-60-4	AQ11913	7/24/2008	12-18	Silty gravelly sand. No discoloration.	178	17
STZ-61-1	AQ13202	8/14/2008	0-2	Silty gravelly sand. Site is located in a drainage bottom. This interval appears to be recent alluvium. Water sorted with weak bedding visible. No discoloration.	568	38
STZ-61-2	AQ13203	8/14/2008	2-9	As above.	174	19
STZ-61-3	AQ13204	8/14/2008	9-16	Silty sandy gravel. Appears to be alluvium. No discoloration.	116	10
STZ-67-1	AQ11629	7/18/2008	0-2	Gravelly silt. No discoloration.	451	22
STZ-67-2	AQ11630	7/18/2008	2-6	Gravelly silt. No discoloration.	377	22
STZ-67-3	AQ11631	7/18/2008	6-12	Gravelly silt. No discoloration.	334	22

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-67-4	AQ11632	7/18/2008	12-18	Silty gravel. No discoloration.	414	26
STZ-68-1	AQ12891	8/8/2008	0-2	Gravelly silt. No discoloration.	644	27
STZ-68-2	AQ12892	8/8/2008	2-6	As above.	349	18
STZ-69-1	AQ12893	8/8/2008	0-2	Gravelly silt. No discoloration.	666	31
STZ-69-2	AQ12894	8/8/2008	2-6	As above.	372	23
STZ-70-1	AQ12895	8/8/2008	0-2	Gravelly silt. No discoloration.	863	41
STZ-70-2	AQ12896	8/8/2008	2-6	As above.	361	22
STZ-71-1	AQ12897	8/8/2008	0-2	Gravelly silt. No discoloration.	563	24
STZ-71-2	AQ12898	8/8/2008	2-6	As above.	344	19
STZ-72-1	AQ12899	8/8/2008	0-2	Gravelly silt. No discoloration.	450	24
STZ-72-2	AQ12900	8/8/2008	2-6	As above.	284	21
STZ-73-1	AQ12901	8/8/2008	0-2	Sandy gravelly silt. No discoloration.	237	14
STZ-73-2	AQ12902	8/8/2008	2-6	As above.	149	12
STZ-74-1	AQ12903	8/8/2008	0-2	Gravelly silt. No discoloration.	388	22
STZ-74-2	AQ12904	8/8/2008	2-6	As above.	240	14
STZ-75-1	AQ12905	8/8/2008	0-2	Sandy silt. No discoloration.	4760	168
STZ-75-2	AQ12906	8/8/2008	2-6	As above.	2300	19
STZ-76-1	AQ12907	8/8/2008	0-2	Gravelly silt. No discoloration.	152	11
STZ-76-2	AQ12908	8/8/2008	2-6	As above.	98	11
STZ-77-1	AQ12909	8/8/2008	0-2	Gravelly sandy silt. No discoloration.	778	52
STZ-77-2	AQ12910	8/8/2008	2-6	As above.	208	22
STZ-78-1	AQ13010	8/12/2008	0-2	Silty gravelly sand. This appears to be recent alluvium possibly related to historic ditches due to close proximity to ditches although there is no discoloration.	626	35
STZ-78-2	AQ13011	8/12/2008	2-6	As above.	220	20

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-85-3	AQ13224	8/14/2008	8-12	Silty sandy gravel. Strong caliche coating on gravel surface and in matrix material.	472	24
STZ-86-1	AQ13113	8/13/2008	0-2	Silty sandy gravel. No discoloration.	818	31
STZ-86-2	AQ13114	8/13/2008	2-8	As above.	1290	32
STZ-87-1	AQ13115	8/13/2008	0-2	Silty sandy gravel. No discoloration.	3250	76
STZ-87-2	AQ13116	8/13/2008	2-6	As above.	304	15
STZ-89-1	AQ12911	8/8/2008	0-2	Gravelly silt. No discoloration.	929	48
STZ-89-2	AQ12912	8/8/2008	2-6	As above.	501	33
STZ-90-1	AQ12913	8/8/2008	0-2	Gravelly silt. No discoloration.	11300	640
STZ-90-2	AQ12914	8/8/2008	2-6	As above.	17000	656
STZ-90-3	AQ13991	8/28/2008	6-18	Sandy clayey silt. No discoloration.	785	35
STZ-90-4	AQ13992	8/28/2008	18-26	Gravelly sandy silt. Caliche.	346	21
STZ-91-1	AQ13235	8/14/2008	0-2	Gravelly sandy clay. No discoloration.	517	34
STZ-91-2	AQ13236	8/14/2008	2-6	As above.	1390	86
STZ-91-3	AQ13237	8/14/2008	6-11	Silty gravelly sand. Water sorted material. Locally bedding visible.	2380	106
STZ-91-4	AQ13238	8/14/2008	11-18	Gravelly silty sand. Caliche on gravel surface and in matrix material. Appears to be undisturbed native soil.	113	7
STZ-103-1	AQ13228	8/14/2008	0-2	Gravelly silt. No discoloration.	2010	90
STZ-103-2	AQ13229	8/14/2008	2-5	As above.	181	16
STZ-103-3	AQ13230	8/14/2008	5-12	Gravelly silt. No discoloration.	157	14
STZ-103-4	AQ13231	8/14/2008	12-20	Sandy gravelly silt. No discoloration.	135	12
STZ-104-1	AQ13789	8/25/2008	0-4	Clayey silt. No discoloration.	11100	743
STZ-104-2	AQ13790	8/25/2008	4-8	Clayey gravelly silt. No discoloration.	466	31
STZ-104-3	AQ13791	8/25/2008	8-14	Clayey silt. No discoloration.	373	26

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-104-4	AQ13231	8/25/2008	14-20	Clayey silt with caliche.	135	12
STZ-108-1	AQ13205	8/14/2008	0-2	Sandy gravel. Alluvium. Weak bedding visible.	8440	417
STZ-108-2	AQ13206	8/14/2008	2-8	As above.	3770	151
STZ-108-3	AQ13207	8/14/2008	8-12	Silty sandy gravel. No discoloration.	294	18
STZ-109-1	AQ13208	8/14/2008	0-2	Site is located in a drainage. Gravelly sandy silt. Very weak orange color near surface.	9300	680
STZ-109-2	AQ13209	8/14/2008	2-6	As above.	1130	78
STZ-109-3	AQ13210	8/14/2008	6-12	As above.	277	18
STZ-110-1	AQ13225	8/14/2008	0-2	Gravelly silty sand. Very weak orange color at surface.	3170	120
STZ-110-2	AQ13226	8/14/2008	2-6	As above.	1270	40
STZ-110-3	AQ13227	8/14/2008	6-13	Silty sandy gravel. Predominately gravel. Caliche on gravel surface and in matrix. Appears to be undisturbed native soil.	1340	19
STZ-111-1	AQ13793	8/25/2008	0-5	Gravelly sandy silt. No discoloration.	466	29
STZ-111-2	AQ13794	8/25/2008	5-11	Silty sandy gravel. Caliche coating on gravel clasts.	210	20
STZ-111-3	AQ13795	8/25/2008	11-24	As above.	255	25
STZ-115-1	AQ13799	8/25/2008	0-8	Sandy gravelly silt. No discoloration.	7960	276
STZ-115-2	AQ13800	8/26/2008	8-16	As above.	335	26
STZ-115-3	AQ13801	8/27/2008	16-24	Silty sandy gravel. Caliche.	237	26
STZ-116-1	AQ13211	8/14/2008	0-2	Sandy gravelly silt. This interval appears to be alluvium comprised of fine gravel, sand and silt. No discoloration.	7840	295
STZ-116-2	AQ13212	8/14/2008	2-6	As above.	5900	173
STZ-116-3	AQ13213	8/14/2008	6-12	As above.	1840	42

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-116-4	AQ13214	8/14/2008	12-20	Gravelly sandy silt. This may also be alluvium. No discoloration.	223	11
STZ-117-1	AQ13215	8/14/2008	0-2	Gravelly sandy silt. No discoloration.	8320	310
STZ-117-2	AQ13216	8/14/2008	2-6	Sandy gravel. This is water sorted alluvium containing fine gravel and coarse sand.	1520	71
STZ-117-3	AQ13217	8/14/2008	6-12	As above.	1210	32
STZ-117-4	AQ13218	8/14/2008	12-20	As above.	2210	45
STZ-117-5	AQ13219	8/14/2008	20-27	As above.	3800	30
STZ-117-6	AQ13996	8/28/2008	27-39	Sandy gravelly silt. No discoloration.	271	23
STZ-118-1	AQ13796	8/25/2008	0-7	Clayey gravelly silt. No discoloration.	197	41
STZ-118-2	AQ13797	8/25/2008	7-15	Silty sandy gravel. No discoloration.	279	22
STZ-118-3	AQ13798	8/25/2008	15-24	Silty sandy gravel with caliche coating.	369	24
STZ-124-1	AQ13975	8/28/2008	0-2	Sandy gravelly silt. No discoloration.	379	26
STZ-124-2	AQ13976	8/28/2008	2-7	As above.	232	18
STZ-124-3	AQ13977	8/28/2008	7-13	Sandy silty gravel. No discoloration.	258	14
STZ-124-4	AQ13978	8/28/2008	13-19	As above.	329	19
STZ-124-5	AQ13979	8/28/2008	19-28	As above.	312	21
STZ-125-1	AQ13243	8/14/2008	0-2	Gravelly sandy silt.	319	18
STZ-125-2	AQ13244	8/14/2008	2-5	As above.	230	16
STZ-125-3	AQ13245	8/14/2008	5-12	Gravelly sandy silt. Gravel is coarser than above.	235	16
STZ-125-4	AQ13246	8/14/2008	12-18	Sandy gravelly silt.	307	18
STZ-126-1	AQ13291	8/14/2008	0-2	Sandy gravelly silt. No discoloration.	461	25
STZ-126-2	AQ13292	8/14/2008	2-5	As above.	313	29
STZ-126-3	AQ13293	8/14/2008	5-13	Sandy silty gravel. Alluvium.	343	35
STZ-126-4	AQ13294	8/14/2008	13-19	Sandy gravel. No discoloration.	425	31

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-1-1	AQ11617	7/18/2008	0-2	Gravelly silt. No discoloration.	318	19
STNE-1-2	AQ11618	7/18/2008	2-6	Gravelly silt. No discoloration.	300	16
STNE-1-3	AQ11619	7/18/2008	6-12	Gravelly silt. No discoloration.	301	16
STNE-1-4	AQ11620	7/18/2008	12-18	Gravelly silt. No discoloration.	283	17
STNE-2-1	AQ11621	7/18/2008	0-2	Sandy gravelly silt. No discoloration.	343	20
STNE-2-2	AQ11622	7/18/2008	2-6	Sandy gravelly silt. No discoloration.	462	20
STNE-2-3	AQ11623	7/18/2008	6-12	Sandy gravelly silt. No discoloration.	294	21
STNE-2-4	AQ11624	7/18/2008	12-18	Sandy gravelly silt. No discoloration.	285	18
STNE-3-1	AQ11625	7/18/2008	0-2	Gravelly sandy silt. No discoloration.	229	14
STNE-3-2	AQ11626	7/18/2008	2-6	Gravelly sandy silt. No discoloration.	195	17
STNE-3-3	AQ11627	7/18/2008	6-12	Sandy gravelly silt. No discoloration.	208	17
STNE-3-4	AQ11628	7/18/2008	12-18	Sandy gravelly silt. No discoloration.	217	20
STNE-5-1	AQ11530	7/17/2008	0-6	Gravelly sandy silt. Site is located in a drainage bottom.	4890	320
STNE-5-2	AQ11531	7/17/2008	6-12	Sandy gravel. Recent alluvium. Gravel is predominately waste rock. Orange-brown and yellow discoloration.	16400	1240
STNE-7-1	AQ11532	7/17/2008	0-2	Silty sandy gravel. Recent alluvium. Locally thin lenses of fair to well sorted fine gravel (<0.5" dia.). Very minor yellow discoloration on a few small gravel clasts. Site is located in a drainage bottom.	9500	432
STNE-7-2	AQ11533	7/17/2008	2-6	As above.	9980	1220
STNE-7-3	AQ11534	7/17/2008	6-12	As above.	2950	157
STNE-8-1	AQ11535	7/17/2008	0-2	Gravelly sandy silt with locally thin lenses of well sorted fine gravel (<0.5" dia.). Some gravel is Fe-oxidized on the surface.	9050	582
STNE-8-2	AQ11536	7/17/2008	2-10	As above.	17800	676

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-8-3	AQ11537	7/17/2008	10-16	Sandy gravel. Recent alluvium comprised of waste rock. Gravel is fair sorted (0.25" to 1" dia.). Weak orange and yellow discoloration.	12400	671
STNE-10A-1	AQ13525	8/20/2008	0-2	Gravelly sandy silt. Weak bedding in sand and silt locally. This may be recent alluvium. No discoloration.	1450	56
STNE-10A-2	AQ13526	8/20/2008	2-6	As above.	1640	60
STNE-10A-3	AQ13527	8/20/2008	6-9	Similar to above except more gravel.	459	28
STNE-10A-4	AQ13528	8/20/2008	9-15	Gravelly sandy silt. No discoloration. This appears to be undisturbed native soil.	339	22
STNE-10B-1	AQ13529	8/20/2008	0-2	Site is located in center of current day drainage. Alluvium comprised of fine gravel, sand and silt. Weak orange discoloration and moderate orange discoloration at 8" to 10".	4430	373
STNE-10B-2	AQ13530	8/20/2008	2-10	As above.	7560	622
STNE-10B-3	AQ13531	8/20/2008	10-17	Gravelly silty sand but appears to be recent alluvium. Contains a few "specs" of orange color. Gravel is fine.	9530	400
STNE-10B-4	AQ13532	8/20/2008	17-20	Sandy gravel. Gravel is fair sorted. No discoloration.	2100	89
STNE-10B-5	AQ13533	8/20/2008	20-26	Sandy silt. Massive. Appears to be undisturbed native soil.	326	17
STNE-10C-1	AQ13534	8/20/2008	0-2	Alluvium comprised of gravel, sand and silt. No discoloration.	2920	74
STNE-10C-2	AQ13535	8/20/2008	2-8	Alluvium comprised of gravel, sand and silt. Bedding visible from 4" to 8". No discoloration.	2180	71
STNE-10C-3	AQ13536	8/20/2008	8-14	Sandy silt. Massive. Appears to be undisturbed native soil.	384	22

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-12A-1	AQ13537	8/20/2008	0-2	Gravelly silty sand. May be recent alluvium. Very weak orange color in top 5".	6670	319
STNE-12A-2	AQ13538	8/20/2008	2-8	As above.	14100	595
STNE-12A-3	AQ13539	8/20/2008	8-15	Silty sandy gravel. Appears to be alluvium. Gravel is fair sorted. No discoloration.	658	35
STNE-12A-4	AQ13540	8/20/2008	15-21	Sandy silt. Massive. Appears to be undisturbed native soil.	278	15
STNE-12B-1	AQ13541	8/20/2008	0-2	Silty sandy gravel. Alluvium. No discoloration. Gravel is fair sorted.	2630	88
STNE-12B-2	AQ13542	8/20/2008	2-9	As above.	1180	79
STNE-12B-3	AQ13543	8/20/2008	9-15	Sandy silt. Massive. Appears to be undisturbed native soil.	458	21
STNE-12C-1	AQ13544	8/20/2008	0-2	Site is located in the center of the present day drainage. Sandy gravel. Appears to be alluvium although not necessarily recent alluvium. Gravel is fair sorted.	2770	118
STNE-12C-2	AQ13545	8/20/2008	2-8	As above.	476	29
STNE-12C-3	AQ13546	8/20/2008	8-14	Silty sand. Massive. Appears to be undisturbed native soil.	324	20
STNE-14A-1	AQ13560	8/20/2008	0-6	Site is located in center of present day drainage. Sandy silt. Weak bedding. Weak orange discoloration.	67400	16300
STNE-14A-2	AQ13561	8/20/2008	6-12	Silty sandy gravel. Gravel coated with caliche.	2630	97
STNE-15A-1	AQ13547	8/19/2008	0-7	Silty sandy gravel. No discoloration.	596	31
STNE-15A-2	AQ13548	8/19/2008	7-13	As above.	313	26
STNE-15A-3	AQ13549	8/19/2008	24-28	As above.	348	39

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-16A-1	AQ13550	8/20/2008	0-2	Sandy gravelly silt. Waste rock visible. Bedding visible locally.	12800	659
STNE-16A-2	AQ13551	8/20/2008	2-8	As above.	2880	193
STNE-16A-3	AQ13552	8/20/2008	8-18	Sandy gravelly silt. Caliche. No discoloration.	359	20
STNE-16B-1	AQ13553	8/20/2008	0-6	Site is located in berm between two parallel drainage ditches. Gravelly sandy silt. No discoloration.	3970	143
STNE-16B-2	AQ13554	8/20/2008	8-18	Sandy silt. No discoloration.	357	20
STNE-16C-1	AQ13555	8/20/2008	0-7	Sandy silt. Contains waste rock.	9470	869
STNE-16C-2	AQ13556	8/20/2008	7-13	Gravelly sandy silt. Caliche on gravel surfaces.	451	27
STNE-16C-3	AQ13557	8/20/2008	13-19	As above.	429	25
STNE-16D-1	AQ13558	8/20/2008	0-4	Site is located on north side of northern-most drainage ditch. Gravelly sandy silt. No discoloration.	453	29
STNE-16D-2	AQ13559	8/20/2008	4-10	Gravelly sandy silt. Caliche. No discoloration.	346	17
STNE-17A-1	AQ13467	8/19/2008	0-6	Sandy gravelly silt. Gravel is fair sorted. No discoloration.	7450	307
STNE-17A-2	AQ13468	8/19/2008	6-13	Silty sandy gravel. Massive. Some waste rock visible.	8540	245
STNE-17A-3	AQ13469	8/19/2008	13-20	Silty sandy gravel. Imbricate structures.	481	38
STNE-17A-4	AQ13470	8/19/2008	20-26	As above.	452	29
STNE-17B-1	AQ13471	8/19/2008	0-3	Site is located on berm between two drainage ditches. Sandy gravelly silt. Gravel is fair sorted.	2210	114
STNE-17B-2	AQ13472	8/19/2008	3-10	Silty sandy gravel. Poorly sorted. Massive. Caliche.	485	31
STNE-17B-3	AQ13473	8/19/2008	10-18	As above.	448	24
STNE-17B-4	AQ13474	8/19/2008	18-24	As above.	398	23
STNE-17C-1	AQ13475	8/19/2008	0-6	Gravelly sandy silt. Poorly sorted.	1660	98
STNE-17C-2	AQ13476	8/19/2008	6-14	Silty sandy gravel. Caliche coating on gravel surface.	507	30

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-17C-3	AQ13477	8/19/2008	14-20	As above	375	23
STNE-17C-4	AQ13478	8/19/2008	30-36	Gravelly sand. Weak orange color.	553	55
STNE-18A-1	AQ13321	8/15/2008	0-6	Site is located in a drainage bottom that is approx. 6 feet deep and 25 feet across. Silty sandy gravel. Alluvium. Gravel is fair to well sorted and fine. Bedding visible. Weak orange discoloration.	17200	873
STNE-18A-2	AQ13322	8/15/2008	6-11	As above except orange and yellow discoloration is moderate	15900	384
STNE-18A-3	AQ13323	8/15/2008	11-16	As above.	16800	1190
STNE-18A-4	AQ13324	8/15/2008	16-27	Silty sandy gravel. Bedding is weak to locally non-existent. Gravel is coarser than above. Very weak orange discoloration.	3220	97
STNE-18A-5	AQ13325	8/15/2008	27-33	As above.	907	33
STNE-18B-1	AQ13326	8/15/2008	0-8	Gravelly sandy silt. Weak horizontal bedding visible. Weak orange discoloration.	20300	1110
STNE-18B-2	AQ13327	8/15/2008	8-14	Silty sandy gravel. Poorly sorted. No discoloration.	481	25
STNE-18B-3	AQ13328	8/15/2008	14-23	Sandy gravel. Alluvium. Water sorted. Bedding clearly visible. No discoloration.	735	54
STNE-18B-4	AQ13329	8/15/2008	23-30	Silty sandy gravel. Moderate caliche on gravel surfaces below 30".	383	19
STNE-19A-1	AQ13482	8/19/2008	0-2	Gravelly silty sand. Alluvium. Weak horizontal bedding visible. Weak orange discoloration.	11600	680
STNE-19A-2	AQ13483	8/19/2008	2-6	As above.	24100	1260
STNE-19A-3	AQ13484	8/19/2008	6-12	Gravelly silty sand. Massive. No discoloration.	1310	82
STNE-19A-4	AQ13485	8/19/2008	12-25	As above.	607	37

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-19A-5	AQ13505	8/28/2008	25-36	Silty gravel. White caliche coating on gravel clasts and in matrix.	296	20
STNE-19B-1	AQ13479	8/19/2008	0-2	Gravelly silty sand. Weak orange discoloration. Massive.	2160	115
STNE-19B-2	AQ13480	8/19/2008	2-9	As above.	253	20
STNE-19B-3	AQ13481	8/19/2008	9-21	Silty sandy gravel. No discoloration.	253	20
STNE-19C-1	AQ13486	8/19/2008	0-2	Gravelly silty sand. Appears to be recent alluvium mixed with colluvium. Weak orange discoloration.	10600	681
STNE-19C-2	AQ13487	8/19/2008	2-6	As above.	11800	755
STNE-19C-3	AQ13488	8/19/2008	6-12	Silty gravelly sand. No discoloration.	349	34
STNE-19C-4	AQ13489	8/19/2008	12-30	As above.	280	17
STNE-20-1	AQ13490	8/19/2008	0-2	Gravelly silty sand. No discoloration. Weak bedding visible locally. Appears to be a mixture of recent alluvium and colluvium.	3850	84
STNE-20-2	AQ13491	8/19/2008	2-9	As above.	2660	63
STNE-20-3	AQ13492	8/19/2008	9-16	Sandy silty gravel. No discoloration. No bedding visible.	15200	345
STNE-20-4	AQ13493	8/19/2008	16-24	Silty sandy gravel. Caliche coating on gravel clasts and in matrix. Appears to be undisturbed native soil.	358	35
STNE-21A-1	AQ13494	8/19/2008	0-2	Gravelly silty sand. Weak to moderate orange-brown discoloration. This appears to be recent alluvium. Bedding is clearly visible.	15700	1090
STNE-21A-2	AQ13495	8/19/2008	2-7	As above.	20800	1340
STNE-21A-3	AQ13496	8/19/2008	7-17	Similar to above with less discoloration.	20800	709

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-21A-4	AQ13497	8/19/2008	17-22	Gravelly silty sand. Weak bedding locally to locally massive. No discoloration.	7290	190
STNE-21A-5	AQ13990	8/28/2008	22-32	Silty sandy gravel. Weak orange tint locally.	2770	126
STNE-21B-1	AQ13498	8/19/2008	0-2	Silty sandy gravel. Weak orange discoloration in top two inches. No bedding visible.	2590	118
STNE-21B-2	AQ13499	8/19/2008	2-13	As above with no discoloration.	747	44
STNE-21B-3	AQ13500	8/19/2008	13-24	Sandy gravel. Alluvium. Weak bedding locally. Gravel is fair to well sorted by water.	303	17
STNE-22A-1	AQ13562	8/19/2008	0-8	Sandy gravelly silt. No discoloration.	4220	101
STNE-22A-2	AQ13563	8/19/2008	8-14	Silty sandy gravel. No discoloration.	347	24
STNE-23A-1	AQ13564	8/19/2008	0-8	Sandy silty gravel. Weak orange discoloration.	15400	179
STNE-23A-2	AQ13565	8/19/2008	8-16	Sandy silty gravel. Caliche.	737	35
STNE-24A-1	AQ13980	8/28/2008	0-2	Sandy silt. Weak bedding visible.	12500	456
STNE-24A-2	AQ13981	8/28/2008	2-6	As above.	14500	495
STNE-24A-3	AQ13982	8/28/2008	6-18	Gravelly sandy silt. Bedding visible with weak orange discoloration.	15400	681
STNE-24A-4	AQ13983	8/28/2008	18-24	Silty sandy gravel. Caliche coating on gravel clasts.	272	18
STNE-24A-5	AQ13984	8/28/2008	24-33	As above.	225	13
STNE-24B-1	AQ13985	8/28/2008	0-2	Sandy gravelly silt. No discoloration.	1160	52
STNE-24B-2	AQ13986	8/28/2008	2-7	As above.	260	22
STNE-24B-3	AQ13987	8/28/2008	7-13	Silty sandy gravel. Caliche coating on gravel clasts.	287	22
STNE-24B-4	AQ13988	8/28/2008	13-24	As above.	374	29

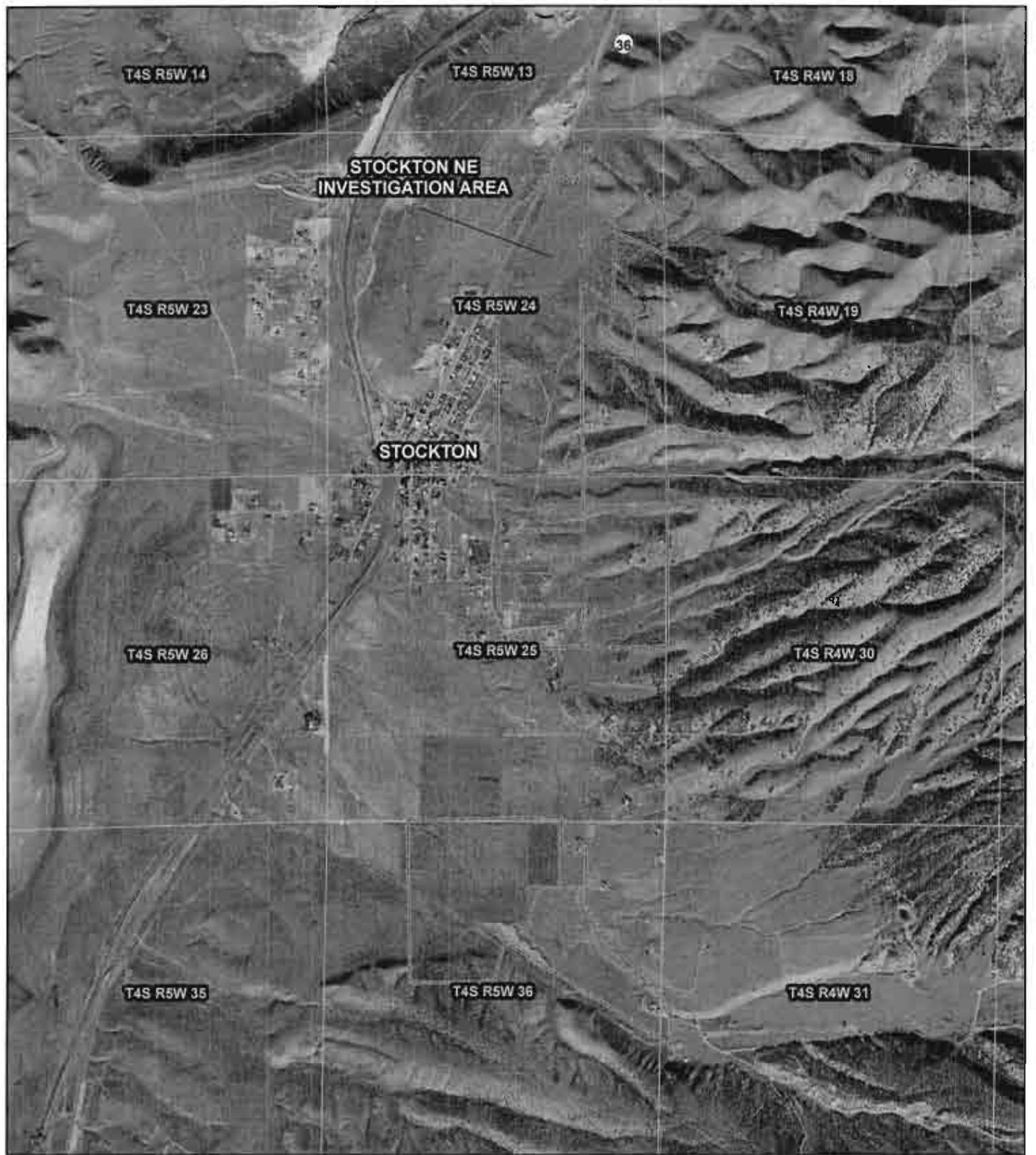
Table 8-2 Blank rinsate water sample analytical results

SAMPLE ID NO.	SAMPLE DATE	LEAD (ug/L)	ARSENIC (ug/L)
STZBR-1	7/10/2008	<5	<5
STZBR-2	7/10/2008	<5	<5
STZBR-3	7/10/2008	<5	<5
STZBR-4	7/17/2008	<5	<5
STZBR-5	7/17/2008	<5	<5
STZBR-6	7/17/2008	<5	<5
STZBR-7	8/8/2008	<5	<5
STZBR-8	8/8/2008	<5	<5
STZBR-9	8/8/2008	<5	<5
STZBR-10	8/14/2008	<5	<5
STZBR-11	8/14/2008	<5	<5
STZBR-12	8/14/2008	<5	<5
STZBR-13	8/19/2008	<5	<5
STZBR-14	8/19/2008	<5	<5
STZBR-15	8/19/2008	<5	<5

Table 8-3 Comparison of split soil sample analytical data using the relative percent difference (RPD)

SAMPLE ID NO.	KEL Pb (mg/kg)	KEL As (mg/kg)	AWAL Pb (mg/kg)	AWAL As (mg/kg)	RPD (%) Pb	RPD (%) As
STNE-1-1	325	17	320	18	1.55	-5.71
STNE-17C-1	2060	114	1900	110	8.08	3.57
STNE-18A-1	17500	1000	18000	1000	-2.82	0.00
STNE-19A-1	11600	713	11000	700	5.31	1.84
STNE-20-1	3410	75	3100	76	9.52	-1.32
STNE-7-1	5830	235	5300	240	9.52	-2.11
STZ-110-1	3250	124	3700	140	-12.95	-12.12
STZ-116-4	241	16	220	13	9.11	20.69
STZ-125-1	310	16	290	16	6.67	0.00
STZ-14-1	776	39	780	41	-0.51	-5.00
STZ-19-4	279	16	260	14	7.05	13.33
STZ-25-1	2820	134	2800	150	0.71	-11.27
STZ-29-1	24100	933	22000	950	9.11	-1.81
STZ-30-1	2750	170	2900	190	-5.31	-11.11
STZ-37-1	3030	148	2800	150	7.89	-1.34
STZ-37-2	261	19	250	15	4.31	23.53
STZ-39-3	7780	349	8700	380	-11.17	-8.50
STZ-43-1	3050	142	3300	160	-7.87	-11.92
STZ-45-4	3040	96	3000	100	1.32	-4.08
STZ-47-2	674	30	610	26	9.97	14.29
STZ-51-1	3050	115	3000	120	1.65	-4.26
STZ-54-4	124	16	110	15	11.97	6.45
STZ-70-1	826	39	830	40	-0.48	-2.53
STZ-78-1	679	36	680	41	-0.15	-12.99
STZ-89-1	882	42	850	43	3.70	-2.35
STZ-91-3	1350	65	1400	67	-3.64	-3.03

APPENDIX C
MAP



 NE STOCKTON PROPERTY



0 1,000 2,000



1 inch = 2,000 feet

RioTinto	APPENDIX C KENNECOTT BARNEYS CANYON NE STOCKTON PROPERTY	
	ENVIRONMENTAL RESTORATION GROUP	
	Drawing Number: 454-T-0405	
	Kennecott Utah Copper	Date: May 2009 Drawn By: JI Project Mgr: KP Rev

**APPENDIX D
WORK PLAN**

RioTinto

Kennecott Utah Copper | Environmental Restoration Group

Access Control Construction and Maintenance
Work Plan

Kennecott Stockton Northeast Property

May 2009

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1. Introduction

This Access Control Construction and Maintenance Work Plan (Work Plan) has been prepared pursuant to the work requirements of a Settlement Agreement and Administrative Order on Consent (AOC) in the matter of “Kennecott NE Stockton Property”, CERCLA Site ID # 08-PD between the United States Environmental Protection Agency (EPA), Kennecott Utah Copper LLC (KUC), and its affiliate Kennecott Barneys Canyon Mining Company (KBCM).

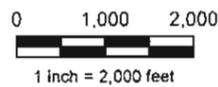
This Work Plan addresses heavy metals contamination on a portion of a land (NE Stockton Property) owned by KBCM located immediately northeast of Stockton, Utah, in Sections 24 and 25, T4S, R5W, and east of State Highway 36 (Figure 1-1).

A portion of the NE Stockton Property is located directly down-gradient from historic mine workings that are not controlled by either KUC or KBCM at this time. These mine sites have un-reclaimed and uncontrolled waste rock piles known to contain elevated concentrations of lead and arsenic. Material from erosion of these waste piles has run on to the NE Stockton Property. KUC has evaluated the nature and extent of lead and arsenic contamination on the NE Stockton Property (KUC, 2008) and has identified drainage bottoms, historic ditches, and depositional areas that contain visible mine waste with concentrations of lead that exceed 3,000 mg/kg. EPA and KUC have determined that it is not advisable to remove or cap the contaminated mine waste due to continuing releases from the upgradient mine waste piles.

The objective of providing access control on the parcel is to minimize human exposure to lead- and arsenic-bearing mine waste on the property. Due to the rural nature of the property and its attraction and traditional use as a recreational area, fencing serves primarily as a warning and deterrent. The level of access control specified in this Work Plan is not intended to prevent a determined trespasser from entering the site.



 NE STOCKTON PROPERTY



RIO TINTO	FIGURE 1-1 KENNECOTT NE STOCKTON PROPERTY	
	ENVIRONMENTAL RESTORATION GUIDE	
	Drawing Number: 454-T-0405	
	Kennecott Utah Copper	Draw: May 2009 Drawn by: JJ Project Mgr: KP Rev:

2. Work Management

2.1 Responsibilities

Construction activities conducted under this Work Plan will be managed by the Kennecott Environmental Restoration Group. Long term maintenance and inspection activities will be conducted by the Kennecott Environmental Restoration Group, another functional group within KUC or an affiliated company, or a contractor. As required by the AOC, if KUC designates a different or additional Project Coordinator, KUC will notify EPA of the new or additional coordinators contact information and qualifications.

2.2 Sampling and Analysis Plan

All environmental soil or mine waste sampling activities conducted under this Work Plan will adhere to the Sampling and Analysis Plan (SAP) included in Appendix A.

2.3 Health and Safety Plan

KUC will submit a Health and Safety Plan for construction and maintenance activities at least 30 days prior to starting construction work. If permissible site uses under KUC control as listed in Section 5 have the potential to significantly disturb contaminated material, the Health and Safety Plan will be supplemented, prior to conducting the activity, to describe measures to minimize human exposure to lead- or arsenic-bearing wastes.

2.4 Applicable or Relevant and Appropriate Requirements

Work conducted under this Work Plan must adhere to local, state and federal applicable or relevant and appropriate requirements (ARARs) as required by National Contingency Plan (NCP; 40 CFR 300.415(j)). Section 121(e) of CERCLA (42 USC 9621(e)) provides that on-site removal actions do not require any federal, state or local permits. ARARs that apply to this project are listed in Table 2-1

Table 2-1 Applicable or Relevant and Appropriate Requirements

Requirement	Citation	Comment
Minimize fugitive dust emissions	UAC R307-205	Dust generation is possible during vegetation grubbing along fence alignment and road rerouting.
Protect surface water quality from storm water discharges	UAC R317-1-2 UAC R317-8	Road reconstruction could create potential for storm water erosion and runoff. Disturbances greater than 1 acre require compliance with UPDES General Permit UTR300000 for Construction Activities
Notification regarding off-site releases of reportable quantities of CERCLA hazardous substances	40 CFR 355.33 UAC R315-9	Storm events could transport hazardous substances off site.
No placement of structures in stream channels that could diminish channel's ability to conduct high flows	UAC R655-13, Tooele County Land Use Ordinance 13-3	Fencing crosses several natural channels. Fence posts and fencing should not be placed such that there is a potential to reduce stream channel capacity

3. Access Control Design and Construction

The physical access controls KUC will construct and maintain on the property include:

- Perimeter fence
- Locked gates
- Warning signage

KUC will construct a perimeter fence generally along the alignment indicated on Figure 2-1 to restrict access to contaminated areas. Site conditions during construction may require minor modifications to this alignment. Fencing will preserve access to a Tooele County-designated dirt road that runs north-south through the Kennecott Property; however, part of the road will be re-routed around an area of lead contamination. Access will also be preserved for a dirt road from the county road to the northeast in an effort to minimize vandalism of fencing and gates.

Typical perimeter fence construction will be a four-strand wire fence with metal fence posts. The design will adhere to US Bureau of Land Management (BLM, 1989) guidelines for big game movement (elk, deer, and pronghorn).

KUC will construct gates at the locations indicated on Figure 3-1. Gates will typically be swing gates constructed with steel pipe or similar material and **securely anchored** into the ground. Gate design and gate location may be altered at KUC's discretion as long as adequate control is maintained.

KUC will post signs at all gates and at regularly spaced intervals (approximately every 100 feet) along the fence. Signage will similar to that shown in Figure 3-2. Gate signs will be at least 10 inches high by 14 inches wide; fence signs will be at least 7 inches high by 10 inches wide.

KUC will commence fence construction in Spring 2009 as site conditions permit, and complete construction of access controls by August 31, 2009.



	KENNECOTT PROPERTY BOUNDARY
	APPROXIMATE FENCE ALIGNMENT
	GATE
	SOIL W/ LEAD GREATER THAN 3000 mg/kg
	TOOELE COUNTY CLASS B NATIVE ROAD


 0 250 500

 1 inch = 500 feet

RioTinto

FIGURE 3-1 STOCKTON NORTHEAST PARCEL FENCE PLAN	
ENVIRONMENTAL RESTORATION GROUP	
Drawing Number: 414-7-0304	
Kennebecott Utah Copper	Date: 3/20/04 Rev: 01 Project Mgr: SP Rev: 1

Figure 3-2 Example Signage



4. Inspection and Maintenance

4.1 Access Controls

KUC will inspect the perimeter fence, gates, and signage twice each year in approximately July and November. Inspections will verify that fencing, gates, and signage remain intact; inspectors will also make observations regarding possible unauthorized access of the fenced-in property. A record of inspections will be maintained in KUC's project files.

Within 30 days, site conditions permitting, of becoming aware of any breach in the fencing or gates, KUC will repair the fencing or gates. From time to time as needed, KUC will repair or replace components of the fencing due to normal weathering and/or use.

4.2 Sediment Run-on and Run-off

During semiannual inspections, KUC will make observations of possible recent sediment run-on or run-off. KUC will also conduct unscheduled inspections on becoming aware of any severe thundershower activity in the Stockton area. KUC will document observations from run-on and run-off inspections in project files.

In the event of a run-off event that transports a notable volume of sediment off-site, KUC will timely notify EPA and DEQ after becoming aware of the event, and promptly make an evaluation of the event. This evaluation will include mapping of the run-out area (to the extent KUC is given access to non-KUC property); an estimate of the volume of sediment transported off site; sampling for lead and arsenic; determination of the likely source of sediment (i.e. whether sediment was entrained from the KUC property or from upgradient areas); summary of the storm details; and other relevant information. KUC will provide this information to EPA and DEQ and will coordinate with the agencies to determine the need for and nature of any response.

4.3 Additional Sampling

KUC will conduct one-time soil sampling for lead and arsenic in the ephemeral drainage bottoms at the KUC property boundary downgradient of the contaminated areas to document current conditions. A sampling and analysis plan is included in Appendix A. KUC will complete this sampling and report results to EPA and DEQ as an addendum to the site Characterization and Source Assessment report (KUC, 2008) by August 31, 2009.

5. Permissible Site Uses and Restrictions

KUC will discontinue any grazing use within the fenced-in area and will not authorize recreational use of the controlled area.

Within the controlled area, KUC will allow access for:

- Environmental monitoring and investigation
- Fencing inspection and maintenance
- Power line inspection and maintenance
- Fire control and restoration
- Mineral exploration
- Other similar and controlled uses

KUC will use reasonable efforts to advise authorized persons entering the property of site risks and appropriate personal protective measures.

KUC will request that authorized site entrants make reasonable efforts to avoid travel across contaminated areas. If authorized travel across contaminated area is necessary, KUC will request that operators brush off vehicles and equipment prior to leaving the contaminated area if there is notable mud or sediment accumulation on the vehicle. KUC will advise authorized entrants needing to travel across contaminated areas to adjust speed to minimize dust generation.

6. Reporting

KUC will make a report annually (or as otherwise directed) to EPA of the results of inspections and any maintenance activities. Reports will be submitted by January 31 of each year for the period covering the preceding calendar year.

KUC will notify EPA of any significant unauthorized uses or disturbance within the controlled area within a reasonable time of becoming aware of the use or disturbance.

If permissible site uses under KUC control as listed in Section 5 have the potential to disturb contaminated material, KUC will notify EPA reasonably in advance of the activity.

7. Community Communications

Prior to construction of the fence, KUC will brief Stockton town officials and Tooele County officials regarding the access controls being placed on the property. KUC will distribute fliers to advise Stockton residents of the type of and need for site access restrictions, and request the community's assistance in reporting any activity on the site.

In the future, KUC may re-distribute fliers to remind Stockton residents of the site controls.

KUC will coordinate with EPA and DEQ prior to significant communications with local officials or residents regarding the site access controls.

8. References

BLM, 1989. BLM fence standards for livestock and wildlife. BLM Manual 1-1572.

KUC, 2008. Characterization and Source Assessment of Lead and Arsenic Contamination, Kennecott Stockton, Northeast Parcel. December.

Appendix A

Sampling and Analysis Plan

A1. Introduction

This Appendix to the Kennecott Stockton Northeast Parcel Access Control Construction and Maintenance Work Plan describes the protocols for any soil or mine waste sampling conducted under this plan.

A2. Sampling Procedures

The following sections describe specific sampling procedures for the sample collection process. The procedures are designed to insure that the sample collection process is sufficiently documented.

The following sequence of events will be followed for all samples collected:

- Fill out logbook header.
- Document initial information about the individual samples and site conditions in the field logbook including a map or diagram.
- Label sample containers with the sample identification number, date, time and samplers' name.
- Collect sample.
- Record the sample description in the field logbook.
- Photograph site and or sample material.
- Prepare a chain of custody form.
- Package and deliver samples.

Each of the above events is described in detail in the following sections.

A2.1 Logbook Header

An up-to-date sampling field notebook will be maintained by on-site personnel during all sampling activities. The general information recorded for each day's sampling event includes:

- Date
- Name of overall sampling event and project number
- Sampling personnel
- Climatic conditions

A2.2 Logbook Sample Entries

For each sample collected the logbook will contain:

- Sample identification number
- Location with measurements
- Sample time
- Sample type (grab, composite, etc.)
- Field observations map or diagram
- Analysis to be performed

Any deviation from the sampling protocol will be formally noted in the field logbook along with the names of visiting personnel and any unusual circumstances pertinent to the sampling effort.

A2.3 Sample Collection

The following sections describe the specific procedures that will be used to collect soil samples.

A2.3.1 Surveying

All sample sites will be surveyed using a global positioning satellite system unit (GPS) with sub-meter horizontal capability. Locations will be reported in Utah State Plane coordinate system. Sample sites will be marked in the field with a wood stake and labeled with indelible ink with the sample identification number.

A2.3.2 Sample Containers and Sample Identification Numbers

Sample containers, preservation techniques and holding times will be consistent with EPA SW-846 guidelines. Soil samples to be analyzed for metals will be placed in plastic ziplock bags or plastic or glass jars. No preservation is necessary for metals analysis and the holding time is 6 months.

To prevent misidentification of samples each sample container will be labeled with indelible ink. The following information will be recorded on the sample container:

- Sample identification number
- Sampler's name
- Date and time of collection

Sample identification (ID) numbers will be assigned as follows:

- The sample ID number will begin with the specific prefix designated for the sampling program (e.g. "STNE") followed by a dash.
- The next number in the sequence is the unique site ID number. The first sample site will be 1, the next site 2 and so on followed by a dash.
- The third number in the sequence will be 1 for the shallowest sample collected from that site. The next deepest sample collected from the same site will be 2 and so on.

Examples of sample ID numbers collected from site 1 would be: STNE-1-1 for the shallowest sample and STNE-1-2 for the next deepest sample and so on.

A2.3.3 Sampling Procedure

Soil samples will be collected from holes excavated with a backhoe, a hand shovel or pick hoe. Specific sampling procedures are described below.

Soil samples will be collected using disposable plastic or decontaminated stainless steel or plastic hand tools. These tools may include one or more of the following:

- Disposable plastic spoon, trowel or cup
- Stainless steel spoon or trowel
- Hand shovel and pick hoe
- Stainless steel bowl
- Gloves (vinyl, latex, nitrile)

Only disposable plastic or decontaminated stainless steel tools will contact the sample material. Hand shovels or pickhoes will be used only to gain access to the sample material. Disposable plastic or decontaminated stainless steel tools will be used to sample the material. Reusable sampling tools will be decontaminated prior to use following the procedures described in Section A2.3.8

A trackhoe or hand tools will be used to excavate a hole at each sample site to maximum depth below the surface specified for the sample. A clean disposable plastic spoon or decontaminated plastic or stainless steel trowel will be used to scrape loose soil from the side of the excavation wall until undisturbed sample material is exposed. A disposable plastic cup will be placed at the bottom of the desired sample interval and a clean disposable plastic or decontaminated stainless steel spoon or trowel will be used to scrape the sample material from the desired interval allowing it to fall into the cup. Care will be taken to insure that the entire sample interval is

represented in the sample. The contents of the cup will be transferred to a plastic ziplock bag.

A2.3.4 Sample Homogenization

Soil sample material will be homogenized prior to analysis. This will be done either in the field or at the laboratory. Homogenization techniques will vary depending on the sample texture and moisture content. Homogenization will be accomplished by shaking or stirring the sample material in the sample container or if necessary by transferring to a stainless steel bowl. If drying is necessary prior to homogenization, temperatures will be low enough to prevent the loss of the analytes of concern. All reusable tools used in the homogenization process will be decontaminated following the procedures described in Section 5.4.8

A2.3.5 Sample Description

Sample material will be described in the field logbook. Sample descriptions will include the following:

- Color/discoloration
- Texture (clay, silt, sand, gravel)
- Degree of compaction
- Moisture content
- Depositional features (water deposited, colluvium, layered, massive, etc)
- Any other observations pertinent to the sampling effort

A2.3.6 Photographs

A photograph will be taken of the sample site and or sample material. A photograph log will be maintained in the field logbook. The log will contain the following information:

- Photograph identification number
- Orientation of photograph
- Identification of site
- Date of photograph
- Photographer's name

A2.3.7 Chain of Custody

Sample chain of custody will be maintained for all samples collected. A chain of custody record will be filled out and will accompany every set of samples in order to establish the documentation necessary to trace sample possession from the time of collection. The record will include the following:

- List of sample numbers
- Signature of collector
- Date and time of collection
- Sample types
- Number of containers
- Parameters requested for analysis
- Signature of person(s) involved in the chain of possession
- Inclusion dates of possession

A2.3.8 Decontamination Procedures

All non-disposable sampling equipment will be decontaminated prior to reuse. Equipment decontamination procedures are as follows:

- Remove gross contaminants
- Wash with Alconox soap
- Rinse with tap water
- Triple rinse with de-ionized water

Sampling equipment will be decontaminated on site and water used for the decontamination process will be discarded in the sample hole.

A3. Quality Assurance/Quality Control Samples

Quality assurance and quality control (QA/QC) samples will include split samples and equipment rinsate samples. A minimum of two split samples will be collected per sampling event; if more than 30 total samples are collected, the frequency of split samples is one for every 15 samples collected. Split samples will be submitted to the primary lab for analysis. After analysis, the remaining sample material will be crushed/ground to the less than the number 65 standard sieve size and homogenized. The sample will then be split and assigned a new sample identification number. One of the splits will be analyzed at the primary lab and the other will be sent to a secondary lab for analysis. The analytical results of the original unprepared sample will be considered the reportable results and the prepared sample analysis will be used only to evaluate the precision of the laboratories.

A minimum of two rinseate samples will be collected per sampling event; if more than 40 total samples are collected, one equipment rinsate sample will be collected for every 20 soil samples collected while using non-disposable sampling implements. This sample will consist of de-ionized water poured over decontaminated sample collection devices and collected in a sample container. This sample will serve as a check on the quality of the decontamination process.

The primary analytical laboratory will be Kennecott Environmental Laboratory (KEL) and the secondary laboratory will be specified by the Project Coordinator. Both laboratories will be State of Utah certified and as such follow QA/QC procedures consistent with EPA standards. Laboratory QA/QC samples include method blanks, matrix spikes, matrix spike duplicates and calibration and calibration check samples.

A4. Analytical Procedures

Soil samples will be analyzed at KEL for total concentrations of lead and arsenic and moisture content. The results of the analysis will be reported on a dry weight basis. Split samples will be analyzed at the secondary laboratory for the same analytes. KEL uses EPA Method SW-846, 3050B (acid digestion of sediments, sludge and soils) as the sample preparation method while some secondary laboratories uses preparation Method SW-846, 3051 (microwave assisted digestion of sediments, sludge and soils). KEL and the secondary laboratory will both use analytical method SW-846, 6010B (inductively coupled plasma atomic emission spectrometry/ICPAES). Although the preparation methods may be slightly different, recent experience has shown that both methods produce similar results.

A5. Data Quality Objectives

The purpose of data quality assessment is to assure that data generated under the QA/QC program is reconciled, accurate and consistent with program data quality objectives. The quality of the data will be assessed based on precision, accuracy and completeness. Percent precision is the degree to which a measurement is reproducible and will be assessed by a comparison of split sample results. A relative percent difference (RPD) of 35% for the split samples is the precision goal. Percent accuracy is a determination of how close the measurement is to the true value and will be assessed via spike recovery in sample matrices and blanks. This will be performed by the laboratory as part of their QA/QC procedures. Spike recoveries reported by the laboratories need to be within 20% of the spiked amount. Completeness is a measure of the amount of valid data obtained, compared to the amount that was expected under normal conditions. Ninety (90%) percent completeness is the goal of this Sampling Plan. Resolution of data discrepancies will be conducted as outlined below.

Data generated from the sampling and analysis will be reviewed and evaluated for usability. Review of the data will include the following:

- Comparison of laboratory confirmation analysis.
- Check of laboratory quality control reports.
- Comparison of sample descriptions from field notes and associated analytical results to determine and verify trends.
- Reanalysis of samples in question.
- Collection of additional samples for confirmation purposes.

The analytical results of the confirmation samples will be compared by calculating the relative percent difference (RPD). The RPD is defined as:

$$RPD = (A_1 - A_2) / ((A_1 + A_2) / 2) * 100$$

where

A₁ = Analytical results from primary lab

A₂ = Analytical results from secondary lab

The data quality objective for this comparison is ± 35%. Data that exceeds the RPD in excess of 35% may still be considered usable if the analyte is detected in quantities less than ten times the method detection limit. For example, if lead is detected at 1.5

mg/kg by one lab and 3.0 mg/kg by the other with a detection limit of 0.5 mg/kg, the RPD would be 66%. However the actual difference is only 1.5 mg/kg and could easily be attributed to the non-homogeneous nature of the sample material. In this situation the data would be considered valid and usable.

If a split sample was found to contain 23 mg/kg lead by one lab and 450 mg/kg by the other, there is most likely a problem with one or both of the laboratories. The data is not valid without additional checks, however, it may still be usable if neither of the samples contain lead in a concentration close to the action level for lead. If adjacent or similar samples confirm lead values near or below 450 mg/kg the data would be considered usable. Additional analysis would still be required from one or both laboratories to determine if the difference is due to the analysis or the non-homogeneous nature of the splits.

Laboratory quality control reports will be reviewed for every sample. The reports include data for matrix spike samples, matrix spike duplicate samples, blank samples and spiked blank samples. The percent recovery must be within $\pm 20\%$.

Sample descriptions will be checked regularly to insure that they are consistent with previous analytical data that have been used to identify contaminated or clean material. Analytical results that are inconsistent with field observations will be considered for reanalysis.

As analytical data is collected the degree of homogeneity of the sampled material will be evaluated. If the sampled material consistently produces erratic results, this will be taken into account in evaluating the validity and usability of the data. If QC results detect conditions or data that do not meet QC requirements, corrective action will be initiated. The nature of the action will depend on the circumstances unique to each situation and may include the following:

- Reanalyzing the samples if holding time criteria permits.
- Re-sampling and reanalyzing.
- Evaluating and amending sampling and analytical procedures.
- Accepting the data, acknowledging the level of uncertainty.
- Conducting a laboratory audit.

A6. Reporting

All data generated during this investigation will be documented in a sampling report. This report will include the following:

- Field notes
- Chain of custody forms
- Photographs
- Laboratory analytical certificates
- Laboratory quality control documentation
- Sample location maps

Conclusions and recommendations drawn from the data will be included in the sampling report as dictated by the purpose for sampling.

The draft sampling report will be submitted in draft to EPA within 45 days of completion of sampling. A final sampling report incorporating any comments by EPA will be submitted within 30 days of receipt of comments. If additional time is needed to complete and submit a report, KUCC will make a request of EPA.

APPENDIX E
LEGAL DESCRIPTIONS OF PROPERTY

APPENDIX E

CERCLA Site #08-PD

LEGAL DESCRIPTIONS OF PROPERTY

I. All of the following described real property situated in **Township 4 South, Range 5 West, SLB&M.**

A. Those portions of **Section 24** described as follows:

1st: Beginning at the South Quarter Corner of Section 24; thence North 1320 feet, thence East 999.90 feet, thence South 1320 feet, thence West 999.90 feet to the point of beginning.

Tax ID No. 01-184-0-0003

2nd: Beginning at the Southwest Corner of the Northwest Quarter of the Southeast Quarter of Section 24; thence North 2043.70 feet, thence South 62°16' East 1129.67 feet, thence South 1518 feet, thence West 999.90 feet to the point of beginning.

Tax ID No. 01-185-0-0003

3rd: Beginning at the Southeast Corner of the Southwest Quarter of the Southeast Quarter of Section 24; thence West 320.10 feet, thence North 2838 feet, thence South 62°16' East 127.03 feet, thence North 29°29' East 333.40 feet, thence South 63°43' East 48.60 feet, more or less, to "40" line, thence South 2986.60 feet, more or less, to the point of beginning.

Tax ID No. 06-020-0-0012

4th: Beginning at a point 206.55 feet East of the Southwest Corner of the Northwest Quarter of the Northeast Quarter of Section 24; thence North 34°49' East 271.34 feet, thence South 65°46' East 97.1 feet, thence North 35°02' East 605.0 feet, thence South 62°06' East 589.3 feet, thence South 1316.6 feet, thence North 63°43' West 48.6 feet, thence South 29°29' West 333.4 feet, thence North 62°16' West 127.03 feet, thence North 1122.0 feet, thence West 793.35 feet to the point of beginning.

Tax ID No. 06-020-0-0013

5th: Beginning at a point 723.7 feet North of the center of Section 24, thence North 299.3 feet, thence North 34°49' East 361.76 feet, thence East 793.35 feet, to the Northeast Corner of the Stockton Town Boundary, thence South 1122.0 feet, thence North 62°16' West 1129.67 feet to the point of beginning.

Tax ID No. 01-185-0-0001

B. Those portions of **Section 25** described as follows:

1st: The E½NE¼.

Tax ID No. 06-021-0-0001

2nd: Beginning 450 feet North and 290 feet East of the Southwest Corner of the Northwest Quarter of the Northeast Quarter of Section 25; thence North 30 feet, thence East 709.90 feet, thence South 480 feet, thence West 669.90 feet, thence North 450 feet, thence West 40 feet to the point of beginning.

Tax ID No. 01-184-0-0005

3rd: Beginning at a point 870 feet South and 290 feet East of the Northwest Corner of the Northeast Quarter of Section 25; running thence East 40 feet, thence South 50.0 feet, thence West 40 feet, thence North 50.0 feet to the point of beginning.

Tax ID No. 01-184-0-0007

4th: Beginning at a point 1320 feet South of the Northwest Corner of the Northeast Quarter of Section 25; running thence East 330.0 feet, thence North 30 feet, thence West 330.0 feet, thence South 30 feet to the point of beginning.

Tax ID No. 01-184-0-0007

5th: Beginning at the Southeast Corner of the Northwest Quarter of the Northeast Quarter of Section 25; thence West 320.10 feet, thence North 480 feet, thence East 320.10 feet, thence South 480 feet to the beginning.

Tax ID No. 06-021-0-0017

6th: All of Lot 1, Hilton Subdivision, according to the official plat thereof, on file and of record in the Tooele County Recorder's office.

Tax ID No. 11-024-0-0001

7th: Beginning at a point 312.3 feet East from the Center of Section 25; running thence East along old fence line and the Center Line of Said Section 25 1007.7 feet, thence North 0°16' West 372.02 feet, thence South 79°37' West 211.37 feet; thence South 82°19'30" West 981.6 feet to the Northeasterly line of Soldier Canyon Road; thence South 40°44'30" East along said road to the point of beginning.

Tax ID No. 06-021-0-0019

C. Those portions of **Section 36** described as follows:

1st: Beginning at a point 14.78 chains South of the SE Corner of the SW¼SE¼ of Section 25; thence South 6.02 chains, thence South 33°29' East 11.62 chains, thence South 45°35' East 19.20 chains, thence South 8.75 chains, thence North 58°50" West 53.48 chains, thence North 59°15' West 19.50 chains, thence East 42.40 chains to the point of beginning.

Tax ID No. 06-026-0-0002

2nd: Beginning at a point 450 feet South of the SE Corner of the SW¼SE¼ of said Section 25; thence South 525.48 feet, thence West 2798.40 feet, thence North 975.48 feet, thence East 2415.40 feet, thence South 450 feet, thence East 383 feet to the point of beginning.

Tax ID No. 06-026-0-0002

3rd: Beginning at the Southeast Corner of Lot 2, Section 36; thence West 20 chains, Thence North 23.22 chains, thence South 59°15' East 19.5 chains, thence South 58°50' East 7 chains, thence South 12.5 chains to beginning.

Parcel No. 06-026-0-0001

4th: Beginning at the Southeast Corner of Lot 2, Section 36; thence North 89°47' 19" West 1298.52 feet, thence North 00°33'25" East 1664.52 feet, thence South 59°15'00" East 1287.00 feet, thence South 58°50'00" East 225.63 feet, thence South 1°04'31" West 894.58 feet to the point of beginning.

Parcel No. 06-026-0-0001

II. All, or portions of, those patented mining claims described below which lie substantially within **Section 24, Township 4 South, Range 5 West, Salt Lake Base and Meridian**, Tooele County, Utah, in the Rush Valley Mining District. Such property is also described as follows:

1st Beginning at the Northwest Corner of the Copper Queen No. 4 mining claim, MS 6152, thence approximately Northwest to the Southwest Corner of the Copper Queen Amended No. 2 mining claim, MS 6152, thence approximately North to the Northwest Corner of the Copper Queen Amended No. 2 mining claim, thence approximately Northwest to the Southwest Corner of the Bellevue mining claim, MS 6152, thence approximately North to the Northwest Corner of the Bellevue mining claim, thence approximately Southeast along the Northeast boundary line of the Bellevue mining claim to its intersection with the West boundary line of the Hope mining claim, MS 4946, thence approximately North to the Northwest Corner of the Hope mining claim, thence approximately North to the Northwest Corner of the Rush Amended mining claim, MS 5251, thence approximately 1,820 feet at a bearing of South 52° East to the intersection of the West boundary line of Section 19, Township 4 South, Range 4 West, SLB&M, and the North boundary line of the Union Consolidated mining claim, MS 4983 (which point is approximately 4,005 feet north of the Southwest corner of Section 19), thence approximately 676 feet South along the West boundary line of Section 19 to the intersection of the West boundary line of Section 19 and the South boundary line of the North Star mining claim, MS 135 (which point is approximately 3,329 feet north of the Southwest corner of Section 19), thence approximately 1,035 feet at a bearing of North 64° West to the Southwest Corner of the Union Consolidated mining claim, MS 4983, thence approximately 1,118 feet at a bearing of South 2° West to the Northwest Corner of the Copper Queen No. 4 mining claim, which is the point of beginning.

2nd Beginning at the Northwest Corner of the Copper Queen No. 4 mining claim, MS 6152, thence 400 feet approximately Southeast along the Northeast boundary line of the Copper Queen No. 4 mining claim, thence 679 feet due South to a point on the South boundary line of the Copper Queen No. 4 mining claim, thence 547 feet approximately Northwest to the Southwest corner of the Copper Queen No. 4 mining claim, thence approximately North to the Northwest Corner of the Copper Queen No. 4 mining claim, which is the point of beginning.

The above descriptions encompass all or a portion of each of the following mining claims:

<u>Claim Name</u>	<u>Mineral Survey No.</u>
North Star	135
Hope	4946
Union Consolidated	4983
Rush Amended	5251
Bellevue, Copper Queen Amended No. 2, and Copper Queen No. 4,	6152

APPENDIX F
SITE INVESTIGATION

**KENNECOTT UTAH COPPER
ENVIRONMENTAL RESTORATION GROUP**

**CHARACTERIZATION AND SOURCE
ASSESSMENT OF LEAD AND ARSENIC
CONTAMINATION**

**KENNECOTT STOCKTON
NORTHEAST PARCEL**

DECEMBER 2008

STZ-13



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1. INTRODUCTION

Kennecott Utah Copper Corporation (KUCC) subsidiary OM Enterprises owns property ("Kennecott Northeast Parcel" or "Kennecott Parcel") located to the immediate northeast of the town of Stockton, Utah, in a portion of Section 24, T4S, R5W, and east of State Highway 36 (Figure 1-1). This site is near the location of a historical smelter and has been investigated by the Utah Department of Environmental Quality (UDEQ) in cooperation with the United States Environmental Protection Agency (EPA) as part of the Jacobs Smelter NPL site in response to human health and ecological concerns related to elevated concentrations of lead and arsenic. (For the purpose of this investigation soil containing greater than 3,000 mg/kg lead is considered "elevated".) The Kennecott Parcel is located in an area that is directly down-gradient from historical mine workings that provided feedstock to the Stockton smelters. These mine sites have un-reclaimed and uncontrolled waste rock piles known to contain elevated concentrations of lead and arsenic.

UDEQ conducted a Contaminant Screening Study (1999), a Pre-Remedial Investigation (2001) and a Remedial Investigation (RI, 2002 to 2003). These investigations found elevated concentrations of lead and arsenic in some of the samples collected on the Kennecott Parcel. UDEQ and EPA issued a Feasibility Study Report in December 2003, a Final Revised Feasibility Study in July 2004, and a Proposed Plan for OJ2 in July 2004. Kennecott also collected soil samples from the site as part of a pre-land acquisition investigation in 1995. The Kennecott Parcel of concern was only a small part of both the UDEQ and Kennecott investigations. Neither investigation adequately characterized the Kennecott Parcel.

In July 2004, Kennecott conducted a soil characterization investigation of this parcel in order to better define the nature and extent of the contamination. Eighty-seven soil samples were collected from 26 locations. There were nine sample sites out of the 26 locations that had at least one sample with a concentration greater than 3,000 mg/kg lead. Eight of the nine sites with elevated lead were located in either a drainage bottom or an area where active deposition of sediments from these drainages is taking place.

The results of Kennecott's July 2004 investigation suggested that the elevated lead and arsenic contamination was sourced from up-gradient waste rock piles that are actively eroding and depositing waste rock on the Kennecott Parcel in two separate areas. In December 2007, EPA requested that Kennecott collect additional soil samples from the Kennecott Parcel to characterize further the site and more definitively

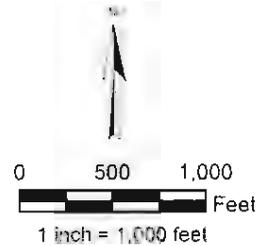
assess the source of the contamination. A sampling and analysis plan and quality assurance project plan (SAPQAPP) for this work was prepared by Kennecott and submitted to UDEQ/EPA in April 2008. The SAPQAPP was approved by UDEQ/EPA. This plan called for the collection of approximately eighteen samples from nine additional locations.

Sample collection began in July 2008; however, Kennecott expanded the SAP to include the collection of more samples from more locations than the plan called for originally. Ultimately, Kennecott collected 388 samples from 111 separate sites and defined the horizontal and vertical limits of the contaminated soil on the Kennecott Parcel.

This report describes the sampling and analytical procedures used for the collection of these additional samples and includes the data quality assurance and quality control procedures associated with this work. Included also with this report is a description of the nature, source, and extent of contaminated soil and an estimate of the volume of contaminated soil present at the site.



-  STOCKTON NORTHEAST INVESTIGATION AREA
-  KENNECOTT PROPERTY BOUNDARY
-  BLM PROPERTY



RioTinto	FIGURE 1-1 STOCKTON NORTHEAST AREA KUCC LAND POSITION	
	ENVIRONMENTAL RESTORATION GROUP	
	Drawing Number: 454-T-0370	
	 Environmental Affairs Division	Date: 11/20/03 Drawn By: J Project Mgr: KP Rev:

2. PREVIOUS WORK

Kennecott collected soil samples from the site in 1995. This work was part of a pre-acquisition investigation and included two sampling efforts. First, there was an assessment of adits, shafts, pits, trenches and dumps located up-gradient from the Kennecott Parcel. Second, surface soil samples were collected and analyzed for total concentrations of ore metals and related trace elements. Six surface soil samples were collected by Kennecott from sites within the Kennecott Parcel of concern. The lead concentrations for these samples ranged from 107 mg/kg to 2,310 mg/kg. In addition, one additional sample was collected of waste rock from an upgradient source. This sample contained 20,800 mg/kg lead and 1,020 mg/kg arsenic.

The UDEQ investigation is described in the UDEQ Final Remedial Investigation for OU2, Jacobs Smelter Site Stockton, Utah, July 2003 (RI). RI sampling activities were conducted between 1999 and 2003 and included an area much larger than the Kennecott Parcel. Eighteen soil samples were collected from nine sites located on the Kennecott Parcel from the surface (0 to 2" below surface) and below surface (2" to 12"). The samples were not collected in a systematic manner over the entire Kennecott Parcel. All but two of these samples contained lead in concentrations below 3,000 mg/kg. The other two samples contained 56,900 mg/kg and 42,400 mg/kg lead.

In July 2004, Kennecott collected eighty-seven samples from twenty-six locations (Figure 2-1). Eleven samples contained lead in concentrations greater than 3,000 mg/kg. There were nine sample sites out of the twenty-six locations that had at least one sample with a concentration greater than 3,000 mg/kg lead. Two of these locations had two samples greater than 3,000 mg/kg lead. The maximum and minimum lead concentrations for those samples greater than 3,000 mg/kg lead are 24,800 mg/kg and 5,090 mg/kg respectively and the median value is 9,410 mg/kg.

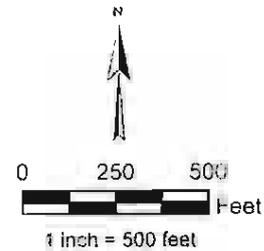
The average lead concentration of the samples with concentrations less than 3,000 mg/kg is 493 mg/kg. The maximum, minimum, and median values of these samples are 2,430 mg/kg, 44 mg/kg and 309 mg/kg respectively.

Nine of the 11 samples with lead concentrations greater than 3,000 mg/kg were collected in drainages. Four of the 11 samples were discolored light orange-brown or yellow-gray (characteristic of waste rock) and four were collected from samples that appeared to be recent alluvium that is fair to well sorted by water, fine pebbles 1/8-inch to 1/4-inch diameter.

All samples with lead greater than 3,000 mg/kg were collected from the surface soil (shallowest sample collected from the site or the two shallowest samples collected from the site). Nine of the eleven samples containing elevated lead were found between 0 and 7 inches below the surface. The other two samples were collected from 7 to 9 inches and 9 to 14 inches below surface.



- 2004 CHARACTERIZATION <3000 LEAD
- ⊙ 2004 CHARACTERIZATION > 3000 LEAD
- ▭ KUCS PROPERTY BOUNDARY
- ▭ STOCKTON NORTHEAST INVESTIGATION AREA



RioTinto	FIGURE 2-1 STOCKTON NORTHEAST AREA 2004 SOIL CHARACTERIZATION INVESTIGATION SAMPLE LOCATIONS	
	ENVIRONMENTAL RESTORATION GROUP	
	Drawing Number: 454-7-0371	
		Date: 11/26/08 Drawn By: J. Project Manager:

3. SITE DESCRIPTION

The Kennecott Parcel covers an irregularly shaped area of 81 acres (Figure 1-1). The site is located on the east side of State Highway 36 to the immediate northeast of the town of Stockton. The eastern extent of the site is located at the mouths of two canyons that continue east into the foothills of the Oquirrh Mountains. The drainage basins of these canyons include an area east of the Kennecott Parcel where historic mining activities have taken place. Tunnels, shafts, adits and waste rock piles associated with historic mining activities are visible today east of the Kennecott Parcel.

The topography at the mouths of the canyons is relatively steep and coarse material (cobbles and boulders) eroded from up gradient is visible on the surface and in the active drainage bottoms. The northern most canyon has numerous man-made drainage ditches in addition to natural drainages that are incised into this coarse alluvial fan material deposited at the mouth of the canyon. The shallow subsurface soil in both the man-made and natural drainage bottoms contains recent (post-mining) water sorted sediment that is actively moving down the drainage. This sediment contains rock eroded from waste rock piles located up-gradient. A 1959 aerial photograph (Figure 3-1)¹ acquired from the USDA show these drainages feeding the two depositional areas located further to the northwest and southwest that have been defined by this investigation to contain elevated concentrations of lead and arsenic (see Section 10-1). These drainages range in size from only a few feet across to up to 25 feet across. It is clear from field observations that water was ditched from the mouth of the canyon through both the man-made and natural drainages. Man-made ditches often parallel each other for hundreds of yards at some locations. The reason for these parallel ditches is not clear. The following sections describe the activities associated with soil removal from the Kennecott Parcel and haulage to a disposal facility.

¹ A higher-quality digital version of the 1959 aerial photograph is included as an electronic appendix to this report.



STOCKTON

HISTORIC
DITCHES

23



KUCC PROPERTY BOUNDARY
AREA CONTAINING >3000 mg/kg LEAD



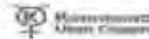
0 200 400
Feet
1 inch = 400 feet

RioTinto

FIGURE 3-1
STOCKTON NORTHEAST AREA
1966 AERIAL PHOTO

ENVIRONMENTAL
RESTORATION PROJECT

Drawing Number: 464-T-0372



Date: 11/28/2014
Drawn By: JH
Project Manager: JH
Rev:

4. SAMPLING STRATEGY AND SAMPLE LOCATIONS

The sampling strategy for this investigation was to define the limits of the contaminated soil found at two separate locations during the 2004 characterization and to determine by sampling if the man made drainages that feed these two areas contain contaminated material along their entire lengths. The two areas of contamination defined in 2004 will be referred to as the north and south areas of contamination for the purpose of this report. Three additional sites located approximately 400 feet north of the south contamination area were also sampled. These locations were sampled to confirm that no contamination is present here. No drainages feed this area and sites close to these sampled in 2004 did not contain elevated lead or arsenic.

A 100-foot by 100-foot grid was established over the north and south contamination areas using a global positioning system unit (GPS) capable of sub-meter accuracy. At each grid location, a 24-inch deep hole was excavated using a rubber-tired backhoe. Sampling began near the center of each grid where elevated concentrations of lead and arsenic were known to exist. At each grid location, three to four samples were collected. One sample was collected from 0 to 2 inches below the surface. The other samples were collected from distinct soil units where observed to a depth of 18 inches below the surface. If no identifiable soil units were present, the remaining samples were collected from 2 to 6 inches, 6 to 12 inches and 12 to 18 inches below the surface.

Sampling continued until the vertical and lateral extent of the contamination was defined. Additional deeper samples were collected at several locations where soil containing elevated lead and arsenic concentrations was found at depths greater than 18 inches below the surface. Additional sample locations between grid points were added to the southern contamination area to better define the horizontal extent.

The man-made and natural drainages that feed the north and south contaminated areas were sampled from trenches excavated across the drainages with a rubber-tired backhoe. These trenches varied in length depending on the width of the drainage. Continuous vertical channel samples were collected from up to four separate locations along the trench depending on drainage width. Sample intervals were chosen based on observed units or discoloration. Sample depths varied and were generally deeper than the grid locations because alluvial material containing elevated lead and arsenic was present to depths up to three feet below the surface.

5. SAMPLING PROCEDURES

Sampling and analytical procedures were consistent with those described in the SAPQAPP. Those procedures unique to this sampling effort are described below.

Sample ID numbers were assigned as follows:

The sample ID number began with a prefix followed by a dash and then the unique site ID number from where it was collected (Figure 5-1). If more than one sample was collected at the same location the shallowest sample collected had a -1 ending and the next deepest sample had a -2 ending and so on.

Samples ID numbers collected from the grid locations in the southern contamination area began with the prefix STZ and were followed by the numbers 12 through 91. Sample ID numbers collected from the grid locations in the northern area began with the prefix STZ and were followed by the numbers 103 through 126. An example of the sample ID number for the shallowest sample collected from site 12 is STZ-12-1 and the next deepest sample collected from site 12 is STZ-12-2 and so on.

Sample ID numbers collected from the drainage areas began with the prefix STNE . If more than one vertical channel sample location was collected from the trench excavated across the drainage, the first site ID number would be designated with an A, the second with a B and so on. So if drainage site 21 had two sample locations with four vertical channel samples collected from each location, the sample ID numbers would be STNE-21A-1 through STNE-21A-4 for one location and STNE-21B-1 through STNE-21B-4 for the second location.

Sample sites STNE1 through STNE3 were collected from an upland area north of the south contamination area and not from a drainage site. Each site had four vertical channel samples collected. Sample ID numbers for site 1 were STNE-1-1 through STNE-1-4.

Blank rinsate samples were assigned the sample ID numbers STZBR-1 through STZBR-15.

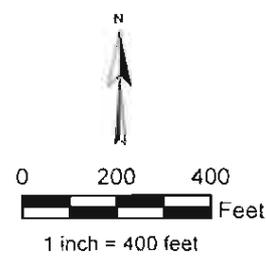
A trackhoe or hand tools were used to excavate a hole at each sample site to a depth of approximately 24 inches below the surface. Several sample sites required the hole to be deepened below 24 inches to reach the bottom of the contamination.

Descriptions of the sample sites were recorded on field log sheets. Copies of the field log sheets are included in Appendix A.

Photographs were taken of the sample sites and sampled material. Copies of the photographs are included in Appendix B.



- SAMPLE LOCATION AND ID NO. 2008 CHARACTERIZATION
- SAMPLE LOCATION AND ID NO. 2004 CHARACTERIZATION
- (at least one sample contains >5000 mg/kg LEAD)
- ⊖ AT LEAST ONE SAMPLE CONTAINS >5000 mg/kg LEAD
- ALL SAMPLES CONTAIN >5000 mg/kg LEAD
- AREAS CONTAINING >3000 mg/kg LEAD
- MAN-MADE OR NATURAL DRAINAGE THAT RECEIVED MINE WATER
- NATURAL DRAINAGE



RioTinto	FIGURE 5-1 STOCKTON NORTHEAST AREA SAMPLE LOCATIONS AND ID NUMBERS 2004 AND 2008 CHARACTERIZATIONS	
	ENVIRONMENTAL RESTORATION GROUP	
	Drawing Number: 454-T-0373	
		Date: 11/25/08 Drawn By: JJ Project Mgr: KP Rev:

6. QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Quality assurance and quality control (QA/QC) samples included split samples and equipment rinsate samples. The frequency of split samples was one for every 15 samples collected. Split samples were submitted to the primary lab for analysis. After analysis, the remaining sample material was crushed/ground to the less than the number 65 standard sieve size, homogenized and then split. One of the splits was analyzed at the primary lab and the other was sent to a secondary lab for analysis. The analytical result of the original unprepared sample is considered the reportable results and the prepared split sample analysis was used only to evaluate the precision of the laboratories.

One equipment rinsate sample was collected for every 20 soil samples collected while using non-disposable sampling implements. This sample consisted of de-ionized water poured over decontaminated sample collection devices and collected in a sample container. This sample served as a check on the quality of the decontamination process.

The primary analytical laboratory was Kennecott Environmental Laboratory (KEL) and the secondary laboratory was American West Analytical Laboratory (AWAL). Both laboratories are State certified and as such follow QA/QC procedures consistent with EPA standards. Laboratory QA/QC samples included method blanks, spiked blanks, matrix spikes, and laboratory reference samples.

7. ANALYTICAL PROCEDURES

Soil samples were analyzed at KEL for total concentrations of lead and arsenic and moisture content. The results of the analysis are reported on a dry weight basis. Split samples were analyzed at AWAL for the same analytes. KEL uses EPA Method SW-846, 3050B (acid digestion of sediments, sludge and soils) as the sample preparation method while AWAL uses preparation Method SW-846, 3051 (microwave assisted digestion of sediments, sludge and soils). KEL and AWAL both use analytical method SW-846, 6010B (inductively coupled plasma atomic emission spectrometry/ICPAES). Although the preparation methods are slightly different, recent experience has shown that both methods produce similar results.

8. SAMPLE COMPILATION

A total of 388 soil characterization samples were collected for this investigation. 224 soil samples were collected from the southern contamination area, 49 soil samples were collected from the northern contamination area and 115 soil samples were collected from drainages. A list of the samples is included in Table 1 along with the sample date, lab identification number, sample interval, description of the sampled material and the analytical results. Sample locations identified by the sample site identification numbers are shown on Figure 5-1.

Fifteen blank rinsate water samples were collected from the decontaminated sampling tools used to collect the soil samples. The samples were analyzed at KEL for total concentrations of lead and arsenic. A list of the blank rinsate samples is included in Table 2 including the sample date, lab identification number and the analytical results.

Twenty-six samples were split as part of QA/QC procedures. A list of the split samples and the analytical results for each laboratory are included in Table 3.

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-12-1	AQ11718	7/21/2008	0-2	Silty sandy gravel. No discoloration.	658	33
STZ-12-2	AQ11719	7/21/2008	2-6	Silty sandy gravel. No discoloration.	397	29
STZ-12-3	AQ11720	7/21/2008	6-12	Silty sandy gravel. No discoloration.	362	18
STZ-12-4	AQ11721	7/21/2008	12-18	Silty sandy gravel. No discoloration.	707	41
STZ-13-1	AQ11722	7/21/2008	0-2	Silty sandy gravel. No discoloration.	930	38
STZ-13-2	AQ11723	7/21/2008	2-6	Silty sandy gravel. No discoloration.	506	24
STZ-13-3	AQ11724	7/21/2008	6-12	Silty sandy gravel. No discoloration.	471	35
STZ-13-4	AQ11725	7/21/2008	12-18	Silty sandy gravel. No discoloration.	641	31
STZ-14-1	AQ11833	7/23/2008	0-2	Gravelly silt. No discoloration.	958	49
STZ-14-2	AQ11834	7/23/2008	2-6	Gravelly silt. No discoloration.	372	25
STZ-14-3	AQ11835	7/23/2008	6-12	Gravelly silt. No discoloration.	341	16
STZ-14-4	AQ11836	7/23/2008	12-18	Gravelly silt. No discoloration.	315	16
STZ-15-1	AQ11837	7/23/2008	0-2	Gravelly silt. No discoloration.	465	24
STZ-15-2	AQ11838	7/23/2008	2-6	Gravelly silt. No discoloration.	332	19
STZ-15-3	AQ11839	7/23/2008	6-12	Gravelly silt. No discoloration.	373	20
STZ-15-4	AQ11840	7/23/2008	12-18	Gravelly silt. No discoloration.	360	30
STZ-16-1	AQ11841	7/23/2008	0-2	Gravelly silt. No discoloration of sample material but there is some discoloration on surface gravel in vicinity of the sample site.	406	24
STZ-16-2	AQ11842	7/23/2008	2-6	As above.	352	21
STZ-16-3	AQ11843	7/23/2008	6-12	As above.	304	18
STZ-16-4	AQ11844	7/23/2008	12-18	As above.	311	17
STZ-17-1	AQ11895	7/24/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	772	33
STZ-17-2	AQ11896	7/24/2008	2-8	Topsoil: Gravelly sandy silt. No discoloration.	342	18

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-17-3	AQ11897	7/24/2008	8-16	Sandy silt. No discoloration.	295	16
STZ-18-1	AQ11110	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	375	19
STZ-18-2	AQ11111	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	344	19
STZ-18-3	AQ11112	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	303	15
STZ-18-4	AQ11113	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	312	14
STZ-19-1	AQ11114	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	402	26
STZ-19-2	AQ11115	7/10/2008	2-6	Gravelly silt. No discoloration.	302	20
STZ-19-3	AQ11116	7/10/2008	6-12	Gravelly silt. No discoloration.	269	18
STZ-19-4	AQ11117	7/10/2008	12-18	Gravelly silt. No discoloration.	300	17
STZ-20-1	AQ11118	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	466	23
STZ-20-2	AQ11119	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	487	23
STZ-20-3	AQ11120	7/10/2008	6-12	Gravelly silt. No discoloration.	404	21
STZ-20-4	AQ11121	7/10/2008	12-18	Gravelly silt. No discoloration.	338	22
STZ--21-1	AQ11089	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	681	31
STZ--21-2	AQ11090	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	355	22
STZ--21-3	AQ11091	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	324	18
STZ-22-1	AQ11092	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	982	37
STZ-22-2	AQ11093	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	333	19
STZ-22-3	AQ11094	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	293	15
STZ-23-1	AQ11095	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	586	26
STZ-23-2	AQ11096	7/10/2008	2-12	Gravelly sandy silt. No discoloration.	403	22
STZ-23-3	AQ11097	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	447	18
STZ-25-1	AQ11898	7/24/2008	0-2	Sandy silt. No discoloration.	2400	115
STZ-25-2	AQ11899	7/24/2008	2-6	Sandy silt. No discoloration.	582	51
STZ-25-3	AQ11900	7/24/2008	6-11	Sandy silt. No discoloration.	130	11

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-25-4	AQ11901	7/24/2008	11-18	Gravelly sandy silt. No discoloration.	379	22
STZ-26-1	AQ11122	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	12300	508
STZ-26-2	AQ11123	7/10/2008	2-6	Gravelly sandy silt. No discoloration.	10600	382
STZ-26-3	AQ11124	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	1410	56
STZ-26-4	AQ11125	7/10/2008	12-18	Gravelly sandy silt. No discoloration.	394	19
DDEDIT	AQ11126	7/10/2008	0-2	Topsoil: Gravelly sandy silt. Discolored (Fe-ox) soil 4"-6".	12500	934
DDEDIT	AQ11127	7/10/2008	2-6	Topsoil: Gravelly sandy silt. Discolored (Fe-ox) soil 4"-6".	35500	922
STZ-27-3	AQ11128	7/10/2008	6-12	Silty sandy gravel. Soil is locally discolored (Fe-ox).	19800	813
STZ-27-4	AQ11129	7/10/2008	12-18	Gravelly sandy silt. Locally discolored (Fe-ox).	5990	226
STZ-27-5	AQ13234	8/14/2008	18-28	Silty gravel. Discoloration to 28 inches.	389	23
STZ-28-1	AQ11098	7/10/2008	0-2	Topsoil: silty gravelly sand. Very weak orange-brown (Fe-ox) discoloration. Surface soil in vicinity of sample site has Fe-oxidized gravel.	45900	1010
STZ-28-2	AQ11099	7/10/2008	2-9	Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration.	64000	1180
STZ-28-3	AQ11100	7/10/2008	9-18	Gravelly sandy silt. No discoloration.	440	18
STZ-29-1	AQ11015	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration throughout this interval.	16700	611
STZ-29-2	AQ11016	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration throughout this interval.	42600	905
STZ-29-3	AQ11017	7/9/2008	6-10	6"-8": Gravelly sandy silt. Weak orange-brown (Fe-ox) discoloration. 8"-10": Gravelly sand with weak orange-brown (Fe-ox) discoloration. Fair to well sorted water deposited gravel. Gravel is less than 0.5" dia.	64100	1690

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-29-4	AQ11018	7/9/2008	10-18	Sandy silt. No discoloration. Massive. Appears to be undisturbed native soil.	1660	43
STZ-30-1	AQ11023	7/9/2008	0-2	Topsoil: Sandy silt. No discoloration.	3110	176
STZ-30-2	AQ11024	7/9/2008	2-12	Sandy silt. Massive. Small pod of orange-brown soil at 10".	8050	346
STZ-30-3	AQ11025	7/9/2008	12-18	Sandy silt. No discoloration.	497	26
STZ-31-1	AQ11019	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown discoloration.	789	32
STZ-31-2	AQ11020	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown discoloration.	391	23
STZ-31-3	AQ11021	7/9/2008	6-12	Gravelly silty sand. No discoloration.	363	20
STZ-31-4	AQ11022	7/9/2008	12-18	Gravelly silty sand. No discoloration.	359	22
STZ-32-1	AQ13193	8/14/2008	0-2	Gravelly sandy silt. No discoloration.	1570	50
STZ-32-2	AQ13194	8/14/2008	2-8	Gravelly sandy silt. No discoloration.	335	18
STZ-32-3	AQ13195	8/14/2008	8-18	Gravelly silty sand. Weak caliche in matrix. Appears to be undisturbed native soil.	314	18
STZ-33-1	AQ11902	7/24/2008	0-2	Silty sandy gravel. No discoloration.	567	33
STZ-33-2	AQ11903	7/24/2008	2-6	Silty sandy gravel. No discoloration.	141	20
STZ-33-3	AQ11904	7/24/2008	6-11	Silty sandy gravel. No discoloration.	163	23
STZ-33-4	AQ11905	7/24/2008	11-18	Silty sandy gravel. No discoloration.	216	25
STZ-34-1	AQ11223	7/11/2008	0-2	Topsoil: Gravelly silty sand. No discoloration.	7640	835
STZ-34-2	AQ11224	7/11/2008	2-6	Silty gravelly sand. No discoloration.	728	67
STZ-34-3	AQ11225	7/11/2008	6-13	Silty gravelly sand. No discoloration.	469	41
STZ-34-4	AQ11226	7/11/2008	13-21	Sandy silt. No discoloration.	648	53

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-34-5	AQ11227	7/11/2008	21-24	Clayey silt. Appears to be water deposited sediment. Bedding planes visible. Medium green with orange-brown (Fe-ox) along bedding planes.	11300	873
STZ-34-6	AQ13232	8/14/2008	24-30	Gravelly clayey silt. No discoloration.	218	13
STZ-35-1	AQ11228	7/11/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	2200	101
STZ-35-2	AQ11229	7/11/2008	2-12	Silty gravelly sand. No discoloration.	174	19
STZ-35-3	AQ11230	7/11/2008	12-18	Silty gravelly sand from 12"-16". No discoloration. 16"-18" Sandy silt. No discoloration.	210	19
STZ-36-1	AQ11026	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	7280	661
STZ-36-2	AQ11027	7/9/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	1660	152
STZ-36-3	AQ11028	7/9/2008	6-12	Gravelly sandy silt. No discoloration.	176	22
STZ-36-4	AQ11029	7/9/2008	12-18	Gravelly sandy silt. No discoloration.	163	16
STZ-37-1	AQ11030	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Possibly very weak orange-brown (Fe-ox) discoloration.	4830	226
STZ-37-2	AQ11031	7/9/2008	2-12	2"-6" Topsoil: Gravelly sandy silt. Possibly very weak orange-brown (Fe-ox) discoloration. 6"-12" Sandy silt. No discoloration.	200	20
STZ-37-3	AQ11032	7/9/2008	12-18	12"-17" Sandy silt. No discoloration. 17"-18" Silty sandy gravel. No discoloration.	236	17
STZ-38-1	AQ11033	7/9/2008	0-2	Topsoil: Gravelly sandy silt. Very weak orange-brown discoloration,	10500	560
STZ-38-2	AQ11034	7/9/2008	2-6	Topsoil: Gravelly sandy silt. Very weak orange-brown discoloration,	2010	62
STZ-38-3	AQ11035	7/9/2008	6-12	Gravelly sandy silt. No discoloration.	387	22
STZ-38-4	AQ11036	7/9/2008	12-18	Gravelly sandy silt. No discoloration.	330	19

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-39-1	AQ11037	7/9/2008	0-2	Topsoil: Gravelly silty sand: Weak orange-brown (Fe-ox).	12000	785
STZ-39-2	AQ11038	7/9/2008	2-8	2"-3" Water deposited sandy gravel. Gravel is fine. Discolored orange-brown. 3"-8" Fine, well sorted gravel (<0.5" dia.). Water sorted. Weak orange-brown discoloration throughout. Sharp lower contact.	11900	956
STZ-39-3	AQ11009	7/9/2008	8-11	Sandy gravel. Fine gravel in a sand matrix. Weak orange discoloration.	7300	286
STZ-39-4	AQ11010	7/9/2008	11-18	Sandy gravel. Well sorted fine gravel in a coarse sand matrix. Weak orange discoloration.	8190	349
STZ-39-5	AQ13196	8/14/2008	18-28	Gravelly silty sand. No discoloration.	2700	85
STZ-40-1	AQ11234	7/11/2008	0-2	Topsoil: Silty gravelly sand. No discoloration of sampled soil but there is abundant Fe-stained gravel on the surface within 50' to 75' around the sample site. Some of this surface gravel is strongly iron stained and may be waste rock.	33900	543
STZ-40-2	AQ11235	7/11/2008	2-5	As above.	4490	78
STZ-40-3	AQ11236	7/11/2008	5-18	Silty sandy gravel. No discoloration.	4040	72
STZ-40-4	AQ13197	8/14/2008	18-24	Silty sandy gravel. Strong caliche on gravel clasts and in matrix. No discoloration. Appears to be undisturbed native soil.	103	16
STZ-42-1	AQ11001	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	217	15
STZ-42-2	AQ11002	7/9/2008	2-7	Topsoil: Gravelly sandy silt. No discoloration.	141	14
STZ-42-3	AQ11003	7/9/2008	7-12	Gravelly sandy silt. No discoloration.	155	15
STZ-42-4	AQ11004	7/9/2008	12-18	Sandy gravelly silt. No discoloration.	148	15
STZ-43-1	AQ11005	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	3440	150

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-43-2	AQ11006	7/9/2008	2-6	As above.	4140	178
STZ-43-3	AQ11007	7/9/2008	6-12	Sandy silty gravel. No discoloration.	365	22
STZ-43-4	AQ11008	7/9/2008	12-18	Sandy gravelly silt. No discoloration.	231	17
STZ-44-1	AQ11130	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	4470	156
STZ-44-2	AQ11131	7/10/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	3200	113
STZ-44-3	AQ11132	7/10/2008	6-12	Gravelly sandy silt. No discoloration.	283	20
STZ-44-4	AQ11133	7/10/2008	12-18	Sandy gravelly silt. No discoloration.	170	12
STZ-45-1	AQ11011	7/9/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	7510	281
STZ-45-2	AQ11012	7/9/2008	2-6	Topsoil: Gravelly sandy silt. No discoloration.	4870	186
STZ-45-3	AQ11013	7/9/2008	6-12	Sandy silt. Massive.	9470	279
STZ-45-4	AQ11014	7/9/2008	12-18	Sandy silt. Massive.	3520	106
STZ-45-5	AQ13995	8/28/2008	18-28	Sandy gravelly silt. Caliche coating on gravel clasts.	298	22
STZ-46-1	AQ11231	7/11/2008	0-2	Topsoil: Gravelly sandy silt. Site is located in a drainage bottom. No discoloration.	6740	388
STZ-46-2	AQ11232	7/11/2008	2-8	Sandy gravel (recent alluvium) Sharp lower contact. No discoloration.	14800	692
STZ-46-3	AQ11233	7/11/2008	8-18	8"-16" Silty gravelly sand. Appears to be undisturbed native soil. No discoloration. 16"-18" Sandy silt.	7790	252
STZ-46-4	AQ13198	8/14/2008	18-28	Sandy silt. No discoloration.	4720	149
STZ-46-5	AQ13994	8/28/2008	28-38	As above.	516	24
STZ-47-1	AQ11726	7/21/2008	0-2	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	379	23
STZ-47-2	AQ11727	7/21/2008	2-6	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	707	35

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-47-3	AQ11728	7/21/2008	6-12	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	793	34
STZ-47-4	AQ11729	7/21/2008	12-18	Silty gravelly sand. No discoloration. Site is located in a drainage bottom.	292	21
STZ-48-1	AQ11821	7/23/2008	0-2	Gravelly silt. Weak discoloration of surface soil in vicinity of sample site.	190	19
STZ-48-2	AQ11822	7/23/2008	2-6	As above.	128	12
STZ-48-3	AQ11823	7/23/2008	6-12	As above.	134	12
STZ-48-4	AQ11824	7/23/2008	12-18	As above.	194	18
STZ-50-1	AQ11107	7/10/2008	0-2	Topsoil: Gravelly sandy silt. No discoloration.	871	60
STZ-50-2	AQ11108	7/10/2008	2-12	2"-5" gravelly sandy silt. No discoloration. 5"-12" Silty gravelly sand. Appears to be undisturbed native soil.	170	18
STZ-50-3	AQ11109	7/10/2008	12-18	Sandy gravel. Gravel is caliche coated.	208	20
STZ-51-1	AQ11101	7/10/2008	0-2	Topsoil: Gravelly silty sand. No discoloration.	3010	108
STZ-51-2	AQ11102	7/10/2008	2-7	As above.	113	16
STZ-51-3	AQ11103	7/10/2008	7-18	7"-14" Sandy silt. Massive. Appears to be undisturbed native soil. No discoloration. 14"-18" Gravelly sandy silt. Gravel is caliche coated. No discoloration.	92	15
STZ-52-1	AQ11104	7/10/2008	0-2	Topsoil: Silty gravelly sand. Possibly very weak orange-brown discoloration.	98	16
STZ-52-2	AQ11105	7/10/2008	2-11	Sandy gravel. Gravel is well sorted (1/8 to 1/2 inch dia.). No discoloration.	1500	238
STZ-52-3	AQ11106	7/10/2008	11-18	Sandy silt. No discoloration.	6720	355
STZ-52-4	AQ13233	8/14/2008	18-25	Sandy silty gravel. No discoloration.	101	15
STZ-53-1	AQ11825	7/23/2008	0-2	Gravelly silt. No discoloration.	887	45

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-53-2	AQ11826	7/23/2008	2-6	Gravelly silt. No discoloration.	279	23
STZ-53-3	AQ11827	7/23/2008	6-12	Gravelly silt. No discoloration.	107	16
STZ-53-4	AQ11828	7/23/2008	12-18	Gravelly silt. No discoloration.	105	13
STZ-54-1	AQ11829	7/23/2008	0-2	Gravelly silt. No discoloration.	185	17
STZ-54-2	AQ11830	7/23/2008	2-6	Gravelly silt. No discoloration.	127	21
STZ-54-3	AQ11831	7/23/2008	6-12	Gravelly silt. No discoloration.	117	15
STZ-54-4	AQ11832	7/23/2008	12-18	Gravelly silt. No discoloration.	140	35
STZ-59-1	AQ11906	7/24/2008	0-2	Silty gravelly sand. No discoloration.	721	39
STZ-59-2	AQ11907	7/24/2008	2-6	Silty gravelly sand. No discoloration.	564	34
STZ-59-3	AQ11908	7/24/2008	6-12	Silty gravelly sand. No discoloration.	263	22
STZ-59-4	AQ11909	7/24/2008	12-18	Silty sandy gravel. Strong caliche cement. No discoloration.	278	17
STZ-60-1	AQ11910	7/24/2008	0-2	Silty gravelly sand. No discoloration.	2000	89
STZ-60-2	AQ11911	7/24/2008	2-6	Silty gravelly sand. No discoloration.	221	20
STZ-60-3	AQ11912	7/24/2008	6-12	Silty gravelly sand. No discoloration.	182	21
STZ-60-4	AQ11913	7/24/2008	12-18	Silty gravelly sand. No discoloration.	178	17
STZ-61-1	AQ13202	8/14/2008	0-2	Silty gravelly sand. Site is located in a drainage bottom. This interval appears to be recent alluvium. Water sorted with weak bedding visible. No discoloration.	568	38
STZ-61-2	AQ13203	8/14/2008	2-9	As above.	174	19
STZ-61-3	AQ13204	8/14/2008	9-16	Silty sandy gravel. Appears to be alluvium. No discoloration.	116	10
STZ-67-1	AQ11629	7/18/2008	0-2	Gravelly silt. No discoloration.	451	22
STZ-67-2	AQ11630	7/18/2008	2-6	Gravelly silt. No discoloration.	377	22
STZ-67-3	AQ11631	7/18/2008	6-12	Gravelly silt. No discoloration.	334	22

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-67-4	AQ11632	7/18/2008	12-18	Silty gravel. No discoloration.	414	26
STZ-68-1	AQ12891	8/8/2008	0-2	Gravelly silt. No discoloration.	644	27
STZ-68-2	AQ12892	8/8/2008	2-6	As above.	349	18
STZ-69-1	AQ12893	8/8/2008	0-2	Gravelly silt. No discoloration.	666	31
STZ-69-2	AQ12894	8/8/2008	2-6	As above.	372	23
STZ-70-1	AQ12895	8/8/2008	0-2	Gravelly silt. No discoloration.	863	41
STZ-70-2	AQ12896	8/8/2008	2-6	As above.	361	22
STZ-71-1	AQ12897	8/8/2008	0-2	Gravelly silt. No discoloration.	563	24
STZ-71-2	AQ12898	8/8/2008	2-6	As above.	344	19
STZ-72-1	AQ12899	8/8/2008	0-2	Gravelly silt. No discoloration.	450	24
STZ-72-2	AQ12900	8/8/2008	2-6	As above.	284	21
STZ-73-1	AQ12901	8/8/2008	0-2	Sandy gravelly silt. No discoloration.	237	14
STZ-73-2	AQ12902	8/8/2008	2-6	As above.	149	12
STZ-74-1	AQ12903	8/8/2008	0-2	Gravelly silt. No discoloration.	388	22
STZ-74-2	AQ12904	8/8/2008	2-6	As above.	240	14
STZ-75-1	AQ12905	8/8/2008	0-2	Sandy silt. No discoloration.	4760	168
STZ-75-2	AQ12906	8/8/2008	2-6	As above.	2300	19
STZ-76-1	AQ12907	8/8/2008	0-2	Gravelly silt. No discoloration.	152	11
STZ-76-2	AQ12908	8/8/2008	2-6	As above.	98	11
STZ-77-1	AQ12909	8/8/2008	0-2	Gravelly sandy silt. No discoloration.	778	52
STZ-77-2	AQ12910	8/8/2008	2-6	As above.	208	22
STZ-78-1	AQ13010	8/12/2008	0-2	Silty gravelly sand. This appears to be recent alluvium possibly related to historic ditches due to close proximity to ditches although there is no discoloration.	626	35
STZ-78-2	AQ13011	8/12/2008	2-6	As above.	220	20

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-78-3	AQ13012	8/12/2008	6-12	Gravelly sandy silt. Contains pods of caliche. No discoloration. Appears to be undisturbed native soil.	121	12
STZ-79-1	AQ13013	8/12/2008	0-2	Gravelly silty sand. Possibly very weak orange discoloration. This may be recent alluvium associated with historic ditch. Weak horizontal layering locally.	5490	227
STZ-79-2	AQ13014	8/12/2008	2-12	As above.	950	46
STZ-80-1	AQ13015	8/12/2008	0-2	Gravelly sand. This may be recent alluvium deposited in a historic ditch. Possibly very weak orange discoloration in top 4".	7230	322
STZ-80-2	AQ13016	8/12/2008	2-6	As above.	7540	290
STZ-80-3	AQ13017	8/12/2008	6-9	As above.	2870	118
STZ-81-1	AQ13018	8/12/2008	0-2	Sandy gravelly silt. No discoloration.	481	27
STZ-81-2	AQ13019	8/12/2008	2-6	As above.	133	15
STZ-82-1	AQ13020	8/12/2008	0-2	Gravelly sandy silt. No discoloration. Appears to be undisturbed native soil.	358	23
STZ-82-2	AQ13021	8/12/2008	2-6	As above.	129	14
STZ-83-1	AQ13022	8/12/2008	0-2	Gravelly sandy silt. No discoloration.	991	39
STZ-83-2	AQ13023	8/12/2008	2-6	As above.	399	26
STZ-84-1	AQ13220	8/14/2008	0-2	Silty sandy gravel. No discoloration. Gravel is finer grained from 9" to 15" and better sorted. May be water sorted.	25200	225
STZ-84-2	AQ13221	8/14/2008	2-15	As above.	3530	27
STZ-84-3	AQ13993	8/28/2008	15-24	Gravel with caliche.	69	21
STZ-85-1	AQ13222	8/14/2008	0-2	Silty sandy gravel. No discoloration.	1720	60
STZ-85-2	AQ13223	8/14/2008	2-8	As above.	2390	41

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-85-3	AQ13224	8/14/2008	8-12	Silty sandy gravel. Strong caliche coating on gravel surface and in matrix material.	472	24
STZ-86-1	AQ13113	8/13/2008	0-2	Silty sandy gravel. No discoloration.	818	31
STZ-86-2	AQ13114	8/13/2008	2-8	As above.	1290	32
STZ-87-1	AQ13115	8/13/2008	0-2	Silty sandy gravel. No discoloration.	3250	76
STZ-87-2	AQ13116	8/13/2008	2-6	As above.	304	15
STZ-89-1	AQ12911	8/8/2008	0-2	Gravelly silt. No discoloration.	929	48
STZ-89-2	AQ12912	8/8/2008	2-6	As above.	501	33
STZ-90-1	AQ12913	8/8/2008	0-2	Gravelly silt. No discoloration.	11300	640
STZ-90-2	AQ12914	8/8/2008	2-6	As above.	17000	656
STZ-90-3	AQ13991	8/28/2008	6-18	Sandy clayey silt. No discoloration.	785	35
STZ-90-4	AQ13992	8/28/2008	18-26	Gravelly sandy silt. Caliche.	346	21
STZ-91-1	AQ13235	8/14/2008	0-2	Gravelly sandy clay. No discoloration.	517	34
STZ-91-2	AQ13236	8/14/2008	2-6	As above.	1390	86
STZ-91-3	AQ13237	8/14/2008	6-11	Silty gravelly sand. Water sorted material. Locally bedding visible.	2380	106
STZ-91-4	AQ13238	8/14/2008	11-18	Gravelly silty sand. Caliche on gravel surface and in matrix material. Appears to be undisturbed native soil.	113	7
STZ-103-1	AQ13228	8/14/2008	0-2	Gravelly silt. No discoloration.	2010	90
STZ-103-2	AQ13229	8/14/2008	2-5	As above.	181	16
STZ-103-3	AQ13230	8/14/2008	5-12	Gravelly silt. No discoloration.	157	14
STZ-103-4	AQ13231	8/14/2008	12-20	Sandy gravelly silt. No discoloration.	135	12
STZ-104-1	AQ13789	8/25/2008	0-4	Clayey silt. No discoloration.	11100	743
STZ-104-2	AQ13790	8/25/2008	4-8	Clayey gravelly silt. No discoloration.	466	31
STZ-104-3	AQ13791	8/25/2008	8-14	Clayey silt. No discoloration.	373	26

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-104-4	AQ13231	8/25/2008	14-20	Clayey silt with caliche.	135	12
STZ-108-1	AQ13205	8/14/2008	0-2	Sandy gravel. Alluvium. Weak bedding visible.	8440	417
STZ-108-2	AQ13206	8/14/2008	2-8	As above.	3770	151
STZ-108-3	AQ13207	8/14/2008	8-12	Silty sandy gravel. No discoloration.	294	18
STZ-109-1	AQ13208	8/14/2008	0-2	Site is located in a drainage. Gravelly sandy silt. Very weak orange color near surface.	9300	680
STZ-109-2	AQ13209	8/14/2008	2-6	As above.	1130	78
STZ-109-3	AQ13210	8/14/2008	6-12	As above.	277	18
STZ-110-1	AQ13225	8/14/2008	0-2	Gravelly silty sand. Very weak orange color at surface.	3170	120
STZ-110-2	AQ13226	8/14/2008	2-6	As above.	1270	40
STZ-110-3	AQ13227	8/14/2008	6-13	Silty sandy gravel. Predominately gravel. Caliche on gravel surface and in matrix. Appears to be undisturbed native soil.	1340	19
STZ-111-1	AQ13793	8/25/2008	0-5	Gravelly sandy silt. No discoloration.	466	29
STZ-111-2	AQ13794	8/25/2008	5-11	Silty sandy gravel. Caliche coating on gravel clasts.	210	20
STZ-111-3	AQ13795	8/25/2008	11-24	As above.	255	25
STZ-115-1	AQ13799	8/25/2008	0-8	Sandy gravelly silt. No discoloration.	7960	276
STZ-115-2	AQ13800	8/26/2008	8-16	As above.	335	26
STZ-115-3	AQ13801	8/27/2008	16-24	Silty sandy gravel. Caliche.	237	26
STZ-116-1	AQ13211	8/14/2008	0-2	Sandy gravelly silt. This interval appears to be alluvium comprised of fine gravel, sand and silt. No discoloration.	7840	295
STZ-116-2	AQ13212	8/14/2008	2-6	As above.	5900	173
STZ-116-3	AQ13213	8/14/2008	6-12	As above.	1840	42

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STZ-116-4	AQ13214	8/14/2008	12-20	Gravelly sandy silt. This may also be alluvium. No discoloration.	223	11
STZ-117-1	AQ13215	8/14/2008	0-2	Gravelly sandy silt. No discoloration.	8320	310
STZ-117-2	AQ13216	8/14/2008	2-6	Sandy gravel. This is water sorted alluvium containing fine gravel and coarse sand.	1520	71
STZ-117-3	AQ13217	8/14/2008	6-12	As above.	1210	32
STZ-117-4	AQ13218	8/14/2008	12-20	As above.	2210	45
STZ-117-5	AQ13219	8/14/2008	20-27	As above.	3800	30
STZ-117-6	AQ13996	8/28/2008	27-39	Sandy gravelly silt. No discoloration.	271	23
STZ-118-1	AQ13796	8/25/2008	0-7	Clayey gravelly silt. No discoloration.	197	41
STZ-118-2	AQ13797	8/25/2008	7-15	Silty sandy gravel. No discoloration.	279	22
STZ-118-3	AQ13798	8/25/2008	15-24	Silty sandy gravel with caliche coating.	369	24
STZ-124-1	AQ13975	8/28/2008	0-2	Sandy gravelly silt. No discoloration.	379	26
STZ-124-2	AQ13976	8/28/2008	2-7	As above.	232	18
STZ-124-3	AQ13977	8/28/2008	7-13	Sandy silty gravel. No discoloration.	258	14
STZ-124-4	AQ13978	8/28/2008	13-19	As above.	329	19
STZ-124-5	AQ13979	8/28/2008	19-28	As above.	312	21
STZ-125-1	AQ13243	8/14/2008	0-2	Gravelly sandy silt.	319	18
STZ-125-2	AQ13244	8/14/2008	2-5	As above.	230	16
STZ-125-3	AQ13245	8/14/2008	5-12	Gravelly sandy silt. Gravel is coarser than above.	235	16
STZ-125-4	AQ13246	8/14/2008	12-18	Sandy gravelly silt.	307	18
STZ-126-1	AQ13291	8/14/2008	0-2	Sandy gravelly silt. No discoloration.	461	25
STZ-126-2	AQ13292	8/14/2008	2-5	As above.	313	29
STZ-126-3	AQ13293	8/14/2008	5-13	Sandy silty gravel. Alluvium.	343	35
STZ-126-4	AQ13294	8/14/2008	13-19	Sandy gravel. No discoloration.	425	31

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-1-1	AQ11617	7/18/2008	0-2	Gravelly silt. No discoloration.	318	19
STNE-1-2	AQ11618	7/18/2008	2-6	Gravelly silt. No discoloration.	300	16
STNE-1-3	AQ11619	7/18/2008	6-12	Gravelly silt. No discoloration.	301	16
STNE-1-4	AQ11620	7/18/2008	12-18	Gravelly silt. No discoloration.	283	17
STNE-2-1	AQ11621	7/18/2008	0-2	Sandy gravelly silt. No discoloration.	343	20
STNE-2-2	AQ11622	7/18/2008	2-6	Sandy gravelly silt. No discoloration.	462	20
STNE-2-3	AQ11623	7/18/2008	6-12	Sandy gravelly silt. No discoloration.	294	21
STNE-2-4	AQ11624	7/18/2008	12-18	Sandy gravelly silt. No discoloration.	285	18
STNE-3-1	AQ11625	7/18/2008	0-2	Gravelly sandy silt. No discoloration.	229	14
STNE-3-2	AQ11626	7/18/2008	2-6	Gravelly sandy silt. No discoloration.	195	17
STNE-3-3	AQ11627	7/18/2008	6-12	Sandy gravelly silt. No discoloration.	208	17
STNE-3-4	AQ11628	7/18/2008	12-18	Sandy gravelly silt. No discoloration.	217	20
STNE-5-1	AQ11530	7/17/2008	0-6	Gravelly sandy silt. Site is located in a drainage bottom.	4890	320
STNE-5-2	AQ11531	7/17/2008	6-12	Sandy gravel. Recent alluvium. Gravel is predominately waste rock. Orange-brown and yellow discoloration.	16400	1240
STNE-7-1	AQ11532	7/17/2008	0-2	Silty sandy gravel. Recent alluvium. Locally thin lenses of fair to well sorted fine gravel (<0.5" dia.). Very minor yellow discoloration on a few small gravel clasts. Site is located in a drainage bottom.	9500	432
STNE-7-2	AQ11533	7/17/2008	2-6	As above.	9980	1220
STNE-7-3	AQ11534	7/17/2008	6-12	As above.	2950	157
STNE-8-1	AQ11535	7/17/2008	0-2	Gravelly sandy silt with locally thin lenses of well sorted fine gravel (<0.5" dia.). Some gravel is Fe-oxidized on the surface.	9050	582
STNE-8-2	AQ11536	7/17/2008	2-10	As above.	17800	676

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-8-3	AQ11537	7/17/2008	10-16	Sandy gravel. Recent alluvium comprised of waste rock. Gravel is fair sorted (0.25" to 1" dia.). Weak orange and yellow discoloration.	12400	671
STNE-10A-1	AQ13525	8/20/2008	0-2	Gravelly sandy silt. Weak bedding in sand and silt locally. This may be recent alluvium. No discoloration.	1450	56
STNE-10A-2	AQ13526	8/20/2008	2-6	As above.	1640	60
STNE-10A-3	AQ13527	8/20/2008	6-9	Similar to above except more gravel.	459	28
STNE-10A-4	AQ13528	8/20/2008	9-15	Gravelly sandy silt. No discoloration. This appears to be undisturbed native soil.	339	22
STNE-10B-1	AQ13529	8/20/2008	0-2	Site is located in center of current day drainage. Alluvium comprised of fine gravel, sand and silt. Weak orange discoloration and moderate orange discoloration at 8" to 10".	4430	373
STNE-10B-2	AQ13530	8/20/2008	2-10	As above.	7560	622
STNE-10B-3	AQ13531	8/20/2008	10-17	Gravelly silty sand but appears to be recent alluvium. Contains a few "specs" of orange color. Gravel is fine.	9530	400
STNE-10B-4	AQ13532	8/20/2008	17-20	Sandy gravel. Gravel is fair sorted. No discoloration.	2100	89
STNE-10B-5	AQ13533	8/20/2008	20-26	Sandy silt. Massive. Appears to be undisturbed native soil.	326	17
STNE-10C-1	AQ13534	8/20/2008	0-2	Alluvium comprised of gravel, sand and silt. No discoloration.	2920	74
STNE-10C-2	AQ13535	8/20/2008	2-8	Alluvium comprised of gravel, sand and silt. Bedding visible from 4" to 8". No discoloration.	2180	71
STNE-10C-3	AQ13536	8/20/2008	8-14	Sandy silt. Massive. Appears to be undisturbed native soil.	384	22

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-12A-1	AQ13537	8/20/2008	0-2	Gravelly silty sand. May be recent alluvium. Very weak orange color in top 5".	6670	319
STNE-12A-2	AQ13538	8/20/2008	2-8	As above.	14100	595
STNE-12A-3	AQ13539	8/20/2008	8-15	Silty sandy gravel. Appears to be alluvium. Gravel is fair sorted. No discoloration.	658	35
STNE-12A-4	AQ13540	8/20/2008	15-21	Sandy silt. Massive. Appears to be undisturbed native soil.	278	15
STNE-12B-1	AQ13541	8/20/2008	0-2	Silty sandy gravel. Alluvium. No discoloration. Gravel is fair sorted.	2630	88
STNE-12B-2	AQ13542	8/20/2008	2-9	As above.	1180	79
STNE-12B-3	AQ13543	8/20/2008	9-15	Sandy silt. Massive. Appears to be undisturbed native soil.	458	21
STNE-12C-1	AQ13544	8/20/2008	0-2	Site is located in the center of the present day drainage. Sandy gravel. Appears to be alluvium although not necessarily recent alluvium. Gravel is fair sorted.	2770	118
STNE-12C-2	AQ13545	8/20/2008	2-8	As above.	476	29
STNE-12C-3	AQ13546	8/20/2008	8-14	Silty sand. Massive. Appears to be undisturbed native soil.	324	20
STNE-14A-1	AQ13560	8/20/2008	0-6	Site is located in center of present day drainage. Sandy silt. Weak bedding. Weak orange discoloration.	67400	16300
STNE-14A-2	AQ13561	8/20/2008	6-12	Silty sandy gravel. Gravel coated with caliche.	2630	97
STNE-15A-1	AQ13547	8/19/2008	0-7	Silty sandy gravel. No discoloration.	596	31
STNE-15A-2	AQ13548	8/19/2008	7-13	As above.	313	26
STNE-15A-3	AQ13549	8/19/2008	24-28	As above.	348	39

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-16A-1	AQ13550	8/20/2008	0-2	Sandy gravelly silt. Waste rock visible. Bedding visible locally.	12800	659
STNE-16A-2	AQ13551	8/20/2008	2-8	As above.	2880	193
STNE-16A-3	AQ13552	8/20/2008	8-18	Sandy gravelly silt. Caliche. No discoloration.	359	20
STNE-16B-1	AQ13553	8/20/2008	0-6	Site is located in berm between two parallel drainage ditches. Gravelly sandy silt. No discoloration.	3970	143
STNE-16B-2	AQ13554	8/20/2008	8-18	Sandy silt. No discoloration.	357	20
STNE-16C-1	AQ13555	8/20/2008	0-7	Sandy silt. Contains waste rock.	9470	869
STNE-16C-2	AQ13556	8/20/2008	7-13	Gravelly sandy silt. Caliche on gravel surfaces.	451	27
STNE-16C-3	AQ13557	8/20/2008	13-19	As above.	429	25
STNE-16D-1	AQ13558	8/20/2008	0-4	Site is located on north side of northern-most drainage ditch. Gravelly sandy silt. No discoloration.	453	29
STNE-16D-2	AQ13559	8/20/2008	4-10	Gravelly sandy silt. Caliche. No discoloration.	346	17
STNE-17A-1	AQ13467	8/19/2008	0-6	Sandy gravelly silt. Gravel is fair sorted. No discoloration.	7450	307
STNE-17A-2	AQ13468	8/19/2008	6-13	Silty sandy gravel. Massive. Some waste rock visible.	8540	245
STNE-17A-3	AQ13469	8/19/2008	13-20	Silty sandy gravel. Imbricate structures.	481	38
STNE-17A-4	AQ13470	8/19/2008	20-26	As above.	452	29
STNE-17B-1	AQ13471	8/19/2008	0-3	Site is located on berm between two drainage ditches. Sandy gravelly silt. Gravel is fair sorted.	2210	114
STNE-17B-2	AQ13472	8/19/2008	3-10	Silty sandy gravel. Poorly sorted. Massive. Caliche.	485	31
STNE-17B-3	AQ13473	8/19/2008	10-18	As above.	448	24
STNE-17B-4	AQ13474	8/19/2008	18-24	As above.	398	23
STNE-17C-1	AQ13475	8/19/2008	0-6	Gravelly sandy silt. Poorly sorted.	1660	98
STNE-17C-2	AQ13476	8/19/2008	6-14	Silty sandy gravel. Caliche coating on gravel surface.	507	30

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-17C-3	AQ13477	8/19/2008	14-20	As above.	375	23
STNE-17C-4	AQ13478	8/19/2008	30-36	Gravelly sand. Weak orange color.	553	55
STNE-18A-1	AQ13321	8/15/2008	0-6	Site is located in a drainage bottom that is approx. 6 feet deep and 25 feet across. Silty sandy gravel. Alluvium. Gravel is fair to well sorted and fine. Bedding visible. Weak orange discoloration.	17200	873
STNE-18A-2	AQ13322	8/15/2008	6-11	As above except orange and yellow discoloration is moderate.	15900	384
STNE-18A-3	AQ13323	8/15/2008	11-16	As above.	16800	1190
STNE-18A-4	AQ13324	8/15/2008	16-27	Silty sandy gravel. Bedding is weak to locally non-existent. Gravel is coarser than above. Very weak orange discoloration.	3220	97
STNE-18A-5	AQ13325	8/15/2008	27-33	As above.	907	33
STNE-18B-1	AQ13326	8/15/2008	0-8	Gravelly sandy silt. Weak horizontal bedding visible. Weak orange discoloration.	20300	1110
STNE-18B-2	AQ13327	8/15/2008	8-14	Silty sandy gravel. Poorly sorted. No discoloration.	481	25
STNE-18B-3	AQ13328	8/15/2008	14-23	Sandy gravel. Alluvium. Water sorted. Bedding clearly visible. No discoloration.	735	54
STNE-18B-4	AQ13329	8/15/2008	23-30	Silty sandy gravel. Moderate caliche on gravel surfaces below 30".	383	19
STNE-19A-1	AQ13482	8/19/2008	0-2	Gravelly silty sand. Alluvium. Weak horizontal bedding visible. Weak orange discoloration.	11600	680
STNE-19A-2	AQ13483	8/19/2008	2-6	As above.	24100	1260
STNE-19A-3	AQ13484	8/19/2008	6-12	Gravelly silty sand. Massive. No discoloration.	1310	82
STNE-19A-4	AQ13485	8/19/2008	12-25	As above.	607	37

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-19A-5	AQ13505	8/28/2008	25-36	Silty gravel. White caliche coating on gravel clasts and in matrix.	296	20
STNE-19B-1	AQ13479	8/19/2008	0-2	Gravelly silty sand. Weak orange discoloration. Massive.	2160	115
STNE-19B-2	AQ13480	8/19/2008	2-9	As above.	253	20
STNE-19B-3	AQ13481	8/19/2008	9-21	Silty sandy gravel. No discoloration.	253	20
STNE-19C-1	AQ13486	8/19/2008	0-2	Gravelly silty sand. Appears to be recent alluvium mixed with colluvium. Weak orange discoloration.	10600	681
STNE-19C-2	AQ13487	8/19/2008	2-6	As above.	11800	755
STNE-19C-3	AQ13488	8/19/2008	6-12	Silty gravelly sand. No discoloration.	349	34
STNE-19C-4	AQ13489	8/19/2008	12-30	As above.	280	17
STNE-20-1	AQ13490	8/19/2008	0-2	Gravelly silty sand. No discoloration. Weak bedding visible locally. Appears to be a mixture of recent alluvium and colluvium.	3850	84
STNE-20-2	AQ13491	8/19/2008	2-9	As above.	2660	63
STNE-20-3	AQ13492	8/19/2008	9-16	Sandy silty gravel. No discoloration. No bedding visible.	15200	345
STNE-20-4	AQ13493	8/19/2008	16-24	Silty sandy gravel. Caliche coating on gravel clasts and in matrix. Appears to be undisturbed native soil.	358	35
STNE-21A-1	AQ13494	8/19/2008	0-2	Gravelly silty sand. Weak to moderate orange-brown discoloration. This appears to be recent alluvium. Bedding is clearly visible.	15700	1090
STNE-21A-2	AQ13495	8/19/2008	2-7	As above.	20800	1340
STNE-21A-3	AQ13496	8/19/2008	7-17	Similar to above with less discoloration.	20800	709

Table 8-1 Sampling and total lead and arsenic analytical data for soil characterization samples collected from the Stockton Northeast area. Results reported in dry weight. Highlighted values exceed 3,000 mg/kg lead

SAMPLE ID NO.	KEL ID NO.	SAMPLE DATE	SAMPLE INTERVAL DEPTH BELOW SURFACE (IN)	DESCRIPTION	LEAD (mg/kg)	ARSENIC (mg/kg)
STNE-21A-4	AQ13497	8/19/2008	17-22	Gravelly silty sand. Weak bedding locally to locally massive. No discoloration.	7290	190
STNE-21A-5	AQ13990	8/28/2008	22-32	Silty sandy gravel. Weak orange tint locally.	2770	126
STNE-21B-1	AQ13498	8/19/2008	0-2	Silty sandy gravel. Weak orange discoloration in top two inches. No bedding visible.	2590	118
STNE-21B-2	AQ13499	8/19/2008	2-13	As above with no discoloration.	747	44
STNE-21B-3	AQ13500	8/19/2008	13-24	Sandy gravel. Alluvium. Weak bedding locally. Gravel is fair to well sorted by water.	303	17
STNE-22A-1	AQ13562	8/19/2008	0-8	Sandy gravelly silt. No discoloration.	4220	101
STNE-22A-2	AQ13563	8/19/2008	8-14	Silty sandy gravel. No discoloration.	347	24
STNE-23A-1	AQ13564	8/19/2008	0-8	Sandy silty gravel. Weak orange discoloration.	15400	179
STNE-23A-2	AQ13565	8/19/2008	8-16	Sandy silty gravel. Caliche.	737	35
STNE-24A-1	AQ13980	8/28/2008	0-2	Sandy silt. Weak bedding visible.	12500	456
STNE-24A-2	AQ13981	8/28/2008	2-6	As above.	14500	495
STNE-24A-3	AQ13982	8/28/2008	6-18	Gravelly sandy silt. Bedding visible with weak orange discoloration.	15400	681
STNE-24A-4	AQ13983	8/28/2008	18-24	Silty sandy gravel. Caliche coating on gravel clasts.	272	18
STNE-24A-5	AQ13984	8/28/2008	24-33	As above.	225	13
STNE-24B-1	AQ13985	8/28/2008	0-2	Sandy gravelly silt. No discoloration.	1160	52
STNE-24B-2	AQ13986	8/28/2008	2-7	As above.	260	22
STNE-24B-3	AQ13987	8/28/2008	7-13	Silty sandy gravel. Caliche coating on gravel clasts.	287	22
STNE-24B-4	AQ13988	8/28/2008	13-24	As above.	374	29

Table 8-2 Blank rinsate water sample analytical results

SAMPLE ID NO.	SAMPLE DATE	LEAD (ug/L)	ARSENIC (ug/L)
STZBR-1	7/10/2008	<5	<5
STZBR-2	7/10/2008	<5	<5
STZBR-3	7/10/2008	<5	<5
STZBR-4	7/17/2008	<5	<5
STZBR-5	7/17/2008	<5	<5
STZBR-6	7/17/2008	<5	<5
STZBR-7	8/8/2008	<5	<5
STZBR-8	8/8/2008	<5	<5
STZBR-9	8/8/2008	<5	<5
STZBR-10	8/14/2008	<5	<5
STZBR-11	8/14/2008	<5	<5
STZBR-12	8/14/2008	<5	<5
STZBR-13	8/19/2008	<5	<5
STZBR-14	8/19/2008	<5	<5
STZBR-15	8/19/2008	<5	<5

Table 8-3 Comparison of split soil sample analytical data using the relative percent difference (RPD)

SAMPLE ID NO.	KEL Pb (mg/kg)	KEL As (mg/kg)	AWAL Pb (mg/kg)	AWAL As (mg/kg)	RPD (%) Pb	RPD (%) As
STNE-1-1	325	17	320	18	1.55	-5.71
STNE-17C-1	2060	114	1900	110	8.08	3.57
STNE-18A-1	17500	1000	18000	1000	-2.82	0.00
STNE-19A-1	11600	713	11000	700	5.31	1.84
STNE-20-1	3410	75	3100	76	9.52	-1.32
STNE-7-1	5830	235	5300	240	9.52	-2.11
STZ-110-1	3250	124	3700	140	-12.95	-12.12
STZ-116-4	241	16	220	13	9.11	20.69
STZ-125-1	310	16	290	16	6.67	0.00
STZ-14-1	776	39	780	41	-0.51	-5.00
STZ-19-4	279	16	260	14	7.05	13.33
STZ-25-1	2820	134	2800	150	0.71	-11.27
STZ-29-1	24100	933	22000	950	9.11	-1.81
STZ-30-1	2750	170	2900	190	-5.31	-11.11
STZ-37-1	3030	148	2800	150	7.89	-1.34
STZ-37-2	261	19	250	15	4.31	23.53
STZ-39-3	7780	349	8700	380	-11.17	-8.50
STZ-43-1	3050	142	3300	160	-7.87	-11.92
STZ-45-4	3040	96	3000	100	1.32	-4.08
STZ-47-2	674	30	610	26	9.97	14.29
STZ-51-1	3050	115	3000	120	1.65	-4.26
STZ-54-4	124	16	110	15	11.97	6.45
STZ-70-1	826	39	830	40	-0.48	-2.53
STZ-78-1	679	36	680	41	-0.15	-12.99
STZ-89-1	882	42	850	43	3.70	-2.35
STZ-91-3	1350	65	1400	67	-3.64	-3.03

9. DATA REVIEW, VALIDATION, VERIFICATION AND USABILITY

The data generated from this investigation were reviewed to determine if it is valid and usable. Sample descriptions and locations were compared to the analytical results to determine if the reported results were consistent with field observations. Observations pertaining to discoloration and environment of deposition including soil texture, sorting, bedding and visible disturbance were particularly useful in validating the analytical data. In all cases discolored soil contained elevated concentrations of lead and arsenic. The highest concentrations of lead and arsenic were consistently found in water deposited and bedded alluvium that was discolored either orange brown or less often yellow-gray. These soils often contained visible waste rock eroded from up-gradient sources and re-deposited in drainages or depositional areas fed by drainages. At most sample locations where contamination was found, concentrations were highest at or near the surface and contained lower concentrations of lead and arsenic at depth. Sample sites located in areas not in the path of up-gradient waste rock/water sources did not contain elevated concentrations of contaminants. Although not all field descriptions could accurately predict the presence of contamination generally speaking the field observations were more or less consistent with the analytical data and are considered valid and usable.

Split sample analytical data were evaluated by calculating the relative percent difference (RPD). The highest RPD for the twenty-six lead analyses is 12.95% and the average RPD for the lead analyses is 5.86%. The highest RPD for the arsenic analyses is 23.53% and the average RPD for the arsenic analyses is 7.12%. All data are less than the 35% data quality objective and are considered acceptable.

The RPD data are listed in Table 3. Copies of the laboratory analytical certificates are included in Appendix D of this report.

Laboratory quality control reports were reviewed for every sample. The reports include analytical data for the original sample, a lab duplicate sample, a matrix spike sample, a blank sample, a spiked blank sample and a reference sample. Copies of the laboratory quality control reports are included in Appendix D of this report.

Given the inherent non-homogenous nature of unprepared soil samples and the effect of matrix interferences, the original and the lab duplicate analytical results in some cases were not close as were the spike recoveries for the spiked original samples. In addition the lead and arsenic

concentrations of the original samples were often greater than 5 times the spiked concentration invalidating the use of spike recovery as a method of determining laboratory precision. However, the analytical results for the blank, spiked blank and reference samples were for the same laboratory runs, within data quality objectives. For these reasons, only the results of the blanks, spiked blanks and reference samples were used to determine the laboratory data quality.

The percent recovery objective for spiked blank samples is +/- 10%. The laboratory's percent recovery objective for reference samples is based on the manufacturer's performance acceptance limits. The certified concentration for the lead reference sample is 120 mg/kg and the performance acceptance limits for lead is 94.1 mg/kg to 145 mg/kg. The certified concentration for the arsenic reference sample is 151 mg/kg and the performance acceptance limits for arsenic is 116 mg/kg to 186 mg/kg.

There were thirty-two laboratory runs associated with the soil samples collected from this investigation. Eleven of the thirty two blank samples had detectable lead above the reporting limit of 3 mg/kg. All except one of these samples reported less than 9 mg/kg lead. No arsenic was detected in any of the thirty-two blank samples above the reporting limit of 4 mg/kg. Given the relatively high lead concentrations found in the samples collected for this investigation, the small amount of lead detected in the blank samples would have little affect on the overall reported results. In addition, most of the analytical results for the samples collected are either far above or far below the site action level of 3,000 mg/kg. For this reason this data are considered acceptable.

The spiked blank sample recoveries ranged from 91% to 103% for arsenic and 91% to 108% for lead. These values are within the data quality objective of +/- 10% and are therefore considered acceptable.

A laboratory reference sample was analyzed with every sample run. The arsenic concentrations for all thirty-two reference samples ranged from 137 mg/kg to 159 mg/kg. The lead concentrations ranged from 105 mg/kg to 126 mg/kg. All results are within the manufacturer's performance acceptance limits mentioned above and are considered acceptable.

Fifteen blank rinsate samples were collected to determine the quality of the decontamination process used for all re-usable sampling tools. None of the samples contained lead or arsenic in concentrations above the detection limits of 5 ug/L for lead or arsenic.

10. DISCUSSION

The following sections include a description of the nature and extent of the contaminated soil found at the Stockton Northeast site. Also included are the calculated volumes of contaminated soil and the additional amount of underlying soil that would need to be removed to achieve a post removal surface of less than 3,000 mg/kg lead.

10.1 Nature and Extent of Contamination

The horizontal extent of the contamination in both the northern and southern contamination areas are diagrammed on Figures Figure 5-1 and Figure 10-1 along with the location of both the natural and man-made drainages that contain soil elevated in lead and arsenic.

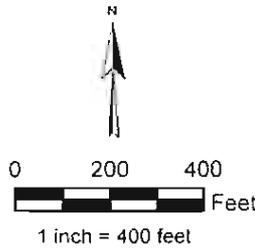
The southern contamination site is an irregularly shaped area covering 3.9 acres. There were 49 samples collected within the site from 23 separate locations that contained lead in concentrations greater than 3,000 mg/kg. Lead concentrations of these 49 samples range from 3,010 mg/kg to 64,100 mg/kg and average 13,213 mg/kg. The median lead concentration is 7,590 mg/kg. Arsenic concentrations from these same 49 samples range from 27 mg/kg to 1,690 mg/kg and average 457 mg/kg. The median arsenic concentration is 334 mg/kg. The depth of contaminated soil in the southern contamination site ranges from 2 inches below the surface to 28 inches below the surface and averages 9 inches.

The northern contamination site covers an area of 1.46 acres. This site was defined by ten samples containing greater than 3,000 mg/kg lead collected from seven separate locations. The lead concentrations of these ten samples ranged from 3,170 mg/kg to 11,100 mg/kg and averaged 6,960 mg/kg. The median lead concentration is 7,900 mg/kg. Arsenic concentrations of these same ten samples range from 30 mg/kg to 743 mg/kg and average 320 mg/kg. The median arsenic concentration is 286 mg/kg. The depth of contamination ranges from 2 inches below the surface to 27 inches below the surface and average 7.4 inches.

Discolored soil is clearly visible on the surface and at depth at both the northern and southern contamination areas. Discoloration is often visible as orange-brown iron oxidation staining and less often yellow-brown. All samples collected of discolored soil contained lead in concentrations greater than 3,000 mg/kg; however, often non-discolored soil also contained elevated lead.



- SAMPLE LOCATION AND HIGHEST LEAD CONCENTRATION mg/kg, 2004 CHARACTERIZATION
- SAMPLE LOCATION AND HIGHEST LEAD CONCENTRATION mg/kg, 2006 CHARACTERIZATION
- (Symbol with horizontal lines) (Symbol with vertical lines) (Symbol with diagonal lines) (Symbol with cross-hatch) (Symbol with dots) (Symbol with squares) (Symbol with triangles) (Symbol with circles) (Symbol with diamonds) (Symbol with stars) (Symbol with pluses) (Symbol with asterisks) (Symbol with crosses) (Symbol with hash marks) (Symbol with percent signs) (Symbol with ampersands) (Symbol with at signs) (Symbol with dollar signs) (Symbol with pound signs) (Symbol with yen signs) (Symbol with euro signs) (Symbol with dollar signs)
- ⊙ AT LEAST ONE SAMPLE CONTAINS >3000 mg/kg LEAD
- ALL SAMPLES CONTAIN <3000 mg/kg LEAD
- AREA CONTAINING >3000 mg/kg LEAD
- - - MAN-MADE OR NATURAL DRAINAGE THAT RECEIVED MINE WATER
- NATURAL DRAINAGE



RioTinto	FIGURE 10-1 STOCKTON NORTHEAST AREA SAMPLE LOCATIONS AND HIGHEST LEAD CONCENTRATIONS 2004 AND 2006 CHARACTERIZATIONS	
	ENVIRONMENTAL RESTORATION GROUP	
	Drawing Number: 404-T-0374	
	 RioTinto Global Operator	Date: 11/20/06 Drawn By: J Project Mgr: KP Rev:

There are approximately 9,500 lineal feet of both natural and man-made drainages identified in this investigation that contain soil with lead concentrations greater than 3,000 mg/kg. Based on field observations and analysis of samples collected from these drainages, it appears that water was discharged down these drainages and this water carried waste rock from up-gradient sources. The source of the water is not known but presumably is from dewatering of historic mine workings located up-gradient. The waste rock was deposited in the drainages as well as in both sites identified by this investigation as the northern and southern contamination areas.

The man-made drainages vary in size from several feet across to 25 feet across. Locally there are sections where multiple drainages parallel each other and are separated by less than 10 feet. There are several sections of drainages that appear to have been a natural drainage that was used to channel mine water that was diverted slightly to parallel the original natural course.

The drainages that fed the northern contamination area appear to terminate at the up-gradient end however there is evidence that water did continue through the northern contamination area and flow northwest down a drainage located at sample site STZ-108 (Figure 5-1).

There is one main drainage that fed the southern contamination area although this drainage locally branches into up to four parallel and sub-parallel drainages. This drainage flowed through the east side of the southern contamination area and is shown to continue in a southwest direction on the 1959 aerial photograph (Figure 3-1). This drainage is visible only locally today where it flowed through the southern contamination area. This may be due in part to a road that is present at this location today. It appears that water in these parallel drainages may have breached the banks in the southern contamination area and flowed west in sheet wash manner carrying waste rock with it. Water deposited waste rock is clearly visible on the surface and at depth today at this location.

One other drainage that sub parallels the above-mentioned drainage that fed the southern contamination area contains soil in concentrations greater than 3,000 mg/kg. This drainage trends southwest and passes north of the southern contamination area. This drainage does not appear to have been a source of waste rock to the southern contamination area and the contamination in this drainage is confined to the drainage itself.

The drainages were sampled from trenches excavated perpendicular to the drainage axis. In order to determine if contamination was present across the entire width of the drainage it was necessary to collect samples from multiple locations where the drainage was wide or where there were

parallel drainages. Contamination was found in at least one sample at every drainage sample location however not from every sample site indicating that contamination is not continuous across the entire width.

The depth of contamination in the drainages varied greatly. Contamination depths ranged from 2 to 27 inches and averaged 11 inches below the surface. Most drainages contain discolored alluvial material that in all samples indicated elevated lead and arsenic concentrations however often non-discolored alluvial material also was contaminated.

10.2 Estimate of Contaminated Soil and Removal Volume

The southern contamination area covers an area of 3.9 acres. The depth of contaminated soil in the southern contamination site ranges from 2 inches below the surface to 28 inches below the surface and averages 9 inches. Using 9 inches as an average depth this site contains approximately 4,700 cubic yards of contaminated soil.

The northern contamination area covers an area of 1.46 acres. The depth of contaminated soil found at the site ranges from 2 to 27 inches below the surface and averages 7 inches. Using 7 inches as an average depth this site contains approximately 1,400 cubic yards of contaminated soil.

The volume of contaminated soil found at both sites does not accurately reflect the volume of soil that will need to be removed because of the coarse nature of the soil. Most of the soil is poorly sorted with clast size ranging from silt to boulders. The amount of underlying soil that would need to be removed to achieve a post removal surface of less than 3,000 mg/kg lead could be as much as 6 inches. Using 6 inches of over-excavation for both the south and north areas would result in approximate removal volumes of 7,900 cubic yards for the north area and 2,600 cubic yards for the south area.

There are approximately 9,500 lineal feet of both natural and man-made drainages identified in this investigation that contain soil with lead concentrations greater than 3,000 mg/kg. The depth of contamination varied greatly at each drainage site sampled as did the drainage width making calculating a volume of contaminated soil in the drainages difficult. To calculate an average volume of contaminated soil per lineal foot of a given length of drainage, a volume was assigned based on the sample/analytical data and field observations. These assigned volumes varied from 0.25 cubic yards to 2.0 cubic yards of soil per lineal foot and include over excavation volumes. The volume of contaminated soil based on these estimates totals 8,200 cubic yards using a combined total of 9,500 lineal feet of drainages. Due to the great variability in the width and depth of the contamination this estimate should be used with caution.

