UNITED STATES DEPARTMENT OF JUSTICE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION 8
AND
THE STATE OF UTAH

IN THE MATTER OF: **Richardson Flat Tailings Superfund Site Operable Unit 1** **LHM DEV RIH LLC** Purchaser	CERCLA Docket No. CERCLA-08-2026-0002 ADMINISTRATIVE SETTLEMENT AGREEMENT FOR RESPONSE ACTION BY BONA FIDE PROSPECTIVE PURCHASER

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I. GENERAL PROVISIONS

1. This Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser ("Settlement") is entered into voluntarily by the United States of America ("United States") on behalf of the United States Environmental Protection Agency ("EPA"), the Utah Department of Environmental Quality ("DEQ"), and the purchaser, LHM DEV RIH LLC ("Purchaser"). This Settlement provides for the performance of a response action by Purchaser and the payment for certain response costs incurred by the United States at or in connection with certain real property generally known as parcels SS-87 and SS-88, in Summit County, Utah ("Property," as defined more particularly below).

2. This Settlement is entered into under the authority of the Attorney General to compromise and settle claims of the United States, consistent with the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). EPA is proceeding under the CERCLA authority vested in the President of the United States and delegated to the Administrator of EPA and further delegated to the undersigned Regional official. This Settlement is also entered into under the authority of the Executive Director of DEQ to enter into CERCLA agreements on behalf of the State of Utah ("State") pursuant to the Utah Hazardous Substances Mitigation Act, Utah Code § 19-6-301 *et seq.* ("HSMA").

3. The Purchaser represents that it is a bona fide prospective purchaser ("BFPP") as meeting the criteria in sections 101(40) and 107(r)(1) of CERCLA, that it has and will continue to comply with sections 101(40) and 107(r)(1) during its ownership of the Property, and thus qualifies for the protection from liability under CERCLA set forth in section 107(r)(1) of CERCLA with respect to the Property. The Purchaser agrees to undertake all actions required by this Settlement. In exchange for Purchaser's performance of the Work and payment for certain response costs, this Settlement resolves Purchaser's potential CERCLA liability in accordance with the covenants not to sue in Section XVI (Covenants by United States and the State), subject to the reservations and limitations contained in Section XVI. This Settlement is fair, reasonable, in the public interest, and consistent with CERCLA and HSMA.

4. The United States, State, and Purchaser (collectively, the "Parties" and individually a "Party") recognize that this Settlement has been negotiated in good faith and that the actions undertaken by Purchaser in accordance with this Settlement do not constitute an admission of any liability. Purchaser does not admit and it retains the right to controvert in any subsequent proceedings, other than proceedings to implement or enforce this Settlement, the validity of the statement of facts and determinations in Sections IV (Statement of Facts) and V (Determinations). Purchaser agrees not to contest the basis or validity of this Settlement or its terms, or the United States' or State's right to enforce this Settlement.

II. PARTIES BOUND

5. This Settlement is binding upon the United States, the State, and upon Purchaser and its successors. Unless the United States otherwise consents, any change in ownership or corporate or other legal status of Purchaser does not alter Purchaser's responsibilities under this

Settlement. Except as provided in ¶ 51, Transfer of the Property or any portion thereof does not alter any of Purchaser's obligations under this Settlement. Purchaser's responsibilities under this Settlement cannot be assigned except under ¶ 53 (Obligations Upon Title Transfer) or a modification executed in accordance with ¶ 105.

6. Purchaser shall provide notice of this Settlement to officers, directors, employees, agents, contractors, subcontractors, or any person representing Purchaser with respect to the Property or the Work. Purchaser is responsible for ensuring that such persons act in accordance with the terms of this Settlement.

III. DEFINITIONS

7. Terms not otherwise defined in this Settlement have the meanings assigned in CERCLA or in the regulations promulgated under CERCLA. Whenever the terms set forth below are used in this Settlement, the following definitions apply:

"BFPP" means a bona fide prospective purchaser meeting the criteria in sections 101(40) and 107(r)(1) of CERCLA, 42 U.S.C. §§ 9601(40), 9607(r)(1).

"CERCLA" means the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

"Day" or "day" means a calendar day. In computing any period under this Settlement, the day of the event that triggers the period is not counted and, where the last day is not a working day, the period runs until the close of business of the next working day. "Working day" means any day other than a Saturday, Sunday, or federal or State holiday.

"DEQ" means the State of Utah Department of Environmental Quality.

"DOJ" means the United States Department of Justice.

"Effective Date" means the effective date of this Settlement as provided in Section XXVIII.

"EPA" means the United States Environmental Protection Agency.

"Existing Contamination" means:

a. any hazardous substances, pollutants or contaminants present or existing on or under the Property prior to or as of the Effective Date;

b. any hazardous substances, pollutants or contaminants that migrated from the Property prior to the Effective Date; and

c. any hazardous substances, pollutants or contaminants present or existing at the Site as of the Effective Date that migrate onto, under or from the Property after the Effective Date.

"Fund" means the Hazardous Substance Superfund established under section 9507 of the Internal Revenue Code, 26 U.S.C. § 9507.

"Future Response Costs" means all costs (including direct, indirect, payroll, contractor, travel, and laboratory costs) that the United States or the State incurs or pays in supporting, developing, implementing, overseeing, or enforcing this Settlement, including: (a) in developing, reviewing and approving deliverables generated under this Settlement; (b) in overseeing Purchaser's performance of the Work; (d) in taking a response action under ¶ 38 (Emergency Response); (e) in implementing a Work Takeover under ¶ 44 ; (f) in securing, implementing, monitoring, maintaining, or enforcing the requirements of Section VIII (Property Requirements); (g) in taking action under ¶ 61 (Access to Financial Assurance); and (h) in enforcing this Settlement, including all costs paid under Section XIII (Dispute Resolution) and all litigation costs. Future Response Costs also includes all Interest accrued on EPA's unreimbursed costs.

"HSMA" means the Utah Hazardous Substances Mitigation Act, Utah Code §§ 19-6-301 to 326.

"Including" or "includes" means "including but not limited to."

"Interest" means interest at the rate specified for interest on investments of the Fund, as provided under section 107(a) of CERCLA, compounded annually on October 1 of each year. The applicable rate of interest is the rate in effect at the time the interest accrues as of the Effective Date. The rate of interest is subject to change on October 1 of each year. Rates are available online at https://www.epa.gov/superfund/superfund-interest-rates.

"National Contingency Plan" or "NCP" means the National Oil and Hazardous Substances Pollution Contingency Plan promulgated under section 105 of CERCLA, codified at 40 C.F.R. part 300, and any amendments thereto.

"Operable unit 1" or "OU1" means the tailings impoundment covering approximately 160 acres of land within portions of Summit County Assessor parcels SS-87 and SS-88, immediately southeast of the junction of U.S. Highway 40 and Utah Highway 248 in Summit County, Utah.

"Operable unit 2" or "OU2" means Lower Silver Creek, an area bounded by Highway 40 on its southern end and Interstate 80 on its northern end, ranging in width from 2,100 feet at the southern boundary to 3,800 feet near Pivotal Promontory Road, in Township 1 South Range 4 East, in Sections 10, 11, 14, 15, 22, 23, 26, 27, and 35 and approximately 500 feet in Section 2 of Township 2 South Range 4 East, Summit County, Utah.

"Operable unit 3" or "OU3" means all or a portion of Summit County Assessor parcel numbers SS-28-A-1-X, SS-27-B-X, SS-28-A-X, SS-56, SS-56-A-1, SS-56-UP-X, SS-56-A, SS-64-A, SS-64-1000-UP-X, SS-65-A-3-1, SS-65-A-5, SS-65-A-3, SS-65-1, SS-65-A-6, and SS-88.

"Operable unit 4" or "OU4" means the discharge from the Prospector Drain.

"Operations and Maintenance" or "O & M" means all actions necessary to ensure the effectiveness and integrity of the Response Action to be performed under this Settlement and any other response action implemented under the Record of Decision, including implementation of institutional controls for OU1 such as groundwater and land use restrictions in accordance with the Record of Decision.

"Paragraph" or "¶" means a portion of this Settlement identified by an Arabic numeral or an upper- or lower-case letter.

"Parties" means the United States, State, and Purchaser, collectively.

"Party" means the United States, State, or Purchaser individually.

"Property" means that certain real property conveyed by the Sheriff's Deed, defined using the legal descriptions in Appendix A. The Property includes areas within OU1, a small portion of OU3 and those areas of parcels SS-87 and SS-88 (referred to in Appendix A as Parcels P-1 and P-2) that are outside of the Site but are impacted by historic mine waste identified in the Work Plan. A map of the Property and its relation to the Site is generally depicted in Appendix A.

"Purchaser" means LHM DEV RIH LLC, a Utah limited liability company.

"RCRA" means the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992 (also known as the Resource Conservation and Recovery Act).

"Record of Decision" or "ROD" means the EPA Record of Decision relating to OU1 of the Site signed on July 6, 2005, by the Assistant Regional Administrator, Office of Ecosystems Protection and Remediation, EPA Region 8, and all attachments thereto.

"Response Action" means the response action required under this Settlement.

"Response Action Work Plan" means the work plan for the Response Action as described further in Section VII

"Section" means a portion of this Settlement identified by a Roman numeral.

"Settlement" means this Administrative Settlement Agreement for Removal Action by Bona Fide Prospective Purchaser, all appendixes attached hereto (listed in Section XXI

Appendixes). If there is a conflict between a provision in Sections I through XXVIII and a provision in any of the Appendixes, the provision in Sections I through XXVIII controls.

"Sheriff's Deed" means that certain Sheriff's Deed, dated February 10, 2022, and recorded with the Summit County Recorder as Entry No. 01183181 that was issued to Purchaser for Summit County parcels SS-87 and SS-88 (referred to in Appendix A as OU-1 and Portion of OU-3 and Parcels P-1, P-2, P-3, and P-4).

"Site" means the Richardson Flat Tailings Superfund Site, located in and around Park City, in Summit County, Utah as depicted in the map attached as Appendix B.

"State" means the State of Utah and each department, agency, and instrumentality of the State, including DEQ.

"Transfer" means to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"Transferee" means the party to whom a Transfer is made.

"United States" means the United States of America and each department, agency, and instrumentality of the United States, including EPA.

"Waste Material" means (a) any "hazardous substance" under section 101(14) of CERCLA; (b) any pollutant or contaminant under section 101(33) of CERCLA; (c) any "solid waste" under section 1004(27) of RCRA; and (d) any "hazardous material" under Utah law.

"Work" means all obligations of Purchaser under Sections VII (Response Action to be Performed) through X (Indemnification and Insurance).

"Work Takeover" means EPA's assumption of the performance of any of the Work in accordance with ¶ 44.

IV. STATEMENT OF FACTS

8. Mining operations in the Park City Mining District began around 1869. Numerous mines and mills operated in Empire and Ontario Canyons just south of Park City, and along Silver Creek, which flows from these canyons through Park City into the floodplains northeast of the city. Approximately 16 million tons of ore were produced between 1875 and 1982. As many as ten mills operated along the banks of Silver Creek at various times. Mine waste and tailings from these operations were discharged into Silver Creek and were transported downstream to Lower Silver Creek.

9. As a result of contamination from these operations, EPA proposed to include the Site on the National Priorities List ("NPL") on June 24, 1988. Due to scoring issues and comments received during the public comment period, the Site was removed from NPL

consideration in February 1991. The Site was re-proposed for the NPL on February 7, 1992. No action has been taken with regard to finalizing this proposed listing.

10. Initially, the Site encompassed the 160-acre tailings impoundment approximately three and one-half miles northeast of Park City, adjacent to Silver Creek. Tailings were deposited in the impoundment beginning in the early days of mining in Park City through the 1980s. It is estimated between two and seven million tons of mine tailings were deposited in the impoundment. EPA designated the Richardson Flat tailings impoundment as OU1 of the Site. OU1 is situated within portions of Summit County parcels SS-87 and SS-88.

11. In 2005, EPA issued a ROD for OU1 that called for consolidating lead and arsenic laden mine waste within the tailings impoundment and capping the contaminated material with 18 inches of clean material.

12. Exposure to elevated levels of lead and arsenic can negatively impact human health in a variety of ways, including damage to blood cells and the gastrointestinal, kidney, reproductive, and nervous systems.

13. In 2007, EPA and United Park City Mines ("UPCM") entered a consent decree, captioned 2:07-cv-00642-BSJ in the U.S. District Court for the District of Utah, under which UPCM implemented the majority of work required by the ROD. The OU1 tailings impoundment has been capped, but a portion of the OU1 impoundment has less than the required 18-inch cap.

14. EPA expanded the Site to include additional areas of contamination associated with historic mining operations in the Upper Silver Creek watershed. Extensive mining operations were conducted in Empire and Ontario Canyons and wastes generated by these operations were deposited into creeks, which transported materials downstream to Lower Silver Creek. EPA designated OU2 of the Site to address mine waste and tailings that had been transported downstream of OU1 over approximately four miles along the banks of Lower Silver Creek, from State Route 248 on the southern end to Interstate 80 on the northern end. OU2 originally encompassed approximately 1,875 acres.

15. Thereafter, EPA divided OU2 and created a new OU3, which reorganized Lower Silver Creek into two operable units and added a portion known as the "Middle Reach" along Silver Creek below Park City. A portion of the Middle Reach, known as the Silver Maple Claims, is under the jurisdiction of the Bureau of Land Management. OU2 encompasses approximately 1,216 acres and OU3 encompasses approximately 856 acres. A small portion of OU3 is situated within parcel SS-88 of the Property.

16. In 2014, EPA, DEQ, UPCM and others entered an administrative order on consent for engineering evaluation/cost analysis ("EE/CA") and removal action at OU2 and OU3, captioned CERCLA-08-2014-0003. UPCM failed to complete the work and in 2017, EPA took over the work and is now completing the EE/CA and removal action.

17. EPA also created OU4, which consists of the discharge from the Prospector Drain, an underground pipe that runs through a subdivision of Park City known as Prospector

Square. In the late 1800s and early 1900s, approximately 150 acres of land in this area were used to dispose of mill tailings.

18. In 2013, EPA, Park City Municipal Corporation and others entered an administrative order on consent for EE/CA and removal action at OU4, captioned CERCLA-08-2013-0001. Work under the 2013 OU4 administrative order on consent is ongoing.

19. In 2015, Wells Fargo initiated an over $150 million foreclosure action against UPCM and other related entities. In the foreclosure proceedings, a judgment lien was filed against all parcels owned by UPCM, including parcels SS-87 and SS-88 that encompassed the Property.

20. Before being issued the Sheriff's Deed in February 2022, Purchaser had a Phase 1 Environmental Site Assessment, dated October 1, 2021, performed on Summit County parcels SS-87 and SS-88 and an Environmental Management Plan, dated November 17, 2021, prepared for the Property.

21. On October 17, 2022, Judge Bruce Jenkins, of the United States District Court for the District of Utah, entered a Consent Decree in Case No. 2.19-cv-00200-BSJ between the United States and UPCM relating to the Site and other areas. This Consent Decree supersedes all prior consent decrees entered between the United States and UPCM relating to the Site. The Consent Decree released UPCM from all liability associated with the Site and other areas and required UPCM to pay approximately $7 million to the United States for future response costs.

22. EPA plans to issue an action memorandum for a removal action pertaining to the hazardous substances at OU2 and OU3 (the "Action Memorandum").

V. DETERMINATIONS

23. Based on the Statement of Facts set forth above, and the administrative record, EPA has determined that:

a. The Site is a "facility" and that portion of the Property within the Site is a "facility" as defined by section 101(9) of CERCLA.

b. The contamination found at the Site and the Property, as identified in the Statement of Facts above, includes "hazardous substance(s)" as defined by section 101(14) of CERCLA.

c. Purchaser is a "person" as defined by section 101(21) of CERCLA.

d. The conditions described in the Statement of Facts above constitute an actual or threatened "release" of a hazardous substance from the Site and the Property as defined by section 101(22) of CERCLA.

e. The Response Action required by this Settlement is necessary to protect the public health or welfare or the environment.

VI. COORDINATION AND SUPERVISION

24. **Purchaser's Project Coordinator**

a. Purchaser's Project Coordinator will be responsible for administration of the Work required by this Settlement. Purchaser's Project Coordinator shall have sufficient technical expertise to coordinate the Work. To the greatest extent possible, the Project Coordinator shall be present at the Property or readily available during the Work.

b. Notice or communication relating to this Settlement from EPA to Purchaser's Project Coordinator constitutes notice or communication to Purchaser.

25. **Procedures for Notice and Disapproval**

a. Within 30 days after the Effective Date, Purchaser shall designate a Project Coordinator and shall notify EPA and DEQ of the name, title, contact information, and qualifications of the proposed Project Coordinator, whose qualifications shall be subject to EPA's review for verification based on objective assessment criteria (*e.g.*, experience, capacity, technical expertise) and who shall not have a conflict of interest with respect to the Work. Purchaser shall notify EPA and DEQ of the names, titles, contact information, and qualifications of any contractors or subcontractors retained to perform the Work at least 30 days prior to commencement of such Work.

b. EPA, after consultation with DEQ, may issue notices of disapproval regarding any proposed Project Coordinator, contractor, or subcontractor, as applicable. If EPA issues a notice of disapproval, Purchaser shall, within 14 days, submit to EPA and DEQ a list of supplemental proposed Project Coordinators, contractors, or subcontractors, as applicable, including a description of the qualifications of each.

c. EPA, after consultation with DEQ, may disapprove the proposed Project Coordinator, contractor, or subcontractor, based on objective assessment criteria (e.g., experience, capacity, technical expertise), if they have a conflict of interest regarding the project, or any combination of these factors.

d. Purchaser may change its Project Coordinator by following the procedures under ¶¶ 25.a and 25.b.

e. Notwithstanding the procedures of ¶¶ 24.a through 24.c, Purchaser has proposed, and EPA has authorized Purchaser to proceed, regarding the following Project Coordinator, and Supervising Contractor: David S. Wilson, P.E., P.G., Senior Principal Engineer, Tetra Tech, Environmental Commercial Accounts, 4750 West 2100 South, Suite 400, Salt Lake City, Utah 84120, 801-916-6957, davidwilson.wilson@tetratech.com.

26. **EPA RPM.** EPA designates James Hou of the Superfund and Emergency Management Division, Region 8, as its Remedial Project Manager ("RPM"). The RPM has the authorities described in the NCP, including oversight of Purchaser's implementation of the

Work, authority to halt, conduct, or direct any Work, or to direct any other removal action undertaken at the Property. The RPM's absence from the Site is not a cause for stoppage of work unless specifically directed by the RPM. EPA may change its RPM and will notify Purchaser of any such change.

27. **State Project Manager.** The State designates Maureen Petit of DEQ as its State Project Manager ("SPM"). The State may change its SPM and will notify Purchaser of any change.

VII. RESPONSE ACTION TO BE PERFORMED

28. Purchaser shall perform all actions necessary to implement, maintain, and monitor the effectiveness of the Response Action in accordance with this Settlement, and all EPA-approved, conditionally approved, or modified deliverables as required by this Settlement. The Response Action is limited to the Work in accordance with the Response Action Work Plan.

29. For any regulation or guidance referenced in the Settlement, the reference will be read to include any subsequent modification, amendment, or replacement of a regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Purchaser receives notification from EPA of the modification, amendment, or replacement.

30. **Response Action Work Plan**. The Response Action Work Plan attached hereto as Appendix C is approved and agreed to by the Parties contemporaneously with and is effective as of the Effective Date of this Settlement.

31. **Action Memorandum**. EPA shall promptly notify Purchaser of the issued Action Memorandum in accordance with ¶ 102. If the Action Memorandum does not include EPA bringing hazardous substances from OU2 and OU3 to OU1, Purchaser will submit to EPA and the State an amended schedule to implement the Response Action Work Plan within 60 days of EPA issuing the Action Memorandum. Purchaser's amended schedule will be subject to State and EPA review, and EPA approval, prior to Purchaser implementing the Response Action Work Plan.

32. **Health and Safety Plan.** Within 30 days after the Effective Date, Purchaser shall submit to EPA for review and comment Health and Safety Plan ("HASP") that meets the requirements of 29 C.F.R. § 910.120 for developing the HASP and that describes all activities to be performed to protect on site personnel and area residents from physical, chemical, biological, and all other hazards related to the performance of Work at the Property under this Settlement. Purchaser shall develop the HASP in accordance with *EPA's Emergency Responder Health and Safety Manual*, OSWER Directive 9285.3-12 (July 2005 and updates), available at https://response.epa.gov/site/site_profile.aspx?site_id=2810. In addition, Purchaser shall ensure that the HASP complies 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 HASP shall also include contingency planning. Purchaser shall incorporate all changes to the HASP recommended by EPA and shall implement the plan during the pendency

of the Work. Purchaser shall update the plan as necessary or appropriate during the course of the Work, and/or as requested by EPA.

33. **Quality Assurance, Sampling, and Data Analysis**

a. Purchaser shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with EPA's *Environmental Information Quality Policy*, CIO 2105.1 (Mar. 31, 2021), available at https://ww.epa.gov/irmpoli8/environmental-information-quality-policy, the most recent version of *Quality Management Systems for Environmental Information and Technology Programs – Requirements with Guidance for Use*, ASQ/ANSI E4:2014 (Feb. 2014), and *EPA Requirements for Quality Assurance Project Plans*, EPA QA/G-5 (EPA/240/B-01/02) (Mar. 2001), available at https://www.epa.gov/quality/epa-qar-5-epa-requirements-quality-assurance-project-plans.

b. Purchaser shall ensure that EPA and DEQ personnel and their authorized representatives are allowed reasonable access to laboratories used by Purchaser in implementing this Settlement. In addition, Purchaser shall ensure that these laboratories analyze all samples submitted by EPA or DEQ under the Quality Assurance Project Plan ("QAPP") for quality assurance monitoring. Purchaser shall ensure that its sampling and field activities shall be conducted in accordance with the *EPA QA Field Activities Procedure*, CIO 2105-P-02.0 (Sept. 24, 2014) available at https://www.epa.gov/irmpoli8/epa-qa-field-activities-procedures. Purchaser shall ensure that the laboratories it uses for the analysis of samples taken under this Settlement meet the competency requirements set forth in the *Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions* available at https://www.epa.gov/measurements/documents-about-measurement-competency-under-acquisition-agreements and that the laboratories perform all analyses according to EPA-accepted methods. Accepted EPA methods are documented on the EPA's "Superfund Contract Laboratory Program" website at https://www.epa.gov/clp, the "Hazardous Waste Test Methods/SW 846" website (*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*) at https://www.epa.gov/hw-sw846, the "Standard Methods for the Examination of Water and Wastewater" website at https://www.standardmethods.org/, and the "Air Toxics – Monitoring Methods" (40 C.F.R. Part 136) website at https://www3.epa.gov/ttnamti1/airtox.html.

c. Upon request, Purchaser shall provide split or duplicate samples to EPA, DEQ, or their authorized representatives. Purchaser shall notify EPA and DEQ not less than 7 days prior to any sample collection activity unless shorter notice is agreed to by EPA, after consultation with DEQ. In addition, EPA has the right to take any additional samples that EPA deems necessary. Upon request, EPA shall provide to Purchaser split and/or duplicate samples of any samples in connection with EPA's oversight sampling.

d. Purchaser shall submit to EPA and DEQ all sampling and tests results and other data obtained or generated by or on behalf of Purchaser or in connection with the implementation of this Settlement.

e. **Community Involvement.** EPA has the lead responsibility for implementing community involvement activities at the Site, including the preparation of a community involvement plan, in accordance with the NCP and EPA guidance. As directed by EPA, Purchaser shall participate in community involvement activities, including participation in (a) the preparation of information regarding the Work for dissemination to the public (including compliance schedules and progress reports), with consideration given to the specific needs of the community, including translated materials and mass media and/or Internet notification, and (b) public meetings that may be held or sponsored by EPA to explain activities at or relating to the Property.

34. **Deliverables: Specifications and Approval**

a. **General Requirements for Deliverables.** Purchaser shall submit all deliverables to EPA and DEQ in electronic form, unless otherwise specified by the RPM.

b. **Technical Specifications for Deliverables.** Sampling and monitoring data should be submitted in standard regional Electronic Data Deliverable ("EDD") format, such as Excel spreadsheets. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

35. **Approval of Deliverables.** For each deliverable required to be submitted by Purchaser for EPA approval under this Settlement, EPA, after reasonable opportunity for review and comment from DEQ, shall: (a) approve, in whole or in part, the deliverable; (b) approve the submission upon specified conditions and/or require revisions to the deliverable; (c) disapprove, in whole or in part, the deliverable and require revisions to the deliverable; or (d) any combination of the foregoing. If EPA requires revisions, EPA will provide a deadline for the resubmission, and Purchaser shall submit the revised deliverable by the required deadline. Once approved or approved with conditions, Purchaser shall implement each deliverable in accordance with the EPA-approved schedule. Upon approval, or subsequent modification, by EPA of any deliverable, or any portion thereof: (1) such deliverable, or portion thereof, and any subsequent modifications, will be incorporated into and enforceable under this Settlement; and (2) Purchaser shall take any action required by a deliverable, or portion thereof. Purchaser shall not commence or perform any Work except in conformance with the terms of this Settlement.

36. **Off-Site Shipments**

a. Purchaser may ship hazardous substances, pollutants and contaminants from the Property to an off-Site facility only if Purchaser complies with section 121(d)(3) of CERCLA and 40 C.F.R. § 300.440. Purchaser will be deemed to be in compliance with CERCLA § 121(d)(3) and 40 C.F.R. § 300.440 regarding a shipment if Purchaser obtains a prior determination from EPA that the proposed receiving facility for a shipment is acceptable under the criteria of 40 C.F.R. § 300.440(b).

b. Purchaser may ship Waste Material from the Property to an out-of-state waste management facility only if, prior to any shipment, it provides written notice to the appropriate state environmental official in the receiving facility's state and to the RPM. This

written notice requirement will not apply to any off-Site shipments when the total quantity of all shipments does not exceed ten cubic yards. The written notice shall include the following information, if available: (1) the name and location of the receiving facility; (2) the type and quantity of Waste Material to be shipped; (3) the schedule for the shipment; and (4) the method of transportation. Purchaser also shall notify the state environmental official referenced above and the RPM of any major changes in the shipment plan, such as a decision to ship the Waste Material to a different out-of-state facility. Purchaser shall provide the written notice after the award of the contract for the Response Action and before the Waste Material is shipped.

c. Purchaser may ship Investigation Derived Waste ("IDW") from the Property to an off-Site facility only if it complies with section 121(d)(3) of CERCLA, 40 C.F.R. § 300.440, EPA's *Guide to Management of Investigation Derived Waste*, OSWER 9345.3-03FS (January 1992) available at https://semspub.epa.gov/work/03/136166.pdf, and any IDW-specific requirements contained in the ROD. Wastes shipped off-Site to a laboratory for characterization, and RCRA hazardous wastes that meet the requirements for an exemption from RCRA under 40 C.F.R. § 261.4(e) shipped off-Site for treatability studies, are not subject to 40 C.F.R. § 300.440.

37. **Permits**

a. As provided in CERCLA § 121(e), and section 300.400(e) of the NCP, no permit is required for any portion of the Work conducted entirely on-site (*i.e.*, within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work). Where any portion of the Work that is not within the Property requires a federal or state permit or approval, Purchaser shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals.

b. Purchaser may seek relief under the provisions of Section XII (Force Majeure) for any delay in the performance of the Work resulting from a failure to obtain, or a delay in obtaining, any permit or approval referenced in ¶ 37.a required for the Work, provided that it has submitted timely and complete applications and taken all other actions necessary to obtain all such permits or approvals.

c. Nothing in this Settlement constitutes a permit issued under any federal or state statute or regulation.

38. **Emergency Response.** If any event occurs during performance of the Work that causes or threatens to cause a release of Waste Material on, at, or from the Property that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Purchaser shall: (a) immediately take all appropriate action to prevent, abate, or minimize a release or threat of release; (b) immediately notify the RPM and the SPM or, in the event of the RPM's unavailability, the Regional Duty Officer at 303-293-1788 of the incident or Property conditions; and (c) take these actions in consultation with the RPM or authorized EPA officer and in accordance with all applicable provisions of this Settlement, including the Health and Safety Plan, and any other applicable deliverable approved by EPA. In

the event that Purchaser fails to take appropriate response action as required by this Paragraph, and EPA or DEQ takes an action instead, Purchaser must reimburse EPA under Section XI (Payment for Response Costs) for all costs of the response action not inconsistent with the NCP.

39. **Release Reporting.** Upon the occurrence of any event during performance of the Work that Purchaser is required to report under CERCLA § 103 or section 304 of the Emergency Planning and Community Right-to-know Act ("EPCRA"), 42 U.S.C. § 11004, Purchaser shall immediately orally notify the RPM or, in the event of their unavailability, the Regional Duty Officer at 303-293-1788, and the National Response Center at (800) 424-8802. Purchaser shall also submit a written report to EPA within seven days after the onset of an event (a) describing the event and (b) all measures taken and to be taken: (i) to mitigate any release or threat of release, (ii) to mitigate any endangerment caused or threatened by the release; (iii) to prevent the reoccurrence of any release or threat of release. This Paragraph does not affect Purchaser's obligation to otherwise comply with section 103 of CERCLA and section 304 of EPCRA.

40. **Progress Reports.** Commencing upon EPA's approval of the Response Action Work Plan and until issuance of a notice of completion of work under ¶ 42, Purchaser shall submit monthly written progress reports to EPA and DEQ, or as otherwise directed in writing by the RPM. 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.

41. **Final Report.** Within 90 days after completion of all Work required by this Settlement, other than continuing obligations listed in ¶ 42, Purchaser shall submit for EPA review and approval, after consultation with DEQ, a final report regarding the Work.

a. The final report shall:

(1) summarize the actions taken to comply with this Settlement;

(2) conform to the requirements of section 300.165 of the NCP ("OSC Reports");

(3) list the quantities and types of materials removed off-Site, off-Property by Purchaser or managed by Purchaser within OU1;

(4) describe the removal and disposal options considered for those materials;

(5) identify the ultimate destination(s) of those materials;

(6) include the analytical results of all sampling and analyses performed; and

(7) include all relevant documentation generated during the Work (e.g., manifests, invoices, bills, contracts, and permits) and an estimate of the total costs incurred to complete the Work.

b. The final report shall also include the following certification signed by a responsible corporate official of Purchaser or Purchaser's Project Coordinator: "I certify under penalty of perjury that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than 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."

42. **Notice of Completion of Work**

a. If after reviewing the final report under ¶ 41, EPA, after consultation with DEQ, determines that all Work, other than the continuing obligations, has been fully performed in accordance with this Settlement, EPA will provide written notice to Purchaser. A notice of completion of work does not affect the following continuing obligations:

(1) activities under Section VII (Response Action);

(2) obligations under Section VIII (Property Requirements);

(3) payment of Future Response Costs; and

(4) obligations under Section XIX (Records).

b. If EPA, after consultation with DEQ, determines that any Work other than the continuing obligations has not been completed in accordance with this Settlement, EPA will notify Purchaser and provide a list of the deficiencies. Purchaser shall promptly correct all deficiencies. Purchaser shall submit a modified Final Report upon completion of the deficiencies.

43. **Compliance with Applicable Law.** Nothing in this Settlement affects Purchaser's obligations to comply with all applicable state and federal laws and regulations, except as provided in section 121(e) of CERCLA and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all actions undertaken within the Property required under this Settlement shall, to the extent practicable, as determined by EPA, after consultation with DEQ, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements ("ARARs") under federal environmental or state environmental or facility siting laws. EPA deems the activities conducted in accordance with this Settlement, if approved by EPA, to be consistent with the NCP as provided under section 300.700(c)(3).

44. **Work Takeover**

a. If EPA determines that Purchaser: (i) has ceased to implement any of the Work required under Section VII (Response Action to be Performed), (ii) is seriously or repeatedly deficient or late in its performance of the Work required under Section VII (Response Action to be Performed), or (iii) is performing the Work required under Section VII (Response Action to be Performed) in a manner that may cause an endangerment to public health or welfare or the environment, EPA may issue a notice of Work Takeover to Purchaser, including a description of the grounds for the notice and a period of time ("Remedy Period") within which Purchaser shall remedy the circumstances giving rise to the notice. The Remedy Period will be 20 days, unless EPA determines in its unreviewable discretion that there may be an endangerment, in which case the Remedy Period will be 10 days.

b. If, by the end of the Remedy Period, Purchaser does not remedy to EPA's satisfaction the circumstances giving rise to Work Takeover Notice, EPA may notify Purchaser and, as it deems necessary, commence a Work Takeover.

c. EPA may conduct the Work Takeover during the pendency of any dispute under Section XIII but shall terminate the Work Takeover if and when: (i) Purchaser remedies, to EPA's satisfaction, the circumstances giving rise to the notice of Work Takeover; or (ii) upon the issuance of a final determination under Section XIII (Dispute Resolution) that EPA is required to terminate the Work Takeover.

VIII. PROPERTY REQUIREMENTS

45. **Notices.** Purchaser shall provide all legally required notices with respect to the discovery or release of any hazardous substance at the Property that occurs after the Effective Date.

46. **Non-Interference and Access.** Purchaser shall refrain from using the Property in any manner that EPA, in consultation with DEQ, determines will pose an unacceptable risk to public health or welfare or the environment due to exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the response actions being undertaken by EPA, its contractors or other parties. Purchaser shall provide full cooperation, assistance, and access to persons that are authorized to conduct response actions or natural resource restoration at the Property (including the cooperation and access necessary for the installation, integrity, operation, and maintenance of any complete or partial response actions or natural resource restoration at the Property). Commencing on the Effective Date, Purchaser shall provide EPA, the State, and their representatives, including contractors, and subcontractors, access to the Property at all reasonable times to conduct any activity regarding the Settlement at the Property, including the following:

a. implementing the Work and overseeing compliance with the Settlement;

b. conducting investigations of contamination at or near the Property;

c. assessing the need for, planning, implementing, or monitoring additional response actions at or near the Property;

d. implementing a response action by persons performing under EPA oversight;

e. determining whether the Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under this Settlement or an EPA decision document for the Site; and

f. implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and any institutional controls.

47. **Appropriate Care.** Commencing on the Effective Date, Purchaser shall exercise appropriate care with respect to hazardous substances found at the Property by taking reasonable steps to stop any continuing release; prevent any threatened future release; and prevent or limit human, environmental or natural resource exposure to any previously released hazardous substance.

48. **Land, Water, or Other Resource Use Restrictions.** Purchaser shall: (1) remain in compliance with any land use restrictions established in connection with any response action at the Property; (2) conduct operations and maintenance in accordance with the ROD, including implementing, maintaining, monitoring, and reporting on institutional controls at the Property; and (3) not impede the effectiveness or integrity of any institutional control employed at the Property in connection with a response action.

49. **Notice to Successors-in-Title**

a. Purchaser shall, prior to entering into a contract to Transfer any of the Property, or 60 days prior to transferring any of the Property, whichever is earlier:

(1) notify the proposed Transferee that EPA has selected certain response actions regarding the Site, that Purchaser has entered into this Settlement requiring implementation of the Response Action and compliance with the requirements at the Property in this Section VIII (identifying the name, CERCLA docket number, and the Effective Date of this Settlement); and

(2) notify EPA and DEQ of the name and address of the proposed Transferee and provide EPA and DEQ with a copy of the above notice that it provided to the proposed Transferee, and notify EPA if Purchaser seeks termination of its obligations in accordance with ¶ 51.

50. For so long as Purchaser is an owner or operator of any of the Property, Purchaser shall require that Transferees and other parties with rights to use any of the Property provide access and cooperation to EPA, the State, their authorized officers, employees, representatives, and all other persons performing response actions under EPA oversight. Purchaser shall require

that Transferees and other parties with rights to use any of the Property implement and comply with any land use restrictions and institutional controls on the Property in connection with any response action, and not contest EPA's and DEQ's authority to enforce any land use restrictions and institutional controls on any of the Property.

51. Upon sale or other conveyance of any of the Property, Purchaser shall require that each Transferee or other holder of an interest in any of the Property shall agree to comply with Section XIX (Records) and this Section VIII (Property Requirements) and not contest EPA's and DEQ's authority to enforce any land use restrictions and institutional controls on any of the Property. After EPA's issuance of a notice of completion of work under ¶ 42 and Purchaser's written demonstration to EPA that a Transferee or other holder of an interest in any of the Property agrees to comply with the requirements of this ¶ 51, EPA will notify Purchaser that its obligations under this Settlement, except obligations under Section XIX (Records), are terminated with respect to any of the Property.

52. Purchaser shall provide a copy of this Settlement to any current lessee, sublessee, and other party with rights to use any of the Property as of the Effective Date.

53. **Obligations Upon Title Transfer**

a. Transfer of any of the Property does not alter any of Purchaser's obligations under this Settlement, except as provided in this ¶ 53.

b. Upon the sale or other conveyance of title of any of the Property, Purchaser shall: (1) continue to comply with the obligations under this Settlement; and (2) require each Transferee to certify in writing to EPA, DEQ, and Purchaser (in a form substantially similar to EPA's Sample Transferee's Certification, Appendix D) that: (i) it will comply with this Section and Section XIX (Records); and (ii) EPA and DEQ have the authority to enforce this Section and Section XIX against Transferee.

c. **Modifying Purchaser's Obligations.** Upon the sale or other conveyance of title of any of the Property, if Purchaser seeks to terminate or assign any of its obligations under this Settlement to any third party, including a governmental or quasi-governmental agency, it must obtain the written consent of the United States or EPA and DEQ, consistent with ¶ 53.d. The United States or EPA, and DEQ, not more than sixty (60) days after written request for their consent, in their unreviewable discretion, may provide such consent after considering factors including the following:

(1) The scope of remaining Work under this Settlement.

(2) Purchaser's commitment from a Transferee to implement the remaining Work.

(3) Transferee's technical and financial capability to conduct the Work properly and promptly in accordance with this Settlement.

(4) Whether EPA and DEQ should "look first" to Transferee without terminating Purchaser's obligations under this Settlement as described in ¶ 53.e.

d. **Documenting Transferee's Obligations.** If the United States or EPA, and DEQ, provide such consent under ¶ 53.c, and

(1) if EPA and DEQ determine the obligations being assigned to Transferee are insufficient for the United States and the State to provide a covenant not to sue to Transferee, EPA and DEQ may require, as a condition of EPA's and DEQ's consent, Transferee's written certification (in a form substantially similar to Appendix D) agreeing: (1) to comply with this Section and Section XIX (Records); and (2) that EPA and DEQ have the authority to enforce this Section and Section XIX against Transferee. Purchaser may be relieved of these obligations only after Transferee provides such written certification and EPA and DEQ provide written consent by countersigning the certification; or

(2) if the United States and DEQ determine the obligations being assigned to Transferee are sufficient for the United States and the State to provide a covenant not to sue to Transferee, the United States and DEQ may require, as a condition of the United States' and the DEQ's consent, a modification to this Settlement executed in accordance with Section XXII, binding Transferee to the obligations of this Settlement, including the Work requirements, the financial assurance requirements in Section IX, and the certification in Section XV. Purchaser may be relieved of these obligations and the covenants in Section XVI will be effective as to Transferee only after the Parties and Transferee enter such a modification.

e. **Documenting Transferee's and Purchaser's Obligations Under a "Look First" Provision.** "Look first" for the purposes of this Settlement means EPA would agree, where appropriate, to seek performance of the obligations required under this Settlement first from the Transferee before pursuing the Purchaser for such actions. If EPA determines a "look first" provision is a requirement of modifying the Purchaser's obligations as set forth in ¶ 53.c(4), then the modification required by ¶ 53.d(2) must include the following language: Upon the effective date of this modification, Transferee agrees to be the party primarily responsible for the performance of the Work required under this Settlement. EPA and DEQ will initially seek performance, and stipulated penalties for noncompliance with this Settlement only, from the Transferee unless: (1) EPA issues a notice of noncompliance to Transferee and Transferee has not come into compliance within 60 days; (2) Transferee is not technically or financially capable of conducting the Work properly and promptly; or (3) any obligations imposed by this Settlement become unenforceable against Transferee, including by reason of Transferee's bankruptcy, insolvency, winding up, or other dissolution. If any of the conditions described in the preceding sentence occur, EPA may send a notice to Purchaser to resume performance of the Work. Purchaser shall comply with the notice within 30 days. If Purchaser fails to resume

performance of the Work, Purchaser is liable for stipulated penalties for Purchaser's noncompliance with this Settlement.

f. Obligations under Section XIX (Records) are not affected by any certification or modification, unless explicitly provided for by the United States and DEQ.

g. If Purchaser sells or otherwise conveys title to any portion of the Property outside of Operable Unit 1 or Operable Unit 3 of the Site, notwithstanding Paragraph 53(a)-(f), the Parties' obligations with respect to those portions of the Property shall terminate upon the sale or other conveyance of title to the Property, and the Transferee may avail itself of the CERCLA Bona Fide Prospective Purchaser provisions, 42 U.S.C. §§ 9601(40), 9607(r)(1), if applicable, regarding any ongoing obligations it may have regarding those portions of the Property.

54. Notwithstanding any provision of this Settlement, EPA and the State retain all of their access authorities and rights, as well as all of their rights to require land, water or other resource use restrictions and institutional controls, including related enforcement authorities, under CERCLA, RCRA, and any other applicable statute or regulations.

IX. FINANCIAL ASSURANCE

55. To ensure completion of the Work required under Section VII (Response Action to be Performed), Purchaser shall secure financial assurance, initially in the amount of $1 million ("Estimated Cost of the Work"). The financial assurance must: (i) be one or more of the mechanisms listed below, in a form substantially identical to the relevant sample documents available from EPA; and (ii) be satisfactory to EPA. As of the Effective Date, the sample documents can be found under the "Financial Assurance - Orders" category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/. Purchaser may use multiple mechanisms if they are limited to surety bonds guaranteeing payment, letters of credit, trust funds, or some combination thereof. The following are acceptable mechanisms:

a. a surety bond guaranteeing payment, performance of the Work, or both, in accordance with Paragraph 61 (Access to Financial Assurance), that is issued by a surety company among those listed as acceptable sureties on federal bonds as set forth in Circular 570 of the U.S. Department of the Treasury;

b. an irrevocable letter of credit guaranteeing payment in accordance with Paragraph 61 (Access to Financial Assurance) that is issued by an entity that has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a federal or state agency;

c. a trust fund (1) established to ensure that funds will be available as and when needed for performance of the Work; (2) administered by a trustee that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency; and (3) governed by an agreement that requires the trustee to make payments from the fund only when the Superfund Division Director advises the trustee in writing that: (i) payments

are necessary to fulfill the affected Owner's obligations under the Settlement; or (ii) funds held in trust are in excess of the funds that are necessary to complete the performance of Work in accordance with this Settlement;

d. a demonstration by Purchaser that it meets the relevant test criteria of ¶ 57; or

e. a guarantee to fund or perform the Work executed by a company: (1) that is a direct or indirect parent company of Purchaser or has a "substantial business relationship" (as defined in 40 C.F.R. § 264.141(h)) with Purchaser; and (2) demonstrates to EPA's satisfaction that it meets the financial test criteria of ¶ 57.

56. **Standby Trust.** If Purchaser seeks to establish financial assurance by using a surety bond, a letter of credit, or a corporate guarantee, Purchaser shall at the same time establish and thereafter maintain a standby trust fund, which must meet the requirements specified in Paragraph 55.c, and into which payments from the other financial assurance mechanism can be deposited if EPA so requires in accordance with the terms and conditions of the financial assurance mechanism and Paragraph 61 (Access to Financial Assurance). An originally signed duplicate of the standby trust agreement must be submitted, with the other financial mechanism, to EPA in accordance with Paragraph 59. Until the standby trust fund is funded pursuant to Paragraph 61 (Access to Financial Assurance), neither payments into the standby trust fund nor annual valuations are required.

57. If Purchaser seeks to provide financial assurance by means of a demonstration or guarantee under ¶ 55.d or 55.e, not more than 30 days after EPA provides Purchaser with EPA's Action Memorandum for EPA's work related to placing OU2 and OU3 Waste Material onto OU1, Purchaser shall:

a. demonstrate that:

(1) the Purchaser or guarantor has:

i. two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and

ii. net working capital and tangible net worth each at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. tangible net worth of at least $10 million; and

iv. assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; or

(2) the Purchaser or guarantor has:

i. a current rating for its senior unsecured debt of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

ii. tangible net worth at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

iii. tangible net worth of at least $10 million; and

iv. assets located in the United States amounting to at least 90 percent of total assets or at least six times the sum of the Estimated Cost of the Work and the amounts, if any, of other federal, state, or tribal environmental obligations financially assured through the use of a financial test or guarantee; and

b. submit to EPA for Purchaser or guarantor: (1) a copy of an independent certified public accountant's report of the entity's financial statements for the latest completed fiscal year, which must not express an adverse opinion or disclaimer of opinion; and (2) a letter from its chief financial officer and a report from an independent certified public accountant substantially identical to the sample letter and reports available from EPA. As of the date of signature of this Settlement, a sample letter and report are available under the "Financial Assurance - Orders" subject list category on the Cleanup Enforcement Model Language and Sample Documents Database at https://cfpub.epa.gov/compliance/models/.

58. If Purchaser is providing financial assurance by means of a demonstration or guarantee under ¶ 55.d or 55.e, it shall also:

a. annually resubmit to EPA the documents described in ¶ 57.b within 90 days after the close of Purchaser's or guarantor's fiscal year;

b. notify EPA within 30 days after Purchaser or guarantor determines that it no longer satisfies the relevant financial test criteria and requirements set forth in this Section; and

c. provide to EPA, within 30 days of EPA's request, reports of the financial condition of Purchaser or guarantor in addition to those specified in ¶ 57; EPA may make a request at any time based on a belief that the Purchaser or guarantor may no longer meet the financial test requirements of this Section.

59. Not more than 30 days after EPA provides Purchaser with EPA's Action Memorandum, Purchaser shall seek EPA's approval of the form of Purchaser's financial assurance. Within 30 days after EPA's approval, Purchaser shall secure all executed or otherwise finalized mechanisms or other documents consistent with the EPA-approved form of financial assurance and shall submit these mechanisms and documents to EPA, the Regional Financial Management Officer, and DOJ.

60. Purchaser shall diligently monitor the adequacy of the financial assurance. If Purchaser becomes aware of any information indicating that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, Purchaser shall notify EPA of this information within seven days. If EPA determines that the financial assurance provided under this Section is inadequate or otherwise no longer satisfies the requirements of this Section, EPA will notify Purchaser of this determination. Purchaser shall, within 30 days after notifying EPA or receiving notice from EPA under this Paragraph, secure and submit to EPA for approval a proposal for a revised or alternative financial assurance mechanism that satisfies the requirements of this Section. EPA may extend this deadline for such time as is reasonably necessary for Purchaser, in the exercise of due diligence, to secure and submit to EPA a proposal for a revised or alternative financial assurance mechanism, not to exceed 60 days. Purchaser shall follow the procedures of ¶ 62 in seeking approval of, and submitting documentation for, the revised or alternative financial assurance mechanism. Purchaser's inability to secure financial assurance in accordance with this Section does not excuse performance of any other requirement of this Settlement.

61. Access to Financial Assurance

a. If EPA issues a notice of a Work Takeover under ¶ 44, then, in accordance with any applicable financial assurance mechanism, EPA may require: (i) the performance of the Work; and/or (ii) that any funds guaranteed be deposited into the standby trust fund.

b. If EPA is notified that the issuer of a financial assurance mechanism intends to cancel the mechanism, and Purchaser fails to provide an alternative financial assurance mechanism in accordance with this Section at least 30 days prior to the cancellation date, EPA may, prior to cancellation, direct the financial assurance provider to deposit any funds guaranteed under this mechanism into the standby trust fund for use consistent with this Section.

62. **Modification of Amount, Form, or Terms of Financial Assurance.** On any anniversary of the Effective Date, or at any time agreed to by the Parties, Purchaser may submit

a request to change the form, terms, or amount of the financial assurance mechanism. Purchaser shall submit any such request to EPA in accordance with ¶ 59, and shall include an estimate of the cost of the remaining Work, an explanation of the bases for the cost calculation, and a description of the proposed changes, if any, to the form or terms of the financial assurance. EPA will notify Purchaser of its decision regarding the request. Purchaser may modify the form, terms, or amount of the financial assurance mechanism only: (a) in accordance with EPA's approval; or (b) in accordance with any resolution of a dispute under Section XIII. Purchaser may initiate dispute resolution under Section XIII regarding EPA's decision about a request to change the amount of financial assurance. Any decision made by EPA on a request to change the form or terms of a financial assurance mechanism shall not be subject to challenge by Purchaser pursuant to the dispute resolution provisions under Section XIII. Purchaser shall submit to EPA, within 30 days after receipt of EPA's approval or consistent with the terms of the resolution of the dispute, documentation of the change to the form, terms, or amount of the financial assurance instrument.

63. **Release, Cancellation, or Discontinuation of Financial Assurance.** Purchaser may release, cancel, or discontinue any financial assurance provided under this Section only: (a) if EPA issues a notice of completion of work under ¶ 42; (b) in accordance with EPA's approval of such release, cancellation, or discontinuation; or (c) if there is a dispute regarding the release, cancellation, or discontinuance of any financial assurance, in accordance with the agreement or final administrative decision resolving such dispute under Section XIII.

X. INDEMNIFICATION AND INSURANCE

64. **Indemnification**

a. The United States and the State do not assume any liability by entering into this Settlement or by virtue of any designation of Purchaser as EPA's or the State's authorized representatives under section 104(e)(1) of CERCLA. Purchaser shall indemnify and save and hold harmless the United States and the State and their officials, agents, employees, contractors, subcontractors, and representatives for or from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Purchaser, its officers, directors, employees, agents, contractors, or subcontractors, and any persons acting on Purchaser's behalf or under its control, in carrying out activities under this Settlement, including any claims arising from any designation of Purchaser as EPA's authorized representatives under section 104(e)(1) of CERCLA. Further, Purchaser agrees to pay the United States and the State all costs they incur, including attorneys' fees and other expenses of litigation and settlement arising from, or on account of, claims made against the United States or the State based on negligent or other wrongful acts or omissions of Purchaser, its officers, directors, employees, agents, contractors, subcontractors, and any persons acting on its behalf or under its control, in carrying out activities under this Settlement. The United States and the State shall not be held out as a party to any contract entered into by or on behalf of Purchaser in carrying out activities under this Settlement. Purchaser and any contractor may not be considered an agent of the United States or the State.

b. The United States or the State shall give Purchaser notice of any claim for which the United States or the State plans to seek indemnification under this ¶ 64, and shall consult with Purchaser prior to settling a claim.

65. Purchaser covenants not to sue and shall not assert any claim or cause of action against the United States and the State for damages or reimbursement or for set-off of any payments made or to be made to the United States or the State, arising from or on account of any contract, agreement, or arrangement between Purchaser and any person for performance of Work or other activities on or relating to the Site, including claims on account of construction delays. In addition, Purchaser shall indemnify and save and hold the United States and the State harmless with respect to any claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Purchaser and any person for performance of work on or relating to the Site, including claims on account of construction delays.

66. **Insurance.** Purchaser shall secure, by no later than 15 days before commencing any Work on the Property, the following insurance: (a) commercial general liability insurance with limits of liability of $1 million per occurrence; (b) automobile liability insurance with limits of liability of $1 million per accident; and (c) umbrella liability insurance with limits of liability of $5 million in excess of the required commercial general liability and automobile liability limits. The insurance policy shall name EPA and DEQ as additional insureds with respect to all liability arising out of the activities performed by or on behalf of Purchaser under this Settlement. Purchaser shall maintain this insurance until the first anniversary after issuance of EPA's notice of completion of work under ¶ 42. In addition, for the duration of this Settlement, Purchaser shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the Work on behalf of Purchaser in furtherance of this Settlement. Prior to commencement of the Work, Purchaser shall provide to EPA and DEQ certificates of such insurance and a copy of each insurance policy. Purchaser shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date. If Purchaser demonstrates by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering all of the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Purchaser need provide only that portion of the insurance described above that is not maintained by the contractor or subcontractor. Purchaser shall ensure that all submittals to EPA under this Paragraph identify the Richardson Flat Tailings Site and the CERCLA docket number for this action.

XI. PAYMENT FOR RESPONSE COSTS

67. **Payments for Future Response Costs**

a. **Periodic Bills.** On a periodic basis, EPA will send Purchaser a bill for Future Response Costs, including a standard cost summary listing direct costs paid by EPA and DOJ and related indirect costs. Purchaser may initiate a dispute under Section XIII regarding a Future Response Cost billing, but only if the dispute relates to one or more of the following issues: (i) whether EPA has made an arithmetical error; (ii) whether EPA has included a cost item that is not within the definition of Future Response Costs; or (iii) whether EPA has paid

excess costs as a direct result of an EPA action that was inconsistent with a specific provision or provisions of the NCP. Purchaser shall specify in the Notice of Dispute the contested costs and the basis for the objection.

b. **Payment of Bill.** Purchaser shall pay the bill, or if it initiates dispute resolution under Section XIII, the uncontested portion of the bill, if any, within 30 days after receipt of the bill. Purchaser shall pay the contested portion of the bill determined to be owed, if any, within 30 days after the determination regarding the dispute. Each payment for: (i) the uncontested bill or portion of bill, if late, and; (ii) the contested portion of the bill determined to be owed, if any, shall include an additional amount for Interest accrued from the date of receipt of the bill through the date of payment.

68. **Payment Instructions.** Purchaser shall make all payments at https://www.pay.gov using the "EPA Miscellaneous Payments Cincinnati Finance Center" link and include references to the CERCLA docket number and Site/Spill ID number listed in ¶ 103 and the purpose of the payment. Purchaser shall send notices of this payment to EPA and include these references.

69. **Deposit of Payments.** EPA will deposit the amounts paid under ¶ 67 in the Fund.

XII. FORCE MAJEURE

70. "Force Majeure," for purposes of this Settlement, means any event arising from causes beyond the control of Purchaser, of any entity controlled by Purchaser, or of Purchaser's contractors that delays or prevents the performance of any obligation under this Settlement despite Purchaser's best efforts to fulfill the obligation. Given the need to protect public health and welfare and the environment, the requirement that Purchaser exercise "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential force majeure and best efforts to address the effects of any potential force majeure (a) as it is occurring and (b) following the potential force majeure such that the delay and any adverse effects of the delay are minimized to the greatest extent possible. "Force majeure" does not include financial inability to complete the Work or increased cost of performance

71. If any event occurs for which Purchaser will or may claim a force majeure, Purchaser shall notify EPA's RPM by email. The deadline for the initial notice is 3 days after the date Purchaser first knew or should have known that the event would likely delay performance. Purchaser shall be deemed to know of any circumstance of which any contractor of, subcontractor of, or entity controlled by Purchaser knew or should have known. Within 3 days thereafter, Purchaser shall send a further notice to EPA that includes: (i) a description of the event and its effect on Purchasers' completion of the requirements of the Settlement; (ii) a description of all actions taken or to be taken to prevent or minimize the delay; (iii) the proposed extension of time for Purchaser to complete the requirements of the Settlement; (iv) a statement as to whether, in the opinion of Purchaser, the event may cause or contribute to an endangerment to public health or welfare, or the environment; and (v) all available proof supporting its claim of force majeure. Failure to comply with the notice requirements herein regarding an event precludes Purchaser from asserting any claim of force majeure regarding that event, provided,

however, that if EPA, despite the late or incomplete notice, is able to assess to its satisfaction whether the event is a force majeure under ¶ 70 and whether Purchaser has exercised best efforts under ¶ 70, EPA may, in its unreviewable discretion, excuse in writing Purchaser's failure to submit timely or complete notices under this Paragraph.

72. EPA will notify Purchaser of its determination whether Purchaser is entitled to relief under ¶ 70, and, if so, the duration of the extension of time for performance of the obligations affected by the force majeure. An extension of the time for performance of the obligations affected by the force majeure shall not, of itself, extend the time for performance of any other obligation. Purchaser may initiate dispute resolution under Section XIII regarding EPA's determination within 15 days after receipt of the determination. In any such proceeding, Purchaser has the burden of proving that it is entitled to relief under ¶ 70 and that its proposed extension was or will be warranted under the circumstances.

73. The failure by EPA to timely complete any activity under this Settlement is not a violation of the Settlement, provided, however, that if such failure prevents Purchaser from meeting one or more deadlines under this Settlement, Purchaser may seek relief under this Section.

XIII. DISPUTE RESOLUTION

74. Unless otherwise provided in this Settlement, Purchaser shall use the dispute resolution procedures of this Section to resolve any dispute arising under this Settlement. Purchaser shall not initiate a dispute challenging the Response Action.

75. A dispute will be considered to have arisen when Purchaser sends EPA a timely written notice of dispute ("Notice of Dispute"). A notice is timely if sent within 30 days after receipt of the EPA notice or determination giving rise to the dispute or within 15 days in the case of a force majeure determination. Disputes arising under this Settlement must in the first instance be the subject of informal negotiations between EPA and Purchaser. The period for informal negotiations may not exceed 60 days after the dispute arises, unless EPA otherwise agrees. If the parties cannot resolve the dispute by informal negotiations, the position advanced by EPA is binding unless Purchaser initiates formal dispute resolution under ¶ 76.

76. **Formal Dispute Resolution**

a. **Statements of Position.** Purchaser may initiate formal dispute resolution by submitting to EPA, within 7 days after the conclusion of informal dispute resolution under ¶ 75, an initial Statement of Position regarding the matter in dispute. EPA's responsive Statement of Position is due within 30 days after receipt of the initial Statement of Position. All statements of position must include supporting factual data, analysis, opinion, and other documentation. A reply, if any, is due within 10 days after receipt of the response. If appropriate, EPA may extend the deadlines for filing statements of position for up to 15 days or as otherwise agreed to by the Parties and may allow the submission of supplemental statements of position.

b. **Formal Decision.** The Director of the Superfund & Emergency Management Division, EPA Region 8, will issue a formal decision resolving the dispute ("Formal Decision") based on the statements of position and any replies and supplemental statements of position. The Formal Decision is binding on Purchaser and shall be incorporated into and become an enforceable part of this Settlement.

77. **Escrow Account**. For disputes regarding a Future Response Costs billing, Purchaser shall: (a) establish, in a duly chartered bank or trust company, an interest-bearing escrow account that is insured by the Federal Deposit Insurance Corporation ("FDIC"); (b) remit to that escrow account funds equal to the amount of the contested Future Response Costs; and (c) send to EPA copies of the correspondence and of the payment documentation (e.g., the check) that established and funded the escrow account, including the name of the bank, the bank account number, and a bank statement showing the initial balance in the account. EPA may, in its unreviewable discretion, waive the requirement to establish the escrow account. Purchaser shall cause the escrow agent to pay the amounts due to EPA under ¶ 67, if any, by the deadline for payment in ¶ 67. Purchaser is responsible for any balance due under ¶ 67 after the payment by the escrow agent.

78. The initiation of dispute resolution procedures under this Section does not extend, postpone, or affect in any way any requirement of this Settlement, except as EPA agrees. Stipulated penalties with respect to the disputed matter will continue to accrue, but payment is stayed pending resolution of the dispute, as provided in ¶ 81.

XIV. STIPULATED PENALTIES

79. Unless noncompliance is excused under ¶37.b or Section XII (Force Majeure), Purchaser is liable to the United States for the following stipulated penalties:

a. for any failure: (i) to pay any amount due under Section XI (Payment for Response Costs); (ii) to establish and maintain financial assurance in accordance with Section IX (Financial Assurance); and (iii) to submit timely or adequate deliverables under this Settlement.

Period of Noncompliance	Penalty Per Noncompliance Per Day
1st through 14th day	$100
15th through 30th day	$200
31st day and beyond	$250

80. **Work Takeover Penalty.** If EPA commences a Work Takeover, Purchaser is liable for a stipulated penalty in the amount of $10,000. This stipulated penalty is in addition to the remedy available to EPA under ¶ 61 (Access to Financial Assurance).

81. **Accrual of Penalties**

a. Stipulated penalties accrue from the date performance is due, or the day a noncompliance occurs, whichever is applicable, until the date the requirement is completed or

the final day of the correction of the noncompliance. Nothing in this Settlement prevents the simultaneous accrual of separate penalties for separate noncompliances with this Settlement. Stipulated penalties accrue regardless of whether Purchaser has been notified of its noncompliance, and regardless of whether Purchaser has initiated dispute resolution under Section XIII, provided, however, that no penalties will accrue as follows:

(1) with respect to a submission that EPA determines requires revision under ¶ 35, during the period, if any, beginning on the 31st day after EPA's receipt of the submission until the date that EPA notifies Purchaser of any need for revision; or

(2) with respect to a matter that is the subject of dispute resolution under Section XIII, during the period, if any, beginning on the 21st day after the later of the date that EPA's Statement of Position is received or the date that Purchaser's reply thereto (if any) is received until the date of the Formal Decision under ¶ 76.

b. If EPA requires revision under ¶ 35, stipulated penalties for revisions to an original deliverable submission accrue during the specified period allowed for resubmission, but are not payable unless the resubmission is disapproved in whole or in part; provided that, if the original deliverable submission was so deficient as to constitute a bad faith lack of effort by the Purchaser, the stipulated penalties applicable to the original deliverable submission are due and payable notwithstanding any subsequent resubmission.

82. **Demand and Payment of Stipulated Penalties.** EPA may send Purchaser a demand for stipulated penalties. The demand will include a description of the noncompliance and will specify the amount of the stipulated penalties owed. Purchaser may initiate dispute resolution under Section XIII within 30 days after receipt of the demand. Purchaser shall pay the amount demanded or, if Purchaser initiate dispute resolution, the uncontested portion of the amount demanded, within 30 days after receipt of the demand. Purchaser shall pay the contested portion of the penalties determined to be owed, if any, within 30 days after the resolution of the dispute. Each payment for: (a) the uncontested penalty demand or uncontested portion, if late, and; (b) the contested portion of the penalty demand determined to be owed, if any, shall include an additional amount for Interest accrued from the date of receipt of the demand through the date of payment. Purchaser shall make payment at https://www.pay.gov using the link for "EPA Miscellaneous Payments Cincinnati Finance Center," including a reference to the CERCLA docket number and Site/Spill ID number listed in ¶ 103, and the purpose of the payment. Purchaser shall send a notice of this payment to DOJ and EPA, in accordance with ¶ 103. The payment of stipulated penalties and Interest, if any, does not alter any obligation by Purchaser under this Settlement.

83. Nothing in this Settlement limits the authority of the United States: (a) to seek any remedy otherwise provided by law for Purchaser's failure to pay stipulated penalties or interest; or (b) to seek any other remedies or sanctions available by virtue of Purchaser's noncompliance with this Settlement or of the statutes and regulations upon which it is based including penalties under section 106(b) of CERCLA provided, however, that the United States may not seek civil

penalties under section 106(b) for any noncompliance for which a stipulated penalty is provided herein, except in the case of a willful noncompliance with this Settlement or in the event that EPA assumes performance of a portion or all of the Work pursuant to ¶ 44 (Work Takeover).

84. Notwithstanding any other provision of this Section, the United States may, in its unreviewable discretion, waive any portion of stipulated penalties that have accrued under this Settlement.

XV. CERTIFICATION

85. Purchaser certifies to the best of its knowledge and belief that after thorough inquiry (a) it is a BFPP; (b) it has fully and accurately disclosed to EPA all information known to Purchaser and all information in the possession or control of its officers, directors, employees, contractors and agents that relates in any way to any Existing Contamination or any past or potential future release of hazardous substances, pollutants or contaminants at or from the Site; and (c) it has not altered, mutilated, discarded, destroyed or otherwise disposed of any documents and electronically stored information relating to the Site.

XVI. COVENANTS BY UNITED STATES AND THE STATE

86. **Covenants for Purchaser.** Subject to ¶ 89, the United States covenants not to sue or take administrative action against Purchaser under sections 106, and 107(a), of CERCLA for Existing Contamination, the Work, and payments made under Section XI (Payment for Response Costs), and the State covenants not to sue or take administrative action against Purchaser pursuant to HSMA and section 107(a) of CERCLA for Existing Contamination and the Work.

87. The covenants under ¶ 86: (a) take effect upon the Effective Date; (b) are conditioned on (i) the satisfactory performance by Purchaser of the requirements of this Settlement; and (ii) the veracity of the information provided to EPA by Purchaser relating to Purchaser's involvement with the Site and the certification made by Purchaser in ¶ 85; (c) extend to the successors of Purchaser but only to the extent that the successor of the Purchaser is assuming all obligations under this Settlement and the alleged liability of the successor of the Purchaser is based solely on its status as a successor of the Purchaser; and (d) do not extend to any other person.

88. Nothing in this Settlement constitutes a covenant not to sue or not to take action or otherwise limits the ability of the United States, State, DEQ, or EPA to seek or obtain further relief from Purchaser if the information provided to EPA by Purchaser relating to Purchaser's involvement with the Site or the certification made by Purchaser in ¶ 85 is false or in any material respect inaccurate.

89. **General Reservations.** Notwithstanding any other provision of this Settlement, the United States and State reserve, and this Settlement is without prejudice to, all rights against Purchaser regarding the following:

a. liability for failure by Purchaser to meet a requirement of this Settlement;

b. liability resulting from an act or omission that causes exacerbation of Existing Contamination by Purchaser, its successors, assigns, lessees, or sublessees;

c. liability resulting from the disposal, release or threat of release of hazardous substances, pollutants or contaminants at or in connection with the Site after the Effective Date, not within the definition of Existing Contamination;

d. liability arising from the past, present, or future disposal, release or threat of release of Waste Material outside of the Site, except as provided in clause c of the definition of Existing Contamination;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments; and

f. criminal liability.

90. With respect to any claim or cause of action asserted by the United States, Purchaser shall bear the burden of proving that the claim or cause of action, or any part thereof, is attributable solely to Existing Contamination and that Purchaser has complied with all of the requirements of CERCLA section 101(40) and 107(r).

91. Subject to ¶ 86, nothing in this Settlement limits any authority of the United States, State, DEQ, or EPA to take, direct, or order all appropriate action to protect public health and welfare and the environment or to prevent, abate, respond to, or minimize an actual or threatened release of Waste Material on, at, or from the Site, or to request a Court to order such action. Further, except as specifically provided in this Settlement, nothing in this Settlement shall prevent the United States or the State from seeking legal or equitable relief to enforce the terms of this Settlement or from taking other legal or equitable action as it deems appropriate and necessary.

XVII. COVENANTS BY PURCHASER

92. **Covenants by Purchaser**

a. Subject to ¶ 93, Purchaser covenants not to sue and shall not assert any claim or cause of action against the United States or State under CERCLA, section 7002(a) of RCRA, the United States Constitution, the Tucker Act, 28 U.S.C. § 1491, the Equal Access to Justice Act, 28 U.S.C. § 2412, the State Constitution, State law, or at common law regarding Existing Contamination, the Work, payments under Section XI (Payment for Response Costs), and this Settlement.

b. Subject to ¶ 93, Purchaser covenants not to seek reimbursement from the Fund through CERCLA or any other law for the costs regarding the Existing Contamination, the costs of the Work, payments under Section XI (Payment for Response Costs), or any claim arising out of response actions at or in connection with the Site.

93. **Purchaser's Reservation.** The covenants in ¶ 92 do not apply to any claim or cause of action brought, or order issued, after the Effective Date by the United States or the State to the extent a claim, cause of action, or order is within the scope of a reservation under ¶¶ 89.a through 89.e.

XVIII. EFFECT OF SETTLEMENT; CONTRIBUTION

94. Except as provided in Section XVII (Covenants by Purchaser), each of the Parties expressly reserves any and all rights (including under section 113 of CERCLA), defenses, claims, demands, and causes of action that each Party may have with respect to any matter, transaction, or occurrence relating in any way to the Site against any person not a Party hereto.

95. The Parties agree that: (a) this Settlement constitutes an administrative settlement under which Purchaser has, as of the Effective Date, resolved liability to the United States within the meaning of sections 113(f)(2) and 113(f)(3)(B) of CERCLA; and (b) Purchaser is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by section 113(f)(2) of CERCLA, or as may be otherwise provided by law, for the "matters addressed" in this Settlement. The "matters addressed" in this Settlement are the Work, payments under Section XI (Payment for Response Costs), and all response actions taken or to be taken and all response costs incurred or to be incurred in connection with Existing Contamination by the United States or any other person. However, if the United States exercises rights under the reservations in ¶¶ 89.a through 89.e, the "matters addressed" in this Settlement will no longer include those response costs or response actions or natural resource damages that are within the scope of the exercised reservation.

96. Purchaser shall, with respect to any suit or claim brought by it for matters related to this Settlement, notify DOJ, EPA and DEQ in writing no later than 60 days prior to the initiation of a suit or claim. Purchaser shall, with respect to any suit or claim brought against it for matters related to this Settlement, notify DOJ, EPA and DEQ in writing within 10 days after service of the complaint or claim upon Purchaser. In addition, Purchaser shall notify DOJ and EPA within 10 days after service or receipt of any Motion for Summary Judgment and within 10 days after receipt of any order from a court setting a case for trial, for matters related to this Settlement.

97. Nothing in this Settlement diminishes the right of the United States under sections 113(f)(2) and (3) of CERCLA to pursue any person not a Party to this Settlement to obtain additional response costs or response actions and to enter into settlements that give rise to contribution protection pursuant to section 113(f)(2).

XIX. RECORDS

98. **Retention of Records and Information**

a. Purchaser shall retain, and instruct their contractors and agents to retain, the following documents and electronically stored data ("Records") until 10 years after a notice of completion of the work under ¶ 42 ("Record Retention Period"):

(1) All records regarding Existing Contamination or any release or threat of release of hazardous substances, pollutants or contaminants at or from the Site.

(2) All records regarding Purchaser's liability and the liability of any other person under CERCLA regarding the Site;

(3) All reports, plans, permits, and documents submitted to EPA in accordance with this Settlement, including all underlying research and data; and

(4) All data developed by, or on behalf of, Purchaser in the course of performing the Work.

b. At the end of the Record Retention Period, Purchaser shall notify EPA and DEQ that they have 90 days to request the Purchaser's Records subject to this Section. Purchaser shall retain and preserve its Records subject to this Section until 90 days after EPA's and DEQ's receipt of the notice. These record retention requirements apply regardless of any corporate record retention policy.

99. Purchaser shall provide to EPA and DEQ, upon request, copies of all Records and information required to be retained under this Section. Purchaser shall also comply, as required by law, with any authorized request for information or administrative subpoena issued by EPA or the State.

100. **Privileged and Protected Claims**

a. Purchaser may assert that all or part of a record requested by EPA or DEQ is privileged or protected as provided under federal law, in lieu of providing the record, provided that Purchaser complies with ¶ 100.b, and except as provided in ¶ 100.c.

b. If Purchaser asserts a claim of privilege or protection, it shall provide EPA and DEQ with the following information regarding the record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a record, Purchaser shall provide the record to EPA in redacted form to mask the privileged or protected portion only. Purchaser shall retain all records that they claim to be privileged or protected until EPA or DEQ has had a reasonable opportunity to dispute the privilege or protection claim and any dispute has been resolved in Purchaser's favor.

c. Purchaser shall not make any claim of privilege or protection regarding: (1) any data regarding the Site, including all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological or engineering data, or the portion of any other record that evidences conditions at or around the Site; or (2) the portion of any record that Purchaser is required to create or generate in accordance with this Settlement.

101. **Confidential Business Information (CBI) Claims**. Purchaser is entitled to claim that all or part of a record submitted to EPA or DEQ under this Section is Confidential Business Information ("CBI") that is covered by section 104(e)(7) of CERCLA and 40 C.F.R. § 2.203(b). Purchaser shall segregate all records or parts thereof submitted under this Settlement for which it claims are CBI and label them as "claimed as confidential business information" or "claimed as CBI." Records that Purchaser properly labels in accordance with the preceding sentence will be afforded the protections specified in 40 C.F.R. part 2, subpart B. If the records are not properly labeled when they are submitted to EPA and/or DEQ, or if EPA and/or DEQ notifies Purchaser that the records are not entitled to confidential treatment 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 these records without further notice to Purchaser.

102. Notwithstanding any provision of this Settlement, EPA and DEQ retain all of their information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, HSMA and any other applicable statutes or regulations.

XX. NOTICES AND SUBMISSIONS

103. All agreements, approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, waivers, and requests specified in this Settlement shall be in writing unless otherwise specified. Whenever a notice is required to be given or a report or other document is required to be sent by one Party to another under this Settlement, it shall be sent as specified below. All notices under this Section are effective upon receipt, unless otherwise specified. In the case of emailed notices, there is a rebuttable presumption that such notices are received on the same day that they are sent. Any Party may change the method, person, or address applicable to it by providing notice of a change to all Parties.

As to DOJ:	*via email to*: eescdcopy@usdoj.gov Re: DJ# 90-11-3-12653
As to EPA:	*via email to*: hou.james@epa.gov, piggott.amelia@epa.gov and hogue.matthew@epa.gov Re: Site/Spill ID # 0894
As to the Regional Financial Management Officer:	*via email to*: johnson.davionn@epa.gov Re: Site/Spill ID # 0894
As to Purchaser:	*via email to*: cameron.jackson@lhm.com; aida@lhm.com; brad.cahoon@dentons.com and davidwilson.wilson@tetratech.com

As to the State: *Via email to:*

mpetit@utah.gov and kmcewan@agutah.gov

XXI. APPENDIXES

104. The following appendixes are attached to and incorporated into this Settlement.

"Appendix A" is the description and map of the Property.

"Appendix B" is the map of the Site.

"Appendix C" is the approved Response Action Work Plan and its appendixes.

"Appendix D" is the sample Transferee written certification.

XXII. MODIFICATION

105. If the RPM determines a modification to any approved deliverable submitted to EPA after the Effective Date is appropriate, the RPM may make such modification in writing or by oral direction. EPA will promptly memorialize in writing any oral modification, but the modification has as its effective date the date of the RPM's oral direction, unless otherwise indicated. Any other requirements of this Settlement may be modified by mutual agreement of the Parties, and any modification has as its effective date the date of signature by all Parties.

106. If Purchaser seeks permission to deviate from any approved deliverable, Purchaser's Project Coordinator shall submit a written request to the RPM outlining the proposed modification and its basis. Purchaser may not proceed with a requested modification under this Paragraph until receiving approval under ¶ 105.

107. No informal advice, guidance, suggestion, or comment by the RPM, SPM, or other EPA or DEQ representatives regarding any deliverable submitted by Purchaser shall relieve Purchaser of its obligation to obtain any formal approval required by this Settlement, or to comply with all requirements of this Settlement, unless it is formally modified.

XXIII. SIGNATORIES

108. The undersigned representative of the Parties certifies that the signatory is authorized to enter into the terms and conditions of this Settlement and to execute and legally bind Purchaser to this Settlement.

XXIV. DISCLAIMER

109. This Settlement is in no way a finding by EPA or DEQ as to the risks to human health and the environment that may be posed by contamination at the Property or the Site or a representation by EPA or DEQ that the Property or the Site is fit for any particular purpose.

XXV. ENFORCEMENT

110. The Parties agree that the United States District Court for the District of Utah ("Court") will have jurisdiction, including under section 113(b) of CERCLA for any judicial enforcement action brought with respect to this Settlement.

111. Notwithstanding ¶ 86 of this Settlement, if Purchaser fails to comply with the terms of this Settlement, the United States may file a lawsuit for breach of this Settlement, or any provision thereof, in the Court. In any such action, Purchaser consents to and agrees not to contest the exercise of personal jurisdiction over it by the Court. Purchaser further acknowledges that venue in the Court is appropriate and agrees not to raise any challenge on this basis.

112. If the United States files a civil action as contemplated by ¶ 111, to remedy breach of this Settlement, the United States may seek, and the Court may grant as relief, the following: a) an order mandating specific performance of any term or provision in this Settlement, without regard to whether monetary relief would be adequate; and b) any additional relief that may be authorized by law or equity.

XXVI. INTEGRATION

113. This Settlement constitutes the entire agreement among the Parties regarding the subject matter of the Settlement and supersedes all prior representations, agreements, and understandings, whether oral or written, regarding the subject matter of the Settlement.

XXVII. PUBLIC COMMENT

114. This Settlement is subject to a 30-day public comment period, after which the United States may withdraw its consent or seek to modify this Settlement if comments received disclose facts or considerations that indicate that this Settlement is inappropriate, improper, or inadequate.

XXVIII. EFFECTIVE DATE

115. The Effective Date of this Settlement is the date upon which EPA issues written notice to Purchaser that the United States, after review of and response to any public comments received, will not withdraw consent or seek to modify this Settlement.

XXIX. ELECTRONIC SIGNATURES

116. This Settlement may be executed electronically as one instrument signed in counterparts, each of which is an original and all of which are one instrument, and any signed counterpart may be signed and delivered by scan and email.

IT IS SO AGREED:

LHM DEV RIH LLC, a Utah limited liability company

By: LHMRE, LLC, a Utah limited liability company

BY: Docusigned by: Bradley Holmes F77B5E227A854D3...

Bradley Holmes, President
9350 South 150 East, St. 900
Sandy, Utah 84070

Signature Page for Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser regarding the Richardson Flat Tailings Superfund Site, Operable Unit 1

IT IS SO AGREED:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BY:

CHRISTOPHER THOMPSON

Digitally signed by CHRISTOPHER THOMPSON
Date: 2026.03.05 08:45:34 -07'00'

Christopher Thompson
Associate Regional Counsel for Enforcement
U.S. Environmental Protection Agency, Region 8

AARON URDIALES

Digitally signed by AARON URDIALES
Date: 2026.03.04 08:36:13 -07'00'

Aaron Urdiales
Director, Office of Superfund and Emergency Division
U.S. Environmental Protection Agency, Region 8

Signature Page for Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser regarding the Richardson Flat Tailings Superfund Site, Operable Unit 1

IT IS SO AGREED:

UNITED STATES DEPARTMENT OF JUSTICE

BY:

Adam R.F. Gustafson
Principal Deputy Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division

JAMES FREEMAN Digitally signed by JAMES FREEMAN
Date: 2026.03.03 15:18:55 -07'00'

James D. Freeman
Senior Counsel
Environmental Enforcement Section
U.S. Department of Justice

Signature Page for Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser regarding the Richardson Flat Tailings Superfund Site, Operable Unit 1

IT IS SO AGREED:

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

BY: Tim Davis (Dec 22, 2025 13:38:59 MST)

Name: Tim Davis

Its: Executive Director

Title:

Date: 12/22/2025

Appendix A

“THE PROPERTY” OU1 AND PORTION OF OU3

A parcel of land lying and situate in the East Half of Section 2 and all of Section 1, Township 3 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the Summit County aluminum cap monument marking the Northwest Corner of said Section 2, thence South 89°49’54” East 1338.78 feet coincident with the north line of said Section 2 to the True Point of Beginning;
Thence South 89°49’54” East 757.70 feet to a point on the southerly right of way of SR-248; Thence the following six (6) courses coincident with said right of way, 1) Easterly 880.04 feet along the arc of a 5829.58 foot radius curve to the left (center bears North 25°15’10” East) through a central angle of 08°38’58” to a point on the east line of said Section 2; 2) Continuing Easterly 818.68 feet along the arc of a 5829.58 foot curve to the left (center bears North 16°36’12” East) through a central angle of 08°02’47” to a right of way monument; 3) South 71°25’55” East 227.74 feet to a right of way monument; 4) South 81°28’18” East 700.04 feet to a right of way monument; 5) South 76°53’21” East 501.60 feet to a right of way monument; 6) South 81°27’28” East 39.17 feet; Thence departing said right of way South 32°32’16” East 1843.50 feet; Thence South 36°48’55” West 616.47 feet; Thence South 77°38’32” West 605.69 feet; Thence South 27°51’36” West 924.31 feet; Thence North 82°34’51” West 1191.60 feet; Thence South 49°32’15” West 911.04 feet to a point on the east line of said Section 2; Thence North 00°37’20” East 240.40 feet coincident with said east section line; Thence North 89°57’56” West 189.47 feet; Thence North 19°53’05” West 2477.71 feet; Thence Northerly 467.05 feet along the arc of a 1451.68 foot radius curve to the right (center bears North 70°01’10” East) through a central angle of 18°26’01” to a point of tangency; Thence North 01°51’07” West 645.10 feet; Thence Southwesterly 591.39 feet along the arc of a 1959.86 feet (center bears North 72°43’28” West) through a central angle of 17°17’21” to a point of tangency; Thence South 34°33’53” West 799.27 feet to a point on the east right of way of U.S. Highway 40; Thence the following six (6) course coincident with said east right of way, 1) North 07°03’54” West 150.63 feet; 2) North 07°00’58” West 206.41 feet; 3) North 03°03’08” West 110.14 feet to a point of curvature; 4) Northerly 385.39 feet along the arc of a 2406.48 foot radius curve to the right (center bears North 86°56’52” East) through a central angle of 09° 10’33” to a point of tangency; 5) North 05°49’23” East 203.62 feet; 6) North 25°42’29” East 761.81 feet to the point of beginning.

Contains 283.30 acres, ±12,340,422 sq. ft.

“THE PROPERTY” P-1

A parcel of land lying and situate in the East Half of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the 1965 brass cap monument marking the Southeast Corner of said Section 2, thence North 00°37’20” East 1327.07 feet coincident with the east line of said Section 2; Thence North 89°57’56” West 189.47 feet to the True Point of Beginning:
Thence North 89°57’56” West 1415.78 feet to a point on the easterly right of way of U.S. Highway 40; Thence the following five (5) courses coincident with said easterly right of way, 1) North 07°00’58” West 672.29 feet to a right of way monument; 2) North 07°01’31” West 735.04 feet to a right of way monument; 3) North 07°00’41” West 599.61 feet; 4) North 01°35’19” East 203.30 feet; 5) North 07°17’03” West 47.94 feet; Thence departing said right of way North 34°33’53” East 799.27 feet to a point of curvature; Thence Northerly 591.39 feet along the arc of a 1959.86 foot radius curve to the left (center bears North 55°26’07” West) through a central angle of 17°17’21”; Thence South 01°51’07” East 645.10 feet to a point of curvature; Thence Southerly 467.05 feet along the arc of a 1451.68 foot radius curve to the left (center bears North 88°27’11” East) through a central angle of 18°26’01”; Thence South 19°53’05” East 2477.71 feet to the point of beginning.

Contains 68.63 acres, ±2,989,635 sq. ft.

“THE PROPERTY” P-2

A parcel of land lying and situate in the Southwest Quarter of Section 1, and the Northwest Quarter of Section 12, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Beginning at the 1965 brass cap monument marking the Southeast Corner of said Section 2, thence North 00°37’20” East 1086.67 feet coincident with the east line of said Section 2; Thence North 49°32’15” East 911.04 feet; Thence South 82°34’51” East 1191.60 feet; Thence North 27°51’36” East 924.31 feet; Thence North 77°38’32” East 375.28 feet to a point on the Center Quarter Section line of said Section 2; Thence South 00°46’27” West 2446.94 feet coincident with said Center Quarter Section line to the G.L.O. Stone Monument marking the South Quarter Corner thereof; Thence North 89°27’15” West 1326.19 feet coincident with said south section line to a number five rebar and cap stamped “PLS 356548”; Thence South 00°38’40” East 1332.30 feet to a number five rebar and cap stamped “PLS 356548”; Thence North 89°20’25” West 1347.18 feet to a point on the west line of the Northwest Quarter of said Section 12 and a number five rebar and cap stamped “PLS 356548”; Thence North 00°16’01” East 1329.35 feet coincident with the west line of said Northwest Quarter Section to the point of beginning.

Contains 145.46 acres, ±6,336,243 sq. ft.

“OTHER PROPERTY” P-3

A parcel of land lying and situate in the North Half of Section 1, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the number five rebar and cap stamped “ALLIANCE” which is marking the Center Quarter Section corner of said Section 1, thence South 89°47’09” East 350.84 feet coincident with the Center Quarter Section line of said Section 1 to the True Point of Beginning;
Thence North 36°48’55” East 401.57 feet; Thence North 32°32’16” West 1843.50 feet to a point on the southerly right of way of SR-248; Thence the following the following four (4) courses coincident with said right of way, 1) South 81°27’28” East 464.02 feet to a right of way monument; 2) South 78°53’16” East 621.14 feet; 3) South 85°26’42” East 192.99 feet; 4) North 88°37’03” East 459.21 feet to a number five rebar and cap stamped “PLS 356548”; Thence South 00°03’17” West 1263.34 feet to a number five rebar and cap stamped “PLS 356548”; Thence South 89°55’36” East 696.79 feet to a number five rebar and cap stamped “PLS 356548 and a point on the Summit-Wasatch County Line; Thence South 07°47’44” East 428.90 feet coincident with said County Line to a number five rebar and cap stamped “PLS 356548” to a point on the Center Quarter Section Line and a number five rebar and cap stamped “PLS 356548”; Thence North 89°47’09” West 1722.69 feet coincident with said Quater Section Line to the point of beginning.

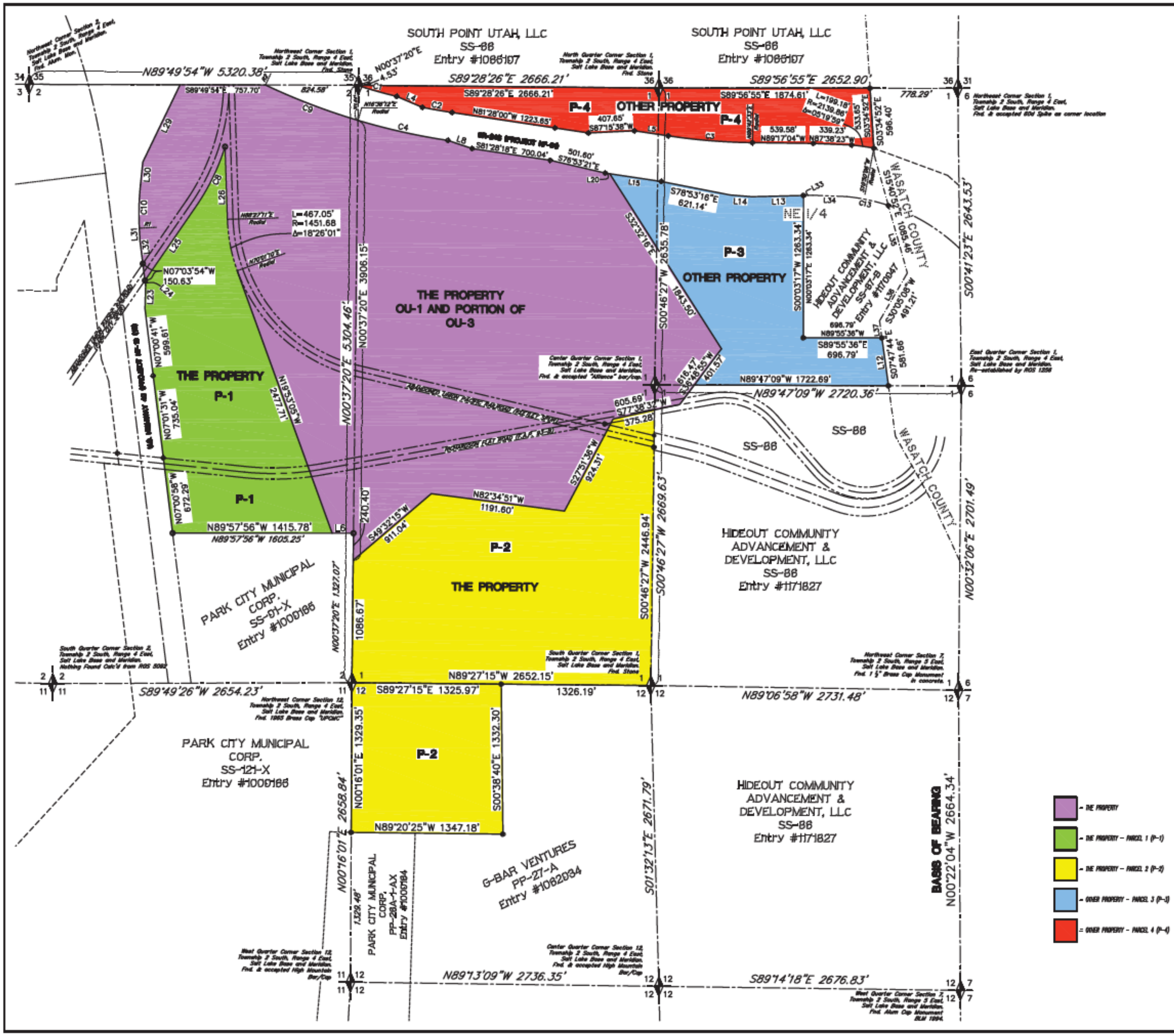
Contains 51.89 acre, ±2,260,176 sq. ft.

“OTHER PROPERTY” P-4

A parcel of land lying and situate in the North Half of Section 1, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Beginning at the G.L.O. stone monument marking the Northwest Corner of Section 1, Township 2 South, Range 4 East, Salt lake Base and Meridian, thence South 89°28’26” East 2666.21 feet coincident with the north line of said Northwest Quarter Section to the North Quarter Corner thereof; Thence South 89°56’55” East 1874.61 feet coincident with the north line of the Northeast Quarter of said Section 1 to a point on the Summit-Wasatch County Line and a number five rebar and cap stamped “PLS 356548”; Thence South 03°34’52” East 533.65 feet coincident with said County Line to a right of way monument; Thence the following ten (10) courses course coincident with the northerly right of way line of SR-248, 1) Westerly 199.18 feet along the arc of a 2139.86 foot radius curve to the left (center bears South 10°50’06” West) through a central angle of 05°19’59” to a point of tangency and a right of way monument; 2) North 87°38’23” West 339.23 feet to a right of way monument; 3) North 89°17’04” West 539.58 feet to a point of curvature and a right of way monument; 4) Westerly 751.35 feet along the arc of a 5502.89 foot radius curve to the right (center bears North 00°42’33” East) through a central angle of 07°49’23” to a point of tangency and a right of way monument; 5) North 81°30’35” West 303.73 feet to a right of way monument; 6) South 87°15’38” West 407.65 feet to a right of way monument; 7) North 81°28’00” West 1223.65 feet to a point of curvature and a right of way monument; 8) Westerly 268.80 feet along the arc of a 5579.56 foot radius curve to the right (center bears North 08°31’57” East) through a central angle of 02°45’37” to a right of way monument; 9) North 66°56’17” West 246.50 feet to a point on the arc of a 5534.58 foot radius curve; 10) Westerly 354.00 feet along the arc of said 5534.58 foot radius curve to the right (center bears North 13°44’15” East) through a central angle of 03°39’53” to a point on the west line of the Northwest Quarter of said Section 1; Thence departing said right of way North 00°37’20” East 4.53 feet coincident with said Quarter Section Line to the point of beginning.

Contains 37.81 acres, ±1,647,003 sq. ft.



LINE TABLE		
LINE	LENGTH	BEARING
L1	183.16'	S00°46'27"W
L2	446.53'	N79°45'59"E
L3	449.12'	N76°38'07"W
L4	246.50'	N66°56'17"W
L5	303.73'	N81°30'35"W
L6	189.47'	N89°57'56"W
L7	293.70'	S79°45'59"W
L8	227.74'	S71°25'55"E
L9	450.81'	S76°38'07"E
L10	401.57'	N36°48'55"E
L11	1843.40'	N32°32'16"W
L12	428.90'	S07°47'44"E
L13	459.21'	N88°37'03"E
L14	192.99'	S85°26'42"E
L15	464.02'	S81°27'28"E
L16	1843.40'	S32°32'16"E
L17	401.57'	S36°48'55"W
L18	165.65'	S00°46'27"W
L19	694.89'	S79°45'59"W
L20	39.17'	N81°27'28"W
L21	284.66'	N89°48'51"W
L22	249.55'	S76°38'07"E
L23	203.30'	N01°35'19"E
L24	47.94'	N07°17'03"W
L25	799.27'	N34°33'53"E
L26	645.10'	S01°51'07"E
L27	686.68'	S34°34'04"W
L28	91.04'	S03°49'24"W
L29	761.81'	N25°42'29"E
L30	203.62'	N05°49'23"E
L31	110.14'	N03°03'08"W
L32	206.41'	N07°00'58"W
L33	82.06'	N88°33'02"E
L34	300.62'	S87°43'00"E
L35	622.57'	S15°40'52"E
L36	491.21'	S30°05'08"W
L37	152.75'	S07°47'44"E

CURVE TABLE			
CURVE	LENGTH	RADIUS	DELTA
C1	354.00'	5534.58'	03°39'53"
C2	268.80'	5579.56'	02°45'37"
C3	751.34'	5502.89'	07°49'23"
C4	818.68'	5829.58'	08°02'47"
C5	682.47'	2418.90'	16°09'56"
C6	88.04'	889.28'	05°40'20"
C7	710.68'	2518.90'	16°09'56"
C8	591.39'	1959.86'	17°17'21"
C9	880.04'	5829.58'	08°38'58"
C10	385.39'	2406.48'	09°10'33"
C11	4.88'	1482.39'	00°11'19"
C12	27.56'	1382.39'	01°08'32"
C13	379.46'	1679.86'	12°56'32"

RADIAL LINE TABLE	
LINE	BEARING
R1	N86°56'52"E
R2	N25°15'10"E

400 0 400 800
SCALE OF FEET

LEGEND

- THE PROPERTY
- THE PROPERTY – PARCEL 1 (P-1)
- THE PROPERTY – PARCEL 2 (P-2)
- OTHER PROPERTY – PARCEL 3 (P-3)
- OTHER PROPERTY – PARCEL 4 (P-4)

APPENDIX A, MAP OF "THE PROPERTY" AND "THE OTHER PROPERTY" OF LHM DEV. RIH L.L.C.

LYING AND SITUATE IN THE SECTIONS 1, 2, & 12, TOWNSHIP 2 SOUTH, RANGE 4 EAST, SALT LAKE BASE AND MERIDIAN, SUMMIT COUNTY, UTAH

Boundary Consultants
Professional Land Surveyors
5554 West 2425 North,
Hooper, Utah, 84315
801-792-1569
dave@boundaryconsultants.biz

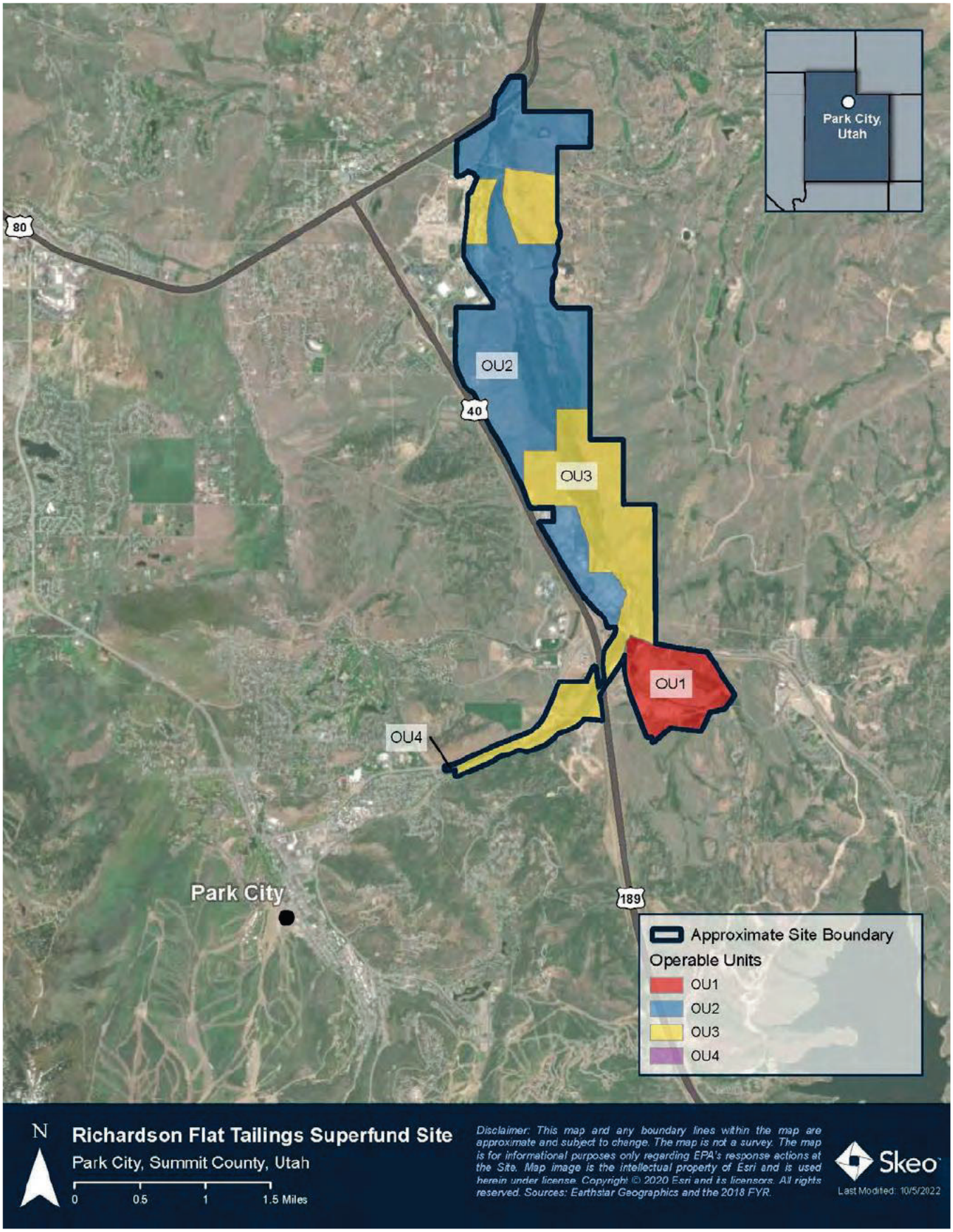
DATE: 01/14/25
SCALE: 1"=600'
1305037

DEH DEH MGD

1 / 1

Appendix B

Appendix B



Appendix C

Response Action Work Plan for Richardson Flat Operable Unit 1

Project No. 117-9165001
November 10, 2025

PRESENTED TO

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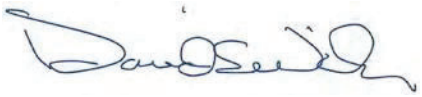

David S. Wilson, P.E., P.G. 11/10/2025
Principal Engineer & Project Manager
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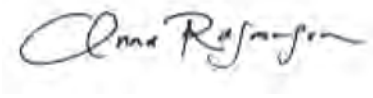

Anna Rasmuson, PhD, P.G. 11/10/2025
Geological Engineer
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LIST OF DRAWINGS

APPENDICES

ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
ARAR	Applicable or Relevant and Appropriate Requirements
BFPP	Bona Fide Prospective Purchaser
BMP	Best Management Practices
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CQA/QCP	Construction Quality Assurance Quality Control Plan
CWA	Clean Water Act
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESD	Explanation of Significant Differences
GPS	Global Positioning System
HASP	Health and Safety Plan
HMW	Historic Mine Waste
IC	Institutional Control
LHM	LHM DEV RIH LLC
mg/kg	Milligram per Kilogram
NPL	National Priorities List
O&M	Operations and Maintenance
OSHA	Occupational Health and Safety Administration
OU1	Operable Unit 1
OU2	Operable Unit 2
OU3	Operable Unit 3
OU4	Operable Unit 4
PDI	Pre-Design Investigation
POD	Point of Diversion
RAO	Remedial Action Objective
RI/FS	Remedial Investigation and Feasibility Study

Acronyms/Abbreviations	Definition
ROD	Record of Decision
RSL	Regional Screening Level
SWPPP	Storm Water Pollution Prevention Plan
UDEQ	Utah Department of Environmental Quality
UPCM	United Park City Mines
UPDES	Utah Pollution Discharge Elimination System
USGS	United States Geological Survey

1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) prepared this Response Action Work Plan (Work Plan) for LHM DEV RIH LLC (LHM), approved by US Environmental Protection Agency (EPA) and Utah Department of Environmental Quality (UDEQ) and attached as Appendix 1 to the Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser (Settlement) between LHM and EPA and UDEQ. This Work Plan has been prepared to outline remaining response actions to be completed by LHM for the Richardson Flat Operable Unit 1 (OU1) Site and other land as described herein.

LHM purchased certain real property located in Summit County, Utah, near Park City, more particularly described on the Drawings included with this Work Plan (Property). Tetra Tech prepared for LHM a Phase I Environmental Site Assessment (ESA, Tetra Tech, 2021a) and Environmental Management Plan (EMP, Tetra Tech, 2021b) on the Property, so LHM could claim liability protection as a bona fide prospective purchaser (BFPP) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

The Property is that portion of parcels SS-87 and SS-88 encompassed within OU1 and a small portion of Operable Unit 3 (OU3) and those areas of parcels SS-87 and SS-88 that are outside of OU1 or OU3 but are impacted by historic mine waste (HMW) identified further below. Some of the real property purchased by LHM and covered by the ESA are not within the Property identified by this Work Plan and Settlement. **Appendix A** of this Work Plan includes maps and boundary descriptions for the Property consistent with those incorporated into the Settlement for consistency and completeness.

This Work Plan identifies certain actions LHM, as a BFPP, intends to undertake at OU1 and for the HMW to maintain its BFPP status. Tetra Tech will serve as LHM's Engineer to support technical aspects of the Work Plan.

1.1 PURPOSE AND ORGANIZATION

Tetra Tech has prepared this Work Plan to identify actions for LHM to undertake at OU1 and for the HMW. This Work Plan has been organized into the following sections:

- **Section 1 – Introduction** presents background information on the Richardson Flat Site and the Property.
- **Section 2 – Scope of Work** describes in detail actions to be completed by LHM on OU1 and for certain HMW on the Property, and in less detail actions to be taken by EPA to place on OU1 mine waste from OU2 and OU3 (as defined in Section 1.2, Background).
- **Section 3 – Reporting** presents requirements for construction quality assurance, field records, progress reports, and the final report.
- **Section 4 – Operations and Maintenance** describes limited operation, monitoring, and maintenance (O&M) for the cap at the OU1 Repository.
- **Section 5 – Schedule** presents the estimated schedule for completing the actions described in this Work Plan.
- **Section 6 – References** lists documents referenced and relied upon to prepare this Work Plan.

1.2 BACKGROUND

The Richardson Flat Site (Site) comprises some 2,700 acres of land located northeast of Park City, Utah, along Silver Creek, a portion of which is shown on **Drawing C-100**. A 2009 Remedial Investigation and Feasibility Study (RI/FS) divided the Site into Operable Units (OUs) 1, 2, 3 and 4. The Property includes OU1 but not OUs 2, 3 and

4, except for a small portion of OU3 at the north corner of the Property. OU1 comprises approximately 160 acres of land and had been used as an impoundment for mine tailings since the early 1900s. The first recorded use of OU1 was in 1911 by predecessors of United Park City Mines (UPCM). An estimated total of seven million tons of tailings were placed at OU1 by UPCM, its predecessors, and its lessees through 1982. No further use of OU1 for mining activities has occurred since that time; however, OU1 has been used for disposal of mine waste from the Park City area and staging of clean soils for use as cap material on OU1. Environmental remediation has been performed on parts of OU1, and a parking lot was developed over part of OU1 in 2010.

In 1988, the Site was proposed for listing on, but was never listed on, the CERCLA National Priorities List (NPL). UPCM and EPA agreed to address OU1 as an "NPL equivalent" site requiring investigation and cleanup typical for an NPL site. UPCM and EPA entered into an Administrative Order on Consent (AOC) for remedial investigation/feasibility study in 2000. EPA issued a Record of Decision (ROD) for the Site in 2005, and EPA and UPCM entered into a consent decree specific to OU1 in 2007. Thereafter, EPA identified additional operable units at the Site. On October 17, 2022, a new Consent Decree between UPCM and the United States was entered by United States District Court Judge Bruce Jenkins (Consent Decree). This Consent Decree superseded all prior consent decrees and agreements entered between the United States and UPCM relating to the Property and the Site. The Consent Decree released UPCM from liability associated with the Site and other areas, and UPCM paid over $7 million to the United States for response costs.

OUs 1-4 are described by EPA as follows, with additional input by Tetra Tech describing OU1:

- OU1: Includes the approximately 100-acre impoundment and approximately 60 acres of surrounding land consisting of upland and wetland areas. This area is bounded to the north by Utah State Route 248 (UT-248), a historical garbage dump area to the west, and undeveloped land to the east and south. OU1 was divided into two sub-areas during work performed by UPCM: (i) "Area A" comprising the impoundment area north of a rail spur bisecting OU1; and (ii) "Area B" comprising a triangular shaped area of approximately 30 acres, located south of Area A, and bound by the former rail spur on the north and Richardson Flat Road on the south. Area B was remediated by UPCM and is currently used to store large stockpiles of imported soil for use as cover material and other backfill purposes.
- OU2: Includes 4.5 miles of the Lower Silver Creek Watershed and is generally bounded by Highway 40 to the south and I-80 to the north.
- OU3: Includes five distinct areas in the Lower Silver Creek Watershed:
    - Middle Reach: Extends from Silver Maple Claims at upstream end to Highway 40.
    - Floodplain Tailings Reach: Extends from Highway 40 northward to UT-248.
    - State Route 248 North Reach: Extends from UT-248 northward approximately 9,000 feet through the southern third of the Lower Silver Creek floodplain.
    - P.C. West: Area adjacent to the Snyderville Basin Water Reclamation Facility to the west.
    - P.C. East: Area to the north of Promontory Road adjacent to Pivotal Promontory, LLC.
- OU4: Includes the Prospector Drain east of the Prospector Square neighborhood south of UT-248.

This Work Plan is limited to activities at OU1 and certain HMW, both of which are located within the Property.

1.3 PREVIOUS SITE REMEDIATION

A description of completed remedial actions at OU1 are presented below, including a description of the selected remedy, remedial action objectives, and remedial actions completed by UPCM prior to purchase of the Property by LHM.

1.3.1 Selected Remedy

The major components of the selected remedy for OU1 as specified in the ROD include the following actions:

- Removal of tailings from critical areas south of the South Diversion Ditch (Area B) and placement of these tailings inside the impoundment (Area A).
- Capping remaining and consolidated tailings with a depth of at least 18 inches of soil.
- Removal of contaminated materials in the wetland west of the main embankment. This includes excavation of contaminated materials.
- Placement of twelve inches of clean gravel over the contaminated sediments in the South Diversion Ditch.
- Placement of mine waste from the Park City area within the impoundment.
- Fortification of the embankment to prevent catastrophic failure.
- Implementation of institutional controls to protect the soil cover, restrict land use to recreational purposes, and prevent groundwater use.
- Monitoring of surface water.

UPCM completed the consolidation of tailings, partial capping of the OU1 Repository, wetland and diversion ditch remediation, and fortification of the west embankment. However, some additional soil management and capping remains to be completed on OU1. Additional details are presented below.

1.3.2 Remedial Action Objectives

The following Remedial Action Objectives (RAOs) for OU1 are specified in the ROD:

- Reduce risks to wildlife receptors in the wetland area and South Diversion Ditch such that hazard indexes for lead are less than or equal to one.
- Ensure that recreational users, including children, continue to have no more than a 5% chance of exceeding a blood lead level of 10 micrograms (µg) per deciliter from exposure to lead in soils.
- Ensure that recreational users, including children, continue to have no more than 1×10^{-4} chance of contracting cancer from exposure to arsenic in soils.
- Eliminate the risk of catastrophic failure of the tailings impoundment.
- Ensure that surface water discharged from OU1 meets applicable Utah water quality standards.
- Eliminate the possibility of future groundwater use and withdrawal at OU1.
- Allow for a variety of future recreational uses.
- Allow for future disposal of mine tailings from the Park City area within the tailings impoundment until the remedy is complete.

- Minimize post-cleanup disturbance of tailings and contaminated soil at OU1; provide controls that ensure any necessary disturbance at OU1 follows prescribed methods.

1.3.3 Previous Remedial Activities

UPCM conducted cleanup of OU1 in the 1990s, including covering most of the tailings pile with clean, low-permeability soil, reseeding OU1, and improving the South Diversion Ditch.

UPCM conducted the following remedial action from 2007 to 2011 in accordance with the 2007 Consent Decree.

- Consolidated tailings from outside areas within the original tailings impoundment area of OU1 designated in the ROD as Area A (or OU1 Repository).
- Excavated tailings in critical areas in OU1 outside the impoundment area and moved them inside the OU1 Repository, including materials from the triangular-shaped area south of Area A, which is designated in the ROD as Area B.
- Installed a wedge buttress on OU1 to support the main west embankment.
- Removed affected sediments from the wetland area at OU1.
- Removed approximately 46,000 CY of contaminated material from the embankment wetland at OU1.
- Restored 12.7 acres of year-round wetlands and created or enhanced 10.4 acres of year-round wetlands and 25.7 acres of seasonal compensatory wetlands at OU1.

Details regarding these activities are documented in OU1 Task Completion Reports for Phases 1 through 5 completed by UPCM from 2008 to 2011. The O&M of OU1 has been performed by UPCM, and EPA has published Superfund Site five-year reviews in 2013, 2018, and 2023.

1.4 CURRENT CONDITIONS AT OU1 AND HMW AREAS

Current OU1 features include the approximately 100-acre main Area A where the OU1 Repository exists, the west embankment, the North and South Diversion Ditches, Area B from which impacted soils were previously removed and where clean soils are staged, and wetland areas as shown on **Drawing C-100**. Areas where tailings remain on OU1 are currently capped with 18 inches of clean soil, except the Remediation Task Areas F-2 and F-3 (F Areas) where six inches of interim cover are present. Thirty acres of OU1 at the southeast end of the OU1 Repository north of the South Diversion Ditch is leased by Park City Municipal Corporation (Park City). This area includes a parking lot and land for recreation uses.

Several large mounds of soil comprising approximately 500,000 cubic yards of material have been placed in Area B on OU1 and were determined to be clean during a Preliminary Design Investigation (PDI) conducted by Tetra Tech in late 2021 with the results presented in a Preliminary Design Investigation Report (Tetra Tech, 2022). Supplemental results from field analysis conducted by UPCM using a handheld X-ray fluorescence (XRF) instrument showed that the native soil surface below the stockpiles is clean (*i.e.*, less than 500 mg/kg) and the area is suitable for reuse.

Elevated soil lead concentrations (*i.e.*, greater than 500 mg/kg) had been identified at isolated locations in two limited Phase II Reports for parcels adjacent to OU1 within the Property, *i.e.,* the HMW (DK Environmental, 2020 and 2021). Tetra Tech collected and analyzed soil samples in these areas during a PDI using a handheld XRF instrument and laboratory analysis to refine the estimated quantities of HMW and confirm whether cover material and soil stockpiles in Areas A and B are clean and/or suitable for reuse. The locations of the HMW are shown on **Drawing C-100**. Preliminary volume estimates indicate that 10,700 cubic yards of HMW exceed the OU1

remediation target of 500 mg/kg, most of which will be excavated and placed within the OU1 Repository as part of LHM's interim remedial action as described in this Work Plan.

1.5 CONTINUED WORK AT OU1 AND HMW AREAS

The following work will be done by LHM at OU1 and on the HMW:

- LHM to excavate select HMW and place it in the OU1 Repository
- LHM to grade tailings in F-Areas to match surrounding grades
- LHM to place 18 inches of clean cover soil where required as determined by LHM as a final cover after placement of OU2 and OU3 materials by EPA as described below
- Coordinating with EPA during placement of the OU2 and OU3 wastes
- Construct stormwater management features.

Additional work will be performed by EPA in cooperation with LHM, consisting of EPA's expected movement of 200,000 to 300,000 cubic yards of HMW from OU2 and OU3 onto the OU1 Repository; the EPA has affirmed that it will relocate no more than 1 million cubic yards of HMW. LHM will allow EPA reasonable access to the OU1 Repository for placement and grading of the OU2 and OU3 mine waste performed by EPA in preparation for final capping by LHM of the combined materials placed within the F-areas.

It is anticipated that the southeast end of the OU1 Repository near the existing parking lot will not require further work, depending on the selected redevelopment strategy. This area already has undergone closure and is not proposed for disturbance. The northwest end of the Repository where the west embankment was reinforced by UPCM will not be disturbed to maintain the stabilized embankment and not increase the overburden load in this area.

During development at the Property by LHM and EPA's placement at the OU1 Repository of OU2 and OU3 mine waste, additional land disturbance will occur to the extent required as described in this Work Plan.

2.0 SCOPE OF WORK

This section addresses the work at OU1 and on the HMW that LHM and EPA will perform. The sequence of work to be performed will be coordinated by LHM and EPA to assure alignment of activities to achieve the ROD remedial action objectives.

2.1 WORK BY LHM

2.1.1 HMW Excavation and Placement

The work to be completed by LHM will include (i) excavating HMW to meet the land use standards described below and hauling and placing the HMW within the F Areas of the OU1 Repository; (ii) limited regrading of the F Areas to minimize dust generation until EPA relocates the OU2 and OU3 mine waste to OU1; (iii) coordinating with EPA during placement of the OU2 and OU3 wastes; (iv) installing a final 18-inch-thick cover over all exposed or disturbed wastes; and (v) constructing stormwater management features. These activities comprising the scope of work under the Work Plan are further described in the paragraphs that follow. Appendix B of this Work Plan presents the Construction Quality Assurance/Quality Control Plan (CQA/QCP) which serves as guidelines for performance of the work by LHM, the Engineer and Contractor. The CQA/QCP shall remain open for supplemental UDEQ and EPA review and EPA approval prior to the start of LHM's Work Plan activities. The CQA/QCP sections for excavation verification sampling and analysis of the HMW will require UDEQ and EPA review and EPA approval during 2026 to enable this work by LHM to be performed during 2026. UDEQ and EPA did not oversee characterization of the HMW or determine which soils will be removed. However, in accordance with this Work Plan, UDEQ and EPA will oversee and acknowledge the confirmation samples collected after excavation of the HMW. The CQA/QCP sections for installation of the final cover will be prepared for EPA and UDEQ review and EPA approval after EPA completes placement of the OU2/OU3 material at the OU1 Repository, in accordance with the schedule in Section 5.

LHM intends to use the land where the HMW is currently present for commercial development, recreational use, and/or open space. The extent of excavations and soil removal will target materials containing lead greater than the Final Cleanup Level in the ROD for lead at 500 mg/kg as further described in Section 2.1.1.2. If LHM chooses to consider the HMW areas for residential development, which is not currently planned by LHM, then the revised EPA Residential Regional Screening Level (RSL) requirements for lead will be required (EPA, January 17, 2024). EPA lowered the RSL for lead in soil at residential properties from 400 parts per million (ppm) to 200 ppm; and at residential properties with multiple sources of lead exposure, EPA will generally use 100 ppm as the screening level.

HMW Areas 4 through 7, 9 and 10 will be addressed under this Work Plan and the Settlement as agreed with EPA and UDEQ. HMW Area 8 was an asphalt pile that was field tested for lead using the XRF instrument, but no significant lead detections were observed. HMW Areas 1, 2 and 3 on the northwest side of OU1 near the former dump area will be addressed under a separate environmental program, as appropriate, with oversight from the UDEQ. The locations of the HMW areas are shown on Drawing C-100.

2.1.1.1 Preparation

Prior to commencing the excavations, LHM will identify an EPA certified laboratory, perform field marking of anticipated excavations, conduct utility clearances, and submit an appropriate list of ARARs for approval by EPA, with consultation from UDEQ. A kickoff meeting will be held between environmental field personnel (*i.e.*, Engineer), EPA, UDEQ, LHM, and the earthwork subcontractor.

The Blue Stakes of Utah Utility Notification Center (Blue Stakes) will be notified prior to commencing the work to identify buried utilities within and surrounding the footprint of the excavations. Impacted soil areas identified during the PDI will be marked using hand-held global positioning system (GPS) units. Temporary haul roads will be prepared to access areas without current road access.

2.1.1.2 Excavation Areas

Based on the PDI findings, approximately 10,700 cubic yards of HMW will be removed from the areas shown on **Drawing C-101**. Excavation volumes for individual areas are provided on the table below:

HMW Location	Description	Estimated Volume (cubic yards)	Estimated Depth (feet)
Area 4	Embankment South of Richardson Flat Road along US-40	300	1
Area 5-6	South of Richardson Flat Road	6,300	1
Area 7	North of Richardson Flat Road	3,500	1 to 9
Area 9	Tailings in former ditch south of Richardson Flat Road	500	4
Area 10	Isolated mound south of OU1	100	1

2.1.1.3 HMW Removal

Field personnel will use in-situ XRF readings and visual observations to determine materials to be excavated. XRF readings will be taken in-situ following the procedures described in the CQA/QCP once approved (**Appendix B** of this Work Plan**)**. Materials with XRF readings greater than 70% of the 500 mg/kg Final Cleanup Level (*i.e.*, action limit) will be removed to achieve conservative excavation boundaries prior to verification sampling for laboratory analysis. Soil removal will continue vertically and horizontally until XRF readings indicate that the material is less than 70% of the action limit. Field personnel may use flags or lead-free, spray paint to indicate the extent of the excavation as indicated by XRF readings.

Excavated soils will be excavated using a track hoe fitted with a flat blade to the approximate depths shown on **Drawing C-101**. The excavated material will be immediately hauled to the F Areas within the OU1 Repository and be consolidated with material in this area. Soils may be temporarily stockpiled (for no longer than 90 days) near excavations if a plastic tarp is placed beneath to prevent impacts to the adjacent surface soils, or over-excavation can be performed where stockpiles are placed within existing excavation footprints to demonstrate that the soil remaining in place after excavation is complete and meets the lead action limit. Surface water will be directed away from stockpiles to prevent erosion or deterioration of materials. Stockpiled materials will be covered when the work is not actively occurring (e.g., nights and weekends) to comply with site-wide monitoring requirements. Haul truck beds will be covered during transit to the OU1 Repository.

Excavations will be stepped back 2 feet for every 4 feet of depth in accordance with Occupational Safety and Health Administration (OSHA) regulations where applicable. Field personnel may screen soils from the excavation bucket if the excavation becomes unstable or unsafe to enter for verification sampling purposes.

2.1.1.4 Excavation Verification Sampling and Analysis

The CQA/QCP serves as guidelines for performance of the work by LHM, the Engineer and Contractor. The CQA/QCP shall remain open for supplemental UDEQ and EPA review and EPA approval prior to the start of LHM's Work Plan activities. Consistent with the CQA/QCP once approved, excavations will be determined to be clean using laboratory verification samples. Verification samples will be collected every 1,000 square feet in excavation areas less than 50,000 square feet and every 5,000 square feet in excavations larger than 50,000 square feet. The estimated number of samples per excavation area is provided on the table below:

HMW Location	Description	Excavation Area (feet^2)	Estimated Number of Samples
Area 4	Embankment South of Richardson Flat Road along US-40	6,900	7
Area 5-6	South of Richardson Flat Road	320,000	64
Area 7	North of Richardson Flat Road	83,000	17
Area 9	Tailings in former ditch south of Richardson Flat Road	3,400	4
Area 10	Isolated mound south of OU1	2,300	3

Soil samples will be collected using the procedures described in the CQA/QCP provided in **Appendix B**. Samples will be collected as 10-point aliquots collected from excavation floors and sidewalls. Sidewall samples will be collected every 300 linear feet in excavations deeper than 2.5 feet. Samples will be packaged and shipped for analysis by an EPA certified laboratory following the procedures described in the CQA/QCP. Sampling equipment will be decontaminated prior to and in between samples following procedures described in the CQA/QCP. Field duplicate samples will be collected at a rate of one per every 10 samples to evaluate laboratory precision; other CQA samples will be collected in accordance with the CQA/QCP (*e.g.,* equipment rinse blanks, field blanks, and matrix spike/matrix spike duplicate samples).

Excavations will be left open until laboratory results verify whether individual excavations meet the lead Final Cleanup Level of 500 mg/kg. Excavations that fail to meet this level will be excavated further and resampled to achieve the verification sample requirements at all locations.

2.1.1.5 Excavation Backfill

Excavations will be backfilled using clean soil that meets applicable land use restrictions. Clean soil may be sourced from the soil stockpiles in Area B after these materials have been verified via laboratory analysis to contain less than 500 mg/kg lead. Soil stockpile verification requirements are described in Section 2.1.3.

Backfill will be placed using 12-inch lifts. Material will be placed using power equipment or hand tools appropriate for the size area requiring backfill. Material will be compacted using earthmoving equipment and irregularities or depressions will be corrected by scarifying the material and adding or removing material, as required, until the surface meets the pre-excavation elevations and grades and generally matches the surrounding topography outside the excavation limits. Alternatively, shallow excavations may be graded to create 3 horizontal to 1 vertical (3H:1V) side slopes rather than backfilling if LHM plans to excavate these areas as part of its redevelopment plan. Similarly, backfilled areas may either be left unvegetated if LHM plans to develop these areas or will be

revegetated using a native seed mix. Final decisions on backfilling and revegetation will be made in cooperation with LHM based on the development plan for these areas.

2.1.2 Grading

Interim grading will be performed on the existing materials within the F Areas and on the HMW from the Property placed within the F Areas to match surrounding grades as conceptually depicted on **Drawing C-102**, and in accordance with ARARs in Section 2.3.1 to minimize dust emissions. The actual extent of grading, slope grades, and elevations may vary from this plan to best suit LHM's development plan. Based on the contours shown on **Drawing C-102**, the footprint area of this grading plan is approximately 42 acres. The existing mounds of tailings and HMW from the Property to be placed within the F Areas will require approximately 182,000 cubic yards of cut and 196,000 cubic yards of fill to achieve the contours shown on this conceptual drawing. This plan and the cut/fill quantities account for general grading of existing materials within the F Areas, plus room for the estimated 10,700 cubic yards from the HMW areas presented above, with a contingency for an additional 3,300 cubic yards of capacity if the actual HMW quantity increases during excavation.

Land disturbance will not occur outside of the designated contour changes and boundaries shown on **Drawing C-102**, unless revisions to this drawing are directed by LHM. The existing capped area of the OU1 Repository and park and ride lot to the east and south of the F Areas will not be disturbed during LHM's grading and capping activities. This eastern area of the OU1 Repository is being reserved for potential recreational uses.

2.1.3 Final Cover

Should EPA complete its excavation, placement, and grading of wastes from OU2 and OU3 at the OU1 Repository within six years of the Effective Date, LHM will place at its expense a final 18-inch-thick, low-permeability soil cover over the F Area and surrounding disturbed areas of the OU1 Repository following consolidation of all HMW from the Property and EPA's wastes from OU2 and OU3 as described herein. The existing 6-inch cover placed by UPCM will not be reused; instead, the existing cover material will be graded with the HMW from the Property and EPA's wastes from OU2 and OU3 to establish the approximate subgrade contours shown conceptually on **Drawing C-103**. However, the grading is intended by EPA and LHM to have flexibility in timing and sequencing and in locating, staging, configuring, contouring, sloping, adjusting, modifying, and constructing material piles for future recreational uses and stormwater management. The final cover will be placed on top of this area by LHM when grading of the imported wastes is completed by EPA in cooperation with LHM. The final cover will meet the requirements of the ROD to allow recreational use of the OU1 Repository after the work is completed.

Soils in the existing stockpiles in Area B will be used by LHM, a Transferree, or EPA as final cover material if lead concentrations are demonstrated to be less than the Final Cleanup Level of 500 mg/kg. There is estimated to be approximately 500,000 cubic yards of clean soil stockpiled in Area B, and it is estimated that approximately 131,000 cubic yards will be required to complete the final cover over the expanded F Areas as shown on **Drawing C-104**. All sample points collected during the PDI from Area B had lead concentrations less than 100 mg/kg indicating the soil is suitable for use as final cover materials and possibly other land development needs. However, EPA has requested that additional testing be performed to confirm that these soils are clean on a continuing basis (*i.e.*, satisfy the criteria for cover material and do not contain lead or other constituents above Final Cleanup Levels. Within six months of approval of the CQA/QCP, soil samples will be field screened with a handheld XRF instrument, and a five-point composite sample will be collected for every 5,000 cubic yards for verification analysis by a certified laboratory. Soil sampling procedures will be performed in accordance with the CQA/QCP once approved.

The final cover thickness will be measured to verify a minimum of 18 inches are placed. Final cover thickness data will be collected using a grid with 200-foot centers within the area to be graded and capped. The thickness will be measured using grade stakes, a hand coring tool or equivalent method. If cover thickness is less than 18-inches, additional cover placement and measurement will be performed.

The final cover will be placed to match the contours of the underlying subgrade at the approximate elevations and grades shown conceptually on **Drawing C-104**, depending on the actual amount of waste hauled to the OU1 Repository by EPA from OU2 and OU3 and input to the grading program by LHM in support of site development**.** The final cover will have side slopes with 5% grades on the outside and approximately 0.5% grade on the (interior) plateau to enable stormwater runoff in a controlled manner within the Repository. Grades will be confirmed by conventional survey techniques, and dust control will continue to be conducted during grading through visual inspections and application of water as needed to minimize dust generation.

The existing soil stockpiles in Area B were tested by Tetra Tech for gradation and permeability, and the results show that this soil satisfies the ROD requirement that the final cover material consist of low-permeability soil. The ROD further requires that the top of the final cover include a minimum of six inches of topsoil to support vegetation. Agronomic testing performed by Profile Products on behalf of Tetra Tech has demonstrated that the existing soil in Area B will perform well to develop and sustain vegetative cover with appropriate seed selection, fertilizer and mulching of the final cover consistent with local government requirements and industry standard practices for the area. LHM will leave in their current condition, provide access to, and make available for use as final cover the existing soil stockpiles in Area B until LHM, a Transferee, or EPA utilize them for the final cover.

Final grading and scarification will be performed to develop relatively smooth surfaces and promote seeding. Seeding will be conducted on the regraded area and disturbed areas using a seed mix of deep-rooted annual and perennial native grass and forb species. Stormwater management features including collection channels and detention basins will be designed and constructed at appropriate locations around the perimeter of the final cover. The locations for these features will depend on the final quantities of waste placed on the OU1 Repository by EPA from OU2 and OU3, established grades, and local stormwater design requirements and practices**.** Best Management Practices such as channel armoring and erosion controls will be implemented in accordance with ARARs listed in Section 2.3.1.

2.2 WORK BY EPA

The work to be completed by EPA will include placement of mine waste from OU2 and OU3 into the OU1 Repository, consistent with a CERCLA action memorandum to be issued by EPA. Excavation, hauling, placement and grading of OU2 and OU3 mine waste will be performed by EPA, pursuant to the EPA decision document. If EPA's excavation, placement, and grading of wastes from OU2 and OU3 at the OU1 Repository is not completed within six years of the Effective Date, EPA will install at its expense the final cap in accordance with the ROD. A conceptual grading plan for an estimated quantity of 250,000 cubic yards is shown on **Drawing C-103** *for planning purposes*. Once the EPA action memorandum is issued by EPA and is in effect, LHM will provide to EPA reasonable access to OU1 during this work. LHM and EPA and EPA's contractors will coordinate and work cooperatively regarding the placement of OU2 and OU3 mine waste within the OU1 Repository. The material placement and grading plan work are intended by EPA and LHM to have flexibility in timing and sequencing and in locating, staging, configuring, contouring, sloping, adjusting, modifying, and constructing material piles for future recreational uses and stormwater management.

2.3 ANCILLARY ACTIVITIES

In addition to the primary scopes of work to be performed by LHM and EPA described above, ancillary activities will be performed by LHM, as applicable, to support the work and preserve OU1 features during the work. These activities are addressed below and include compliance with ARARs, geotechnical investigations of the OU1 Repository, construction stormwater management, dust control, monitoring well protection, and site security and access control.

2.3.1 Applicable or Relevant and Appropriate Requirements

Implementation of the work within OU1 by LHM will be performed in accordance with CERCLA. Under CERCLA, on-site response actions are legally exempt from the requirement to obtain local, state or federal permits, as specified under CERCLA section 121(e)(1)(1986):

> "*No federal, state, or local permit shall be required for the portion of any removal or remedial action conducted entirely on site, where such remedial action is selected and carried out in compliance with this section*."

However, LHM will comply with the ARARs specified in the ROD per the tables below, as applicable.

Chemical Specific ARARs

Requirement	Citation	Description	Determination	Comment
Definitions and General Requirements of Utah Water Quality Act	UAC R317-1	Provides definitions and general requirements for waste discharge to waters of the State of Utah	Applicable	Substantive standards are applicable to point source discharges of contaminants into Silver Creek (if any) but permitting requirements would be preempted by operation of 42 USC 9621(e)(1).
Utah Surface Water Quality Standards	UAC R317-2-6 UAC R317-2-13 UAC R317-2-14	Establishes use designations for Silver Creek (as tributary to the Weber River): Class 1C - Protected for domestic purposes with prior treatment processes as required by Utah Div. of Drinking Water Class 2B – Protected for secondary contact recreation such as boating, wading. Class 3A – Protected for cold water species of games fish and aquatic life.	Applicable	Substantive standards are applicable to point source discharges of contaminants into Silver Creek (if any) but permitting requirements would be preempted by operation of 42 USC 9621(e)(1).

		Class 4 – Protected for agricultural uses and stock watering.		
Groundwater Quality	UAC R317-6	Establishing state groundwater quality standards	Applicable	Substantive standards are applicable to point source discharges of contaminants into Silver Creek (if any) but permitting requirements would be preempted by operation of 42 USC 9621(e)(1).
Solid and Hazardous Waste	UAC R315-2-4(b)(7)	Criteria for the Identification and Listing for Hazardous Waste	Not applicable	HMW is not classified as hazardous waste.
Solid and Hazardous Waste	UAC R311-211-3	Corrective Action Cleanup Standards Policy -UST and CERCLA sites	Not applicable	HMW is not classified as hazardous waste.
Utah Storm Water Rules	UAC R317-8-3.9	Establishes state storm water requirements	Applicable	Requires implementation of best management practices to address storm water management at the Site.

Location Specific ARARs

Requirement	Citation	Description	Determination	Comment
Protection of Wetlands	33 USC §1344	Prohibits discharge of dredged or fill materials into waters of the United States	Relevant and Applicable	Work will avoid impacts to jurisdictional wetlands.
Historic Sites, Buildings and Antiques Act	16 USC §§ 461-467	Requires protection of landmarks listed on National Registry	Applicable	Work will not adversely affect any listed landmarks.
National Historic Preservation	16 USC § 470	Requires protection of district, site, building, structure, or object eligible for inclusion in national register of historic places	Applicable	Work will not adversely affect any such district, site, building, structure, or object.

Archeological and Historic Preservation Act	16 USC § 469	Requires preservation of significant historical and archaeological data	Applicable	Work will not adversely affect archeological data or landmarks.
Fish and Wildlife Coordination Act	16 USC § 662	Requires that actions taken in areas that may affect streams and rivers be undertaken in a manner that protects fish and wildlife	Applicable	USFWS has been consulted and Work will not impact Silver Creek.
Endangered Species Act	16 USC § 1531	Requires protection of endangered and threatened species	Applicable	USFWS has been consulted regarding protection of endangered and threatened species.
Migratory Bird Treaty Act	16 USC § 703 *et seq*	Requires protection of migratory nongame birds	Applicable	USFWS has been consulted regarding protection of migratory nongame birds.
RCRA Subtitle D Solid Waste Requirement	UAC R315-303-3(4)	Establishes closure requirements for permitted solid waste landfills	Relevant/Appropriate	Closure requirements specified in the ROD are incorporated into this Work Plan.
Air Quality	UAC R307-205-6	Emission Standards	Applicable	Management practices will be implemented to limit fugitive emissions.

Action Specific ARARs

Requirement	Citation	Description	Determination	Comment
Abandoned wells	UAC R655-4	Standards for drilling and abandonment of wells	Not applicable	Work does not include installation or abandonment of wells.
Utah Storm Water Rules	UAC R317-8-3.9	Establishes state stormwater requirements	Applicable	Requires implementation of best management practices to address stormwater management at the Site.

Criteria for Classification of Solid Waste and Disposal Facilities and Practices	40 CFR Part 257.3	Establishes Criteria for use in determining which solid waste facilities and practices could adversely affect human health and the environment	Applicable	Requirements specified in the ROD are incorporated into this Work Plan.
Standards Applicable to Generators of Hazardous Waste	40 CFR Part 262	Establishes Standards for Generators of Hazardous Waste	Not applicable	Waste that is not Bevill-exempt is not anticipated as part of the Work.
General Facilities Standards	UAC R315-8-2	Location Standards	Not applicable	Waste that is not Bevill-exempt is not anticipated as part of the Work.
Closure and Post Closure	UAC R315-8-6	Closure Plan/Performance Standards	Not applicable	Waste that is not Bevill-exempt is not anticipated as part of the Work.

As a matter of convenience to assure compliance with stormwater protection during the work, LHM and the contractor will submit a Notice of Intent for coverage under the Utah General Construction Storm Water Pollutant Discharge Elimination System (UPDES) Permit in accordance with Utah Administrative Code R317-8-3.9 and Section 402 of the Clean Water Act (CWA) Section 404 permitting for discharge into waters of the United States as described in Section 2.3.3.

2.3.2 Geotechnical Investigations

Dames and Moore performed geotechnical investigations in 1974 and 1980 to provide recommendations for the OU1 Repository western embankment and impoundment dikes. The 1974 study included two borings in the embankment area. The borehole logs show fill material in the upper 22 feet, underlain by six feet of topsoil, underlain by 4 feet of silty sand and clay, underlain by bedrock. The fill material was described as containing wood, debris, and other waste materials. An additional eight feet of fill material obtained from the area west of the embankment consisting of clayey sand and gravel was added to the embankment in 1974.

A subsequent geotechnical evaluation was performed by Applied Geotechnical Engineering Consultants in 2001 to assess the increase in stability of the western embankment after installation of the wedge buttress. The study included profiles at two locations of the embankment based on descriptions of subsurface conditions from previous studies. The study concluded that the wedge buttress imparts an approximately 50 percent increase in overall stability.

The placement, grading, and eventual capping of materials by LHM and EPA in the OU1 Repository F-Areas, which is more than 500 feet from the western embankment, is not expected to affect the current stability of the OU1 Repository; however, EPA may choose to conduct additional geotechnical analysis to support the placement of the additional mine waste from OU2 and OU3 in OU1.

2.3.3 Construction Stormwater Management

Work activities within OU1 will be managed during disturbance to prevent migration of soil or mine waste into the diversion ditches, wetlands, and ponds. LHM will develop a Construction Storm Water Pollution Prevention Plan (SWPPP) to comply with the UPDES Construction General Permit requirements. The SWPPP will include construction-phase and post-closure best management practices (BMPs) as required by the UPDES permit. Erosion control measures will include re-vegetation of graded areas, use of mulch and/or tackifiers, and construction ingress/egress designed to preclude tracking of dust and mud from work areas onto roads.

Additional BMPs may include the following:

- Berms, wattles, and silt fencing as required to prevent the migration of materials from work areas.
- Sediment barriers in the South Diversion Ditch Pond and wetland to capture sediment and prevent downstream off-site migration These in-flow barriers may include combination of filter fabric drop structures and/or temporary retention structures.
- General grading to direct potential stormwater runoff to sediment basins and traps as needed.
- Hay or straw bale barriers placed in appropriate ephemeral channel features that drain from work areas. The hay bales will be placed downgradient from the silt fences or wattle barriers.

Stormwater runoff protection measures will remain in-place until revegetation efforts are complete. A supply of hay or straw bales and wattle material will be stored on OU1.

2.3.4 Dust Control

LHM and EPA will implement dust control measures during their respective earthwork activities, with LHM being responsible during its earthwork (or work by others) and EPA providing controls during movement and placement of OU2/OU3 soil at the OU1 Repository. Fugitive dust will be managed in all disturbed areas, haul roads, and soil stockpile areas. BMPs to control fugitive dust may include the following:

- All truck beds containing lead-impacted soil will be covered.
- Water or soil surfactant (i.e., tackifier) will be applied if visible dust is present. Application rates shall be high enough to suppress dust but low enough to prevent saturated conditions that could lead to contaminant migration via runoff or adhesion of mud on excavation/hauling equipment.
- Soil stockpiles will be covered if dust is observed to come from these piles.
- Vehicle speeds will not exceed 15 miles per hour.
- Rumble strips (or other dust/mud tracking measures) will be placed at site ingress/egress locations.

The work will be coordinated by LHM and EPA to minimize the time during which exposed soil surfaces may produce erosion by wind or water. Work may be halted temporarily until dust levels are suppressed if visible dust becomes a nuisance to adjacent property owners and reports of dust concerns are received by LHM, UDEQ, or EPA. Additional contingency measures may include, for any party doing work, that the party install quantitative dust monitoring equipment at select locations to represent upwind and downwind locations relative to the work if visible dust monitoring proves insufficient to manage dust control.

2.3.5 Monitoring Well Protection

One United States Geological Survey (USGS) monitoring well Point of Diversion (POD) is in Area B. This well will be protected during closure and development activities unless directed otherwise by the USGS or other agency representatives.

2.3.6 Security and Access

OU1 is currently fully fenced. The fence may be removed after final closure is complete to allow public access to recreational space upon agreement by EPA and UDEQ.

During Work Plan activities, workers entering OU1 will be notified of conditions and hazards. Signs will be posted informing the public of the response action work and alternate travel routes when required. All OU1 visitors will be required to sign into a visitor log when entering OU1.

Temporary barriers and security devices will be erected around the excavation areas of HWM within the Property, including warning signs, warning lights, and similar measures in areas where permanent OU1 fencing is removed for access to these areas for protection of workers and potential trespassers.

Per the Settlement, accessibility to OU1 will be maintained and granted at all reasonable times for EPA, UDEQ, and their representatives including contractors and subcontractors to perform the following activities:

- Implementing the Work and overseeing compliance with the Settlement
- Conducting investigations of contamination at OU1
- Assessing the need for, planning, implementing, or monitoring additional response actions at OU1
- Implementing a response action at the OU1 by persons performing under EPA oversight
- Determining whether OU1 is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Settlement or an EPA decision document for OU1
- Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions and any institutional controls at OU1.

Additionally, LHM will maintain reasonable access to OU1 for EPA and its subcontractors during their work while materials from OUs 2 and 3 are being hauled to OU1.

3.0 REPORTING

This section presents quality assurance, field records, progress reports, and final reporting requirements.

3.1 CONSTRUCTION QUALITY ASSURANCE

The CQA/QCP serves as guidelines for performance of the work by LHM, the Engineer and Contractor. The CQA/QCP shall remain open for supplemental UDEQ and EPA review and EPA approval prior to the start of LHM's Work Plan activities. The CQA/QCP sections for excavation verification sampling and analysis of the HMW will require UDEQ and EPA review and EPA approval during 2026 to enable this work by LHM to be performed during 2026. The CQA/QCP sections for installation of the final cover will be prepared for EPA and UDEQ review and EPA approval after EPA completes placement of the OU2/OU3 material at the OU1 Repository, in accordance with the schedule in Section 5.

EPA and UDEQ personnel and their authorized representatives will be allowed access to laboratories used by LHM per the Settlement. Split samples will be provided to EPA upon request and additional samples may be collected by EPA if deemed necessary.

3.2 FIELD RECORDS

This section provides the requirements and procedures to document field activities. Referenced forms are included in the CQA/CQP provided in Appendix B to this Work Plan.

Field Notes

Field notes should be recorded in general accordance with the CQA/QCP once approved; however, they will not necessarily be in bound logbooks. All investigation activities performed to support the Response Action will be documented in the appropriate field forms using waterproof, indelible ink. Entries will be detailed and descriptive so that a particular situation can be recalled without reliance solely on the field staff's memory. The following information will be included in field notes, as applicable:

- Weather, contractor personnel, and equipment (including a list of equipment downtime and subcontractors).
- Location and description of the work and estimated quantities performed that day.
- Condition of traffic control and roadway. Also record significant changes or problems with traffic control and devices.
- Significant communications with the contractor, especially those pertaining to work schedule, work methods, materials, or potential changes in costs.
- Communication and direction given to the contractor.
- References to significant letters, minutes of meetings and attendees, reports, photographs (Photograph Log), telephone conversations, conversations with OU1 visitors, etc.
- Disagreements with the contractor over work quality or performance, including rejected work or materials. List reasons for disagreement, and specific reasons why work and/or materials were rejected.

- Delays, difficulties, accidents, utility damages, and other unusual conditions. Describe factors or conditions that may hinder the contractor's operations and cause delays. Also include the time of suspending or resuming work and explanations.
- Comparison between scheduled work activities (from contractor's schedule) and actual work activities. Explain differences.
- Significant visits or communications with agencies, utilities, local officials, or property owners.
- Days or periods when no work was in progress, or no work was accomplished and reasons for work stoppage. All daily field log entries will be dated and signed.

If an incorrect entry is made in any type of data document, the incorrect data will be crossed out with a single line, the correct information entered, and the correction initialed and dated by the person making the correction. Like original entries, corrections will be made in indelible ink.

The Field Manager will review field notes for clarity and completeness in documenting daily activities and meeting investigation objectives.

Photograph Log

A photolog will be created to summarize daily activities at OU1. An example Photolog Form is provided in the CQA/QCP. Photographs will be taken using the horizontal landscape mode and the cardinal direction of the photo will be recorded.

Soil Sampling Log

Soil samples collected by the field staff will be documented in a Soil Sample Log. The Soil Sample Log will include sample identification numbers; soil types/textures; sample dates/times, depth, sampling equipment used; color, odor, and appearance of the samples; sample parameters; container descriptions; sample preservatives; and names of sampling personnel.

3.3 PROGRESS REPORTS

Progress reports will be completed monthly during LHM work activities at OU1 and will be submitted to EPA and UDEQ per the Settlement. Progress reports will describe all significant developments during the preceding period, including actions performed and any problems encountered, analytical data received, and developments anticipated during the next reporting period, including a schedule of the actions to be performed, anticipated problems, and planned resolution of past or anticipated problems.

Progress meetings may be held to review the work status upon request and agreement by LHM, EPA and UDEQ.

3.4 FINAL REPORT

A Final Report will be issued within 90 days after completion of the work performed by LHM described in this Work Plan. The final report will include the following in accordance with the Settlement:

1) Summarize the actions taken to comply with the Settlement
2) Conform to the requirements of Section 300.165 of the National Contingency Plan ("OSC Reports")
3) List the quantities and types of materials removed from OU1 or managed within OU1
4) Describe the removal and disposal options considered for those materials

5) Identify the ultimate destination(s) of those materials

6) Include the analytical results of all sampling and analyses performed

7) Include all relevant documentation generated during the work (*e.g.*, manifests, invoices, bills, contracts, and permits) and an estimate of the total costs incurred to complete the work.

The final report will be signed and certified by the Project Coordinator. A written Notice of Completion will be issued by EPA to LHM after EPA has reviewed the Final Report and, after consultation with UDEQ, determines that all work, other than continuing obligations, has been fully performed in accordance with the Settlement and this Work Plan.

If EPA, after consultation with UDEQ, determines that the work has not been completed in accordance with the Settlement and the Work Plan, EPA will notify LHM and provide a list of deficiencies. A modified Final Report will be submitted upon correction of the deficiencies, if any.

4.0 OPERATIONS AND MAINTENANCE

This section describes O&M requirements for the OU1 Repository. Per the Settlement, O&M will be performed to protect the effectiveness and integrity of the final cap over the OU1 Repository completed by LHM. O&M includes implementing institutional controls and land use restrictions. O&M will be financed and conducted by LHM until a public entity takes over responsibility for the recreational areas of OU1 within Area A. Area B and the area within OU1 south of Richardson Flat Road will become part of LHM's planned development as described in this Work Plan.

4.1 INSTITUTIONAL CONTROLS

The 2005 ROD specifies the following institutional controls (ICs) for OU1 to mitigate potential risks and ensure long-term efficacy of the selected remedy:

1. Groundwater use restrictions within the OU1 boundary.
    - Prohibit use of shallow groundwater and eliminate any significant alteration of the existing hydrogeologic system, such as mixing of aquifers.
    - ICs will be in the form of deed restrictions (*i.e.*, recorded environmental covenant).
2. Land use restrictions within the OU1 boundary.
    - Prohibit non-recreational uses and ensure the soil cover is maintained at the OU1 Repository.
    - ICs likely will be in the form of a recorded environmental covenant.

Within 90 days of the Effective Date, LHM will record an environmental covenant against OU1 that (1) restricts groundwater use; (2) prohibits non-recreational uses at the OU1 Repository; and (3) requires maintenance of the soil cover at the OU1 Repository. As described previously, LHM would like to consider with EPA alternative land uses other than outdoor recreation within portions of OU1 outside the OU1 Repository. This may include development of mixed land uses within Area B and the area within OU1 south of Richardson Flat Road. If such changes are proposed by LHM, then appropriate EPA protocols will be observed in cooperation with EPA and UDEQ to evaluate and document such changes (e.g., Explanation of Significant Differences under CERCLA).

4.2 OU1 REPOSITORY O&M

LHM or its successors and assigns will conduct O&M at the OU1 Repository. O&M activities will include the following responsibilities:

- Maintenance of the cover
- Maintenance of stormwater control features
- Maintenance and enforcement of institutional controls and access restrictions.

Inspections will be performed monthly until vegetation is established, and quarterly thereafter for the first year, semi-annually for the second year, and annually thereafter for five years after the final cover is completed. Inspections will be conducted in the early spring and/or early fall (depending on the frequency as listed above) to allow reseeding in the late spring and/or late fall if needed. An example inspection form is included in the CQA/QCP provided as Appendix B to this Work Plan.

Drainage and erosion will be inspected by visually observing cover material, the wedge buttress, drainage channels, berms, and rip-rap areas for damage. OU1 drainage features will be inspected after significant (*e.g.*, 25-year, 24-hour) storm events. Areas that have failed, washed out, or lack vegetative cover needed to prevent soil erosion will be repaired at the first opportunity and at the latest before the next inspection. Areas that have failed, washed out, or lack vegetative cover needed to prevent soil erosion will be repaired at the first opportunity and no later than 30 days after first discovering the condition. The cause of the failure will be determined if possible, and corrective steps will be taken to prevent additional erosion damage.

5.0 SCHEDULE

Because of its mountain climate and heavy rain and snowfall, the Park City area has short construction seasons that begin in late spring or early summer and end early in the fall. Likewise, overall development schedules will be delayed as Park City reviews and grants entitlement approvals and permits. Closure tasks to be performed as described herein are summarized in the table below with estimated lengths of times for completion of major tasks to be performed by LHM and EPA.

Task	Estimated Completion Time
LHM excavates and hauls HMW from the Property to OU1 Repository	2 months
LHM completes rough grading of F Area	1 month
EPA excavates, hauls, places, and grades OU2 and OU3 wastes at OU1 Repository	6 years
LHM installs final cover	2 months
LHM constructs stormwater management features	1 month
LHM prepares Project Closeout Report	2 months
LHM Performs O&M	Ongoing

1. See Paragraph 115 of Settlement

The EPA will commence its work in accordance with the forthcoming Engineering Evaluation/Cost Analysis (EE/CA) presenting EPA's recommendation for a remedy for OU2 and OU3. The timing for LHM's activities will be coordinated with EPA to minimize the time during which the OU1 Repository is open. EPA's work is expected to begin approximately one year from the Effective Date of the Settlement. EPA shall inform LHM in writing within 30 days of completion of its OU2 and OU3 work.

6.0 REFERENCES

Applied Geotechnical Engineering Consultants, Inc. *Stability Evaluation Richardson Flat Tailings Embankment*, October 4, 2001

DK Environmental, *Limited Phase II Environmental Assessment, Richardson Flat East, Park City Utah*, August 24, 2020

DK Environmental, Limited Phase II Environmental Assessment, Richardson Flat West, Park City Utah, August 27, 2021

Resource Management Consultants Inc (RMC), *Richardson Flat Task 1 Certificate of Completion and Approval*, June 18, 2008.

Resource Management Consultants Inc (RMC), *Phase 2 Task Completion Report for 2008 Construction Season Richardson Flat Tailings Site*, October 30, 2008.

Resource Management Consultants Inc (RMC), *Phase 3 Task Completion Report for 2009 Construction Season Richardson Flat Tailings Site*, November 17, 2009.

Resource Management Consultants Inc (RMC), *Phase 4 Task Completion Report for 2010 Construction Season Richardson Flat Tailings Site*, November 17, 2009.

Resource Management Consultants Inc (RMC), *Phase 5 Task Completion Report for 2011 Construction Season Richardson Flat Tailings Site*, November 1, 2011.

Resource Management Consultants Inc (RMC), *Restoration Plan and Environmental Assessment Richardson Flat Tailings Site, Park City, Summit Count, Utah*, October 26, 2012.

Tetra Tech, Inc., *Phase I Environmental Site Assessment Parcels SS-87, SS-88, and PP-28-A*. October 1, 2021.

Tetra Tech, Inc., *Environmental Management Plan for Richardson Flat Operable Unit 1 and Surrounding Lands*. November 17, 2021.

Tetra Tech, Inc., *Preliminary Design Investigation Report Richardson Flat Operable Unit 1 and Surrounding Lands Summit County, Utah*. November 17, 2022.

U.S. Environmental Protection Agency, *Environmental Information Quality Policy,* IT/IM Directive Policy No. CIO 2105.4, August 21, 2023.

U.S. Environmental Protection Agency, *Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures,* OSWER Directive No. 9360.4-01, April, 1990

U.S. Environmental Protection Agency, *Administrative Order on Consent for Remedial Investigation/Feasibility Study Richardson Flat Tailings Site*, September 28, 2000.

U.S. Environmental Protection Agency, *EPA Requirements for Quality Assurance Project Plans QA/R-5* EPA/240/B-01/003, March, 2001a.

U.S. Environmental Protection Agency, *EPA Requirements for Quality Management Plans,* EPA/240/B-01/002, March, 2001b.

U.S. Environmental Protection Agency, *EPA Guidance for Quality Assurance Project Plans* QA/G-5, EPA/240/R-02/009, December, 2002.

U.S. Environmental Protection Agency, *Richardson Flat Tailings Site Record of Decision*, July 8, 2005.

U.S. Environmental Protection Agency, *Parcels No. SS-88 Notice of Consent Decree,* November 19, 2007.

U.S. Environmental Protection Agency, *First Five-Year Review Report for the Richardson Flat Tailings Site*, February 7, 2013.

U.S. Environmental Protection Agency, *Second Five-Year Review Report for the Richardson Flat Tailings Site*, August 10, 2018.

U.S. Environmental Protection Agency, *Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, January 17, 2024.

DRAWINGS

LHM DEV RIH LLC
RICHARDSON FLAT TAILINGS SUPERFUND SITE
OPERABLE UNIT 1 CLOSURE PLAN

4750 West, 2100 South, Suite 400
Salt Lake City, Utah 84120
PHONE: 801-364-1064
www.tetratech.com
TETRA TECH

PROJECT LOCATION:
SUMMIT COUNTY, UTAH

CLIENT INFORMATION:
LHM DEV RIH LLC
9350 S 150 E Suite 900
Sandy, UT 84070

Tt PROJECT No.:
117-8905003

CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:
THE WORK CONSISTS OF TWO PHASES. PHASE 1 WORK CONSISTS OF EXCAVATION OF HISTORICAL MINE-RELATED, LEAD-IMPACTED SOIL FROM SELECT AREAS DESIGNATED AS AREAS 4 THROUGH 10 SHOWN AS RED HATCHED AREAS ON THIS DRAWING FOR PLACEMENT INTO THE OPERABLE UNIT 1 (OU1) BOUNDARY GENERALLY WITHIN THE TASK AREAS F-2 AND F-3. THE HISTORIC MINE WASTE AND EXISTING SOIL PILES IN TASK AREAS F-2 AND F-3 WILL BE GRADED AS SHOWN ON THESE DRAWINGS. PHASE 2, A SOIL COVER CONSISTING OF 18 INCHES OF CLEAN SOIL FROM THE AREA B STOCKPILES WILL BE PLACE OVER ALL GRADED SOILS TO COMPLETE CLOSURE OF OU1.

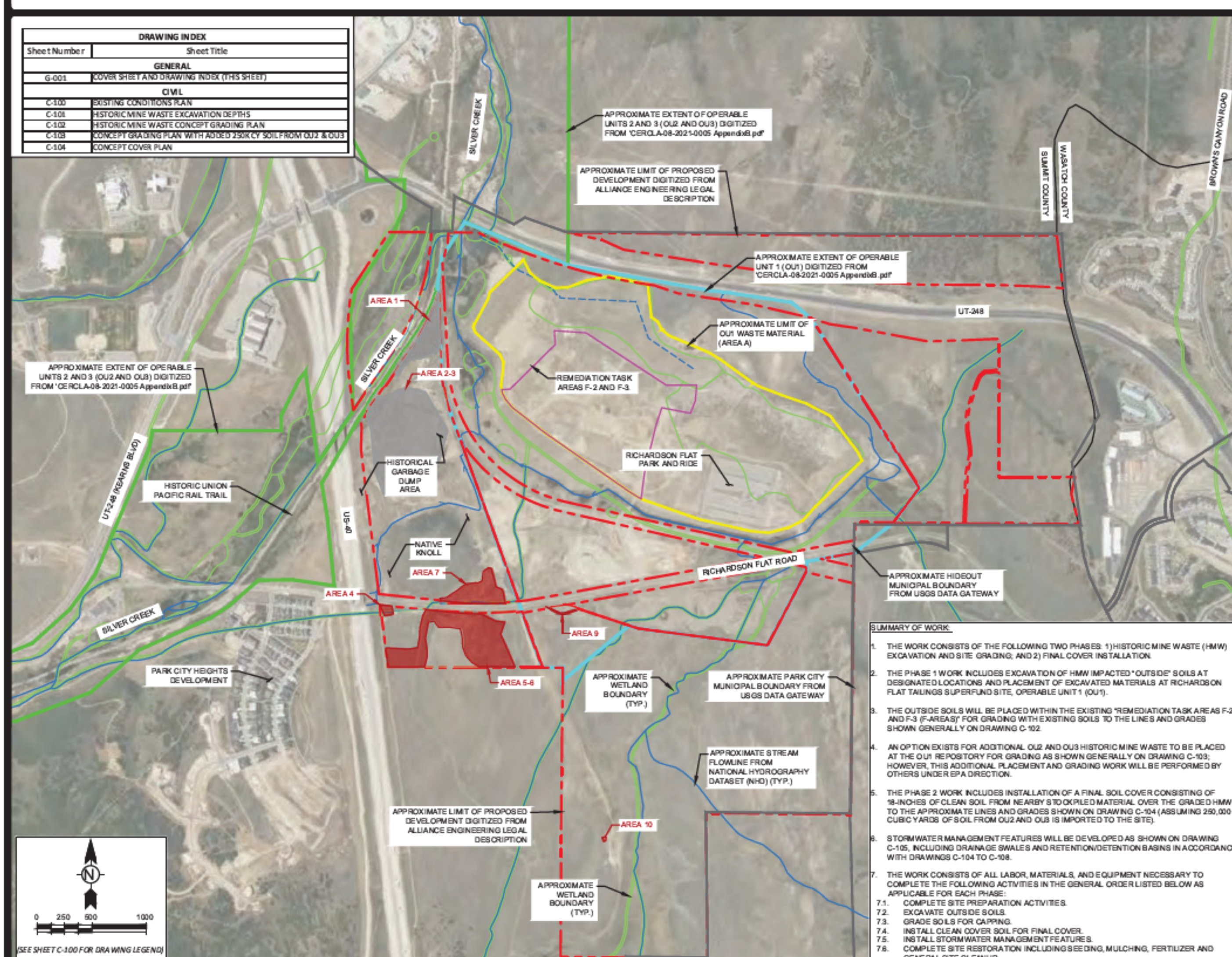
ISSUED:
REV A, 04/17/2025, ISSUED FOR AGENCY REVIEW

STAMP FOR PE SEAL WHEN READY FOR CONSTRUCTION

ISSUED FOR AGENCY REVIEW

DRAWING INDEX

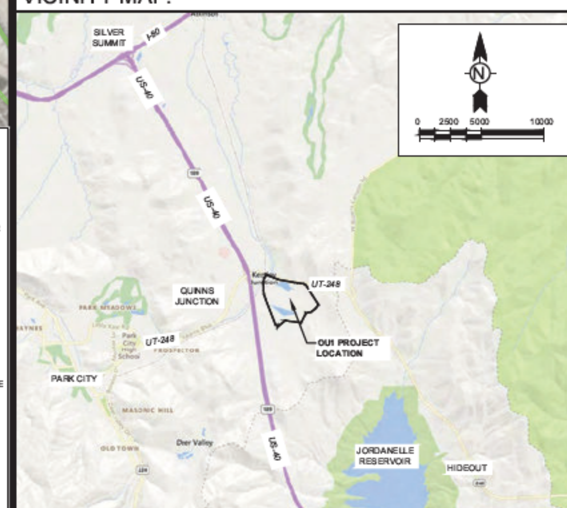
Sheet Number	Sheet Title
	GENERAL
G-001	COVER SHEET AND DRAWING INDEX (THIS SHEET)
	CIVIL
C-100	EXISTING CONDITIONS PLAN
C-101	HISTORIC MINE WASTE EXCAVATION DEPTHS
C-102	HISTORIC MINE WASTE CONCEPT GRADING PLAN
C-103	CONCEPT GRADING PLAN WITH ADDED 250K CY SOIL FROM OU2 & OU3
C-104	CONCEPT COVER PLAN



SUMMARY OF WORK:

1. THE WORK CONSISTS OF THE FOLLOWING TWO PHASES: 1) HISTORIC MINE WASTE (HMW) EXCAVATION AND SITE GRADING; AND 2) FINAL COVER INSTALLATION.
2. THE PHASE 1 WORK INCLUDES EXCAVATION OF HMW IMPACTED "OUTSIDE" SOILS AT DESIGNATED LOCATIONS AND PLACEMENT OF EXCAVATED MATERIALS AT RICHARDSON FLAT TAILINGS SUPERFUND SITE, OPERABLE UNIT 1 (OU1).
3. THE OUTSIDE SOILS WILL BE PLACED WITHIN THE EXISTING "REMEDIATION TASK AREAS F-2 AND F-3 (F-AREAS)" FOR GRADING WITH EXISTING SOILS TO THE LINES AND GRADES SHOWN GENERALLY ON DRAWING C-102.
4. AN OPTION EXISTS FOR ADDITIONAL OU2 AND OU3 HISTORIC MINE WASTE TO BE PLACED AT THE OU1 REPOSITORY FOR GRADING AS SHOWN GENERALLY ON DRAWING C-103; HOWEVER, THIS ADDITIONAL PLACEMENT AND GRADING WORK WILL BE PERFORMED BY OTHERS UNDER EPA DIRECTION.
5. THE PHASE 2 WORK INCLUDES INSTALLATION OF A FINAL SOIL COVER CONSISTING OF 18-INCHES OF CLEAN SOIL FROM NEARBY STOCKPILED MATERIAL OVER THE GRADED HMW TO THE APPROXIMATE LINES AND GRADES SHOWN ON DRAWING C-104 (ASSUMING 250,000 CUBIC YARDS OF SOIL FROM OU2 AND OU3 IS IMPORTED TO THE SITE).
6. STORMWATER MANAGEMENT FEATURES WILL BE DEVELOPED AS SHOWN ON DRAWING C-105, INCLUDING DRAINAGE SWALES AND RETENTION/DETENTION BASINS IN ACCORDANCE WITH DRAWINGS C-104 TO C-108.
7. THE WORK CONSISTS OF ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO COMPLETE THE FOLLOWING ACTIVITIES IN THE GENERAL ORDER LISTED BELOW AS APPLICABLE FOR EACH PHASE:
   - 7.1. COMPLETE SITE PREPARATION ACTIVITIES.
   - 7.2. EXCAVATE OUTSIDE SOILS.
   - 7.3. GRADE SOILS FOR CAPPING.
   - 7.4. INSTALL CLEAN COVER SOIL FOR FINAL COVER.
   - 7.5. INSTALL STORMWATER MANAGEMENT FEATURES.
   - 7.6. COMPLETE SITE RESTORATION INCLUDING SEEDING, MULCHING, FERTILIZER AND GENERAL SITE CLEANUP.

VICINITY MAP:



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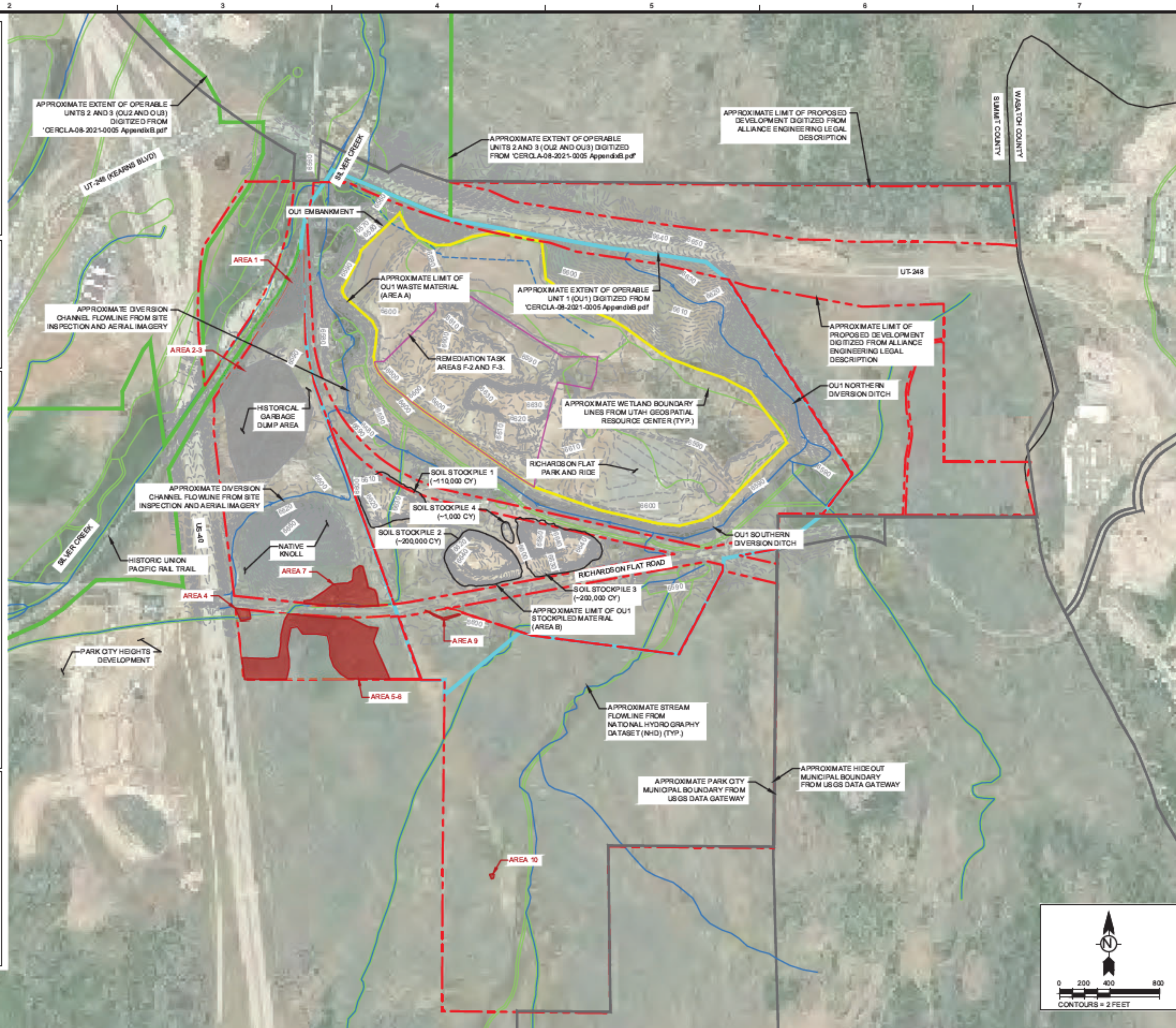

LEGEND

- LIMIT OF PROPOSED DEVELOPMENT NEAR OU1 (APPROXIMATE)
- MUNICIPAL BOUNDARY (APPROXIMATE)
- OPERABLE UNIT 1 (OU1) BOUNDARY (APPROXIMATE)
- OPERABLE UNITS 2 & 3 (OU2 & 3) BOUNDARY (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS INFERRED (APPROXIMATE)
- EXISTING WETLANDS (DOWNLOADED 4/20/21 FROM: HTTPS://GIS.UTAH.GOV/DATA/WATER/WETLANDS/)
- EXISTING DRAINAGE/CREEK FLOWLINE (NHD)
- HISTORIC/OUTDATED DRAINAGE/CREEK FLOWLINE (NHD)
- CONSTRUCTED DIVERSION CHANNEL FLOWLINE
- LIMITS OF REMEDIATION TASK AREAS F-2 AND F-3
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS (TO REMAIN)

NOTES:

1. ALL LINEWORK AND IMAGERY SHOWN HEREIN IS APPROXIMATE BUT CONSIDERED SUFFICIENTLY ACCURATE FOR STATED DESIGN AND CONSTRUCTION PURPOSES.
2. SOURCE OF EXISTING CONDITIONS TOPOGRAPHY IS AN AERIAL SURVEY BY BOUNDARY CONSULTANTS PERFORMED IN JUNE 2021.
3. APPROXIMATE EXCAVATION VOLUMES BASED ON 12" DEPTH OF CUT ACROSS ENTIRE IMPACT AREA AND LOCAL DEEPER AREAS BASED ON DK ENVIRONMENTAL TEST PIT DATA AS SHOWN ON EXCAVATION DRAWINGS.
4. AREA 8 WAS SAMPLED, DETERMINED TO BE CLEAN, AND WAS REMOVED FROM THE DESIGN.

SITE PREPARATION:

1. OBTAIN ALL REQUIRED PERMITS IN COOPERATOIN WITH ENGINEER/OWNER BEFORE BEGINNING CONSTRUCTION.
2. INSPECT AND IMPROVE ACCESS ROUTES TO EXCAVATION AREAS AND OU1 REPOSITORY TO ENABLE PERFORMANCE OF WORK; DO NOT CLOSE OR OBSTRUCT EXISTING ROADWAYS.
3. PROVIDE THE FOLLOWING ITEMS AS NECESSARY FOR EXECUTION OF THE WORK:
   - 3.1. TEMPORARY FIELD OFFICE INCLUDING ELECTRICAL SERVICE AND SANITARY FACILITIES.
   - 3.2. TEMPORARY FIRE PROTECTION, DUST CONTROL, EROSION AND SEDIMENT CONTROL, WATER CONTROL, NOISE CONTROL, AND OTHER NECESSARY TEMPORARY CONTROLS.
   - 3.3. TEMPORARY BARRIERS, BARRICADES, AND SIMILAR DEVICES AS NECESSARY FOR SAFETY AND PROTECTION OF CONSTRUCTION PERSONNEL AND ENGINEER/OWNER EMPLOYEES.
   - 3.4. TEMPORARY PROVISIONS FOR PROTECTION OF INSTALLED WORK.
4. COORDINATE WITH ENGINEER/OWNER TO IDENTIFY UTILITIES WITHIN THE WORK AREA; PROTECT FROM DAMAGE UTILITIES INDICATED TO REMAIN.
5. PROTECT BENCHMARKS, SURVEY CONTROL POINTS, EXISTING STRUCTURES AND FENCES AT THE SITE AND PERIPHERAL PAVING AND CURBS FROM DAMAGE RESULTING FROM HEAVY EQUIPMENT AND VEHICULAR TRAFFIC.
6. MAINTAIN AREAS FREE OF WASTE MATERIALS, DEBRIS, AND RUBBISH; MAINTAIN SITE IN CLEAN AND ORDERLY CONDITION THROUGH REGULAR HOUSEKEEPING.
7. COLLECT AND REMOVE WASTE MATERIALS, DEBRIS, AND RUBBISH FROM SITE NOT LESS THAN WEEKLY AND PROPERLY DISPOSE OF MATERIALS OFF-SITE.
8. INSTALL SOIL EROSION AND SEDIMENTATION CONTROLS (SESC) TO PROTECT SURFACE WATER AS SHOWN ON THE DRAWINGS AND INDICATED BELOW:
   - 8.1. PLAN AND EXECUTE CONSTRUCTION BY METHODS TO CONTROL SURFACE DRAINAGE FROM CUTS AND FILLS TO PREVENT EROSION AND SEDIMENTATION.
   - 8.2. MINIMIZE SURFACE AREA OF BARE SOIL EXPOSED AT ONE TIME.
   - 8.3. PROVIDE TEMPORARY MEASURES INCLUDING BERMS, DIKES, DRAINS, SILT FENCES, STRAW WATTLES AND OTHER DEVICES TO CONTROL WATER FLOW AND SOIL EROSION IN ACCORDANCE WITH THE DRAWINGS AND BEST MANAGEMENT PRACTICES.
   - 8.4. PERIODICALLY INSPECT EARTHWORK TO DETECT EVIDENCE OF EROSION AND SEDIMENTATION; PROMPTLY APPLY CORRECTIVE MEASURES AS NEEDED.

FIELD ENGINEERING:

1. ENGINEER WILL PROVIDE LAND SURVEYING TO SUPPORT THE WORK, INCLUDING SURVEY CONTROL AND FIELD MARKING OF EXCAVATION AREAS, AND PRE- AND POST-EXCAVATION SURVEYS FOR PURPOSES OF MATERIAL MEASUREMENT AND PAYMENT. CONTRACTOR MAY ALSO PERFORM SURVEYS TO CONFIRM WORK PERFORMED BY ENGINEER, BUT NO PAYMENT WILL BE MADE FOR CONTRACTOR-PERFORMED SURVEYS.
2. CONTROL DATUM FOR SURVEYS WILL BE ESTABLISHED BY ENGINEER AND WILL BE INDICATED ON DRAWINGS COMPLETED "ISSUED FOR CONSTRUCTION." ADVISE ENGINEER OF OBSERVED DISCREPANCIES OR CONFLICTS IN SURVEY DATA.
3. PROTECT SURVEY CONTROL POINTS PRIOR TO STARTING SITE WORK; PRESERVE PERMANENT REFERENCE POINTS DURING CONSTRUCTION.
4. PROMPTLY REPORT TO ENGINEER LOSS OR DESTRUCTION OF REFERENCE POINT OR RELOCATION REQUIRED BECAUSE OF CHANGES IN GRADES OR OTHER REASONS.
5. QUALITY ASSURANCE TESTING WILL BE PERFORMED BY THE ENGINEER FOR THE STRUCTURAL FILL PLACED TO CONSTRUCT THE NEW EMBANKMENT.

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ISSUED FOR AGENCY REVIEW

MARK	DATE	DESCRIPTION	BY
A	04/17/25	ISSUED FOR AGENCY REVIEW	DSW

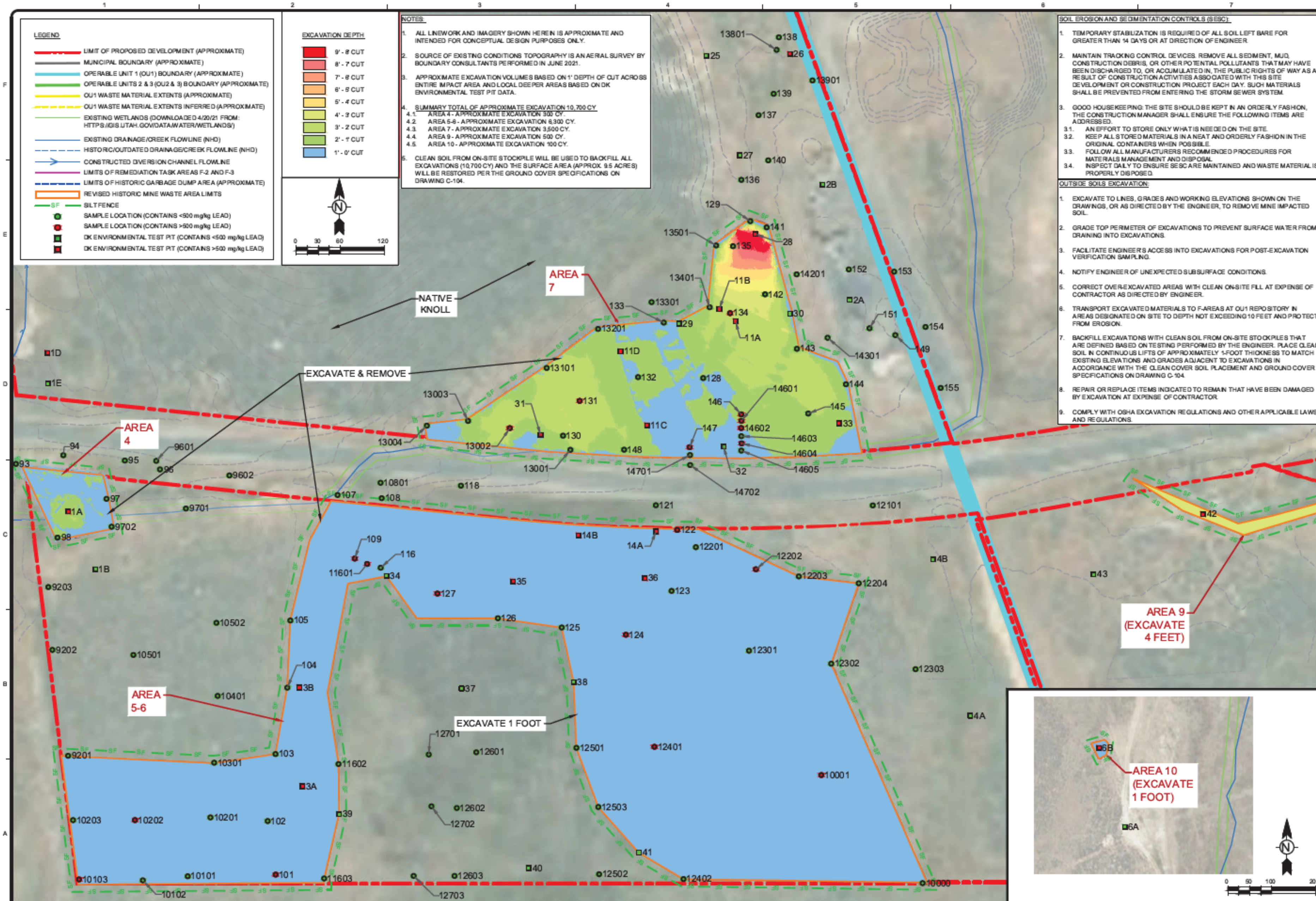
Client: LHM DEV RIH LLC
Proj. Loc. SUMMIT COUNTY, UTAH
RICHARDSON FLAT TAILINGS SUPERFUND SITE

OPERABLE UNIT 1 EXISTING CONDITIONS PLAN

Project No.:	117-8165001
Designed By:	DSW
Drawn By:	KRA
Checked By:	DSW

C-100

Docusign Envelope ID: 84A658F7-AB9A-4C7C-9E63-636EDCFDC6FF



LEGEND

- LIMIT OF PROPOSED DEVELOPMENT (APPROXIMATE)
- MUNICIPAL BOUNDARY (APPROXIMATE)
- OPERABLE UNIT 1 (OU1) BOUNDARY (APPROXIMATE)
- OPERABLE UNITS 2 & 3 (OU2 & 3) BOUNDARY (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS (APPROXIMATE)
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- EXISTING DRAINAGE/CREEK FLOWLINE (NHD)
- HISTORIC/OUTDATED DRAINAGE/CREEK FLOWLINE (NHD)
- CONSTRUCTED DIVERSION CHANNEL FLOWLINE
- LIMITS OF REMEDIATION TASK AREAS F-2 AND F-3
- LIMITS OF HISTORIC GARBAGE DUMP AREA (APPROXIMATE)
- REVISED HISTORIC MINE WASTE AREA LIMITS
- SF — SILT FENCE
- SAMPLE LOCATION (CONTAINS <500 mg/kg LEAD)
- SAMPLE LOCATION (CONTAINS >500 mg/kg LEAD)
- DK ENVIRONMENTAL TEST PIT (CONTAINS <500 mg/kg LEAD)
- DK ENVIRONMENTAL TEST PIT (CONTAINS >500 mg/kg LEAD)

EXCAVATION DEPTH

- 9' - 8' CUT
- 8' - 7' CUT
- 7' - 6' CUT
- 6' - 5' CUT
- 5' - 4' CUT
- 4' - 3' CUT
- 3' - 2' CUT
- 2' - 1' CUT
- 1' - 0' CUT

NOTES:

1. ALL LINEWORK AND IMAGERY SHOWN HEREIN IS APPROXIMATE AND INTENDED FOR CONCEPTUAL DESIGN PURPOSES ONLY.
2. SOURCE OF EXISTING CONDITIONS TOPOGRAPHY IS AN AERIAL SURVEY BY BOUNDARY CONSULTANTS PERFORMED IN JUNE 2021.
3. APPROXIMATE EXCAVATION VOLUMES BASED ON 1' DEPTH OF CUT ACROSS ENTIRE IMPACT AREA AND LOCAL DEEPER AREAS BASED ON DK ENVIRONMENTAL TEST PIT DATA.
4. SUMMARY TOTAL OF APPROXIMATE EXCAVATION 10,700 CY
   - 4.1. AREA 4 - APPROXIMATE EXCAVATION 300 CY.
   - 4.2. AREA 5-6 - APPROXIMATE EXCAVATION 6,300 CY.
   - 4.3. AREA 7 - APPROXIMATE EXCAVATION 3,500 CY.
   - 4.4. AREA 9 - APPROXIMATE EXCAVATION 500 CY.
   - 4.5. AREA 10 - APPROXIMATE EXCAVATION 100 CY.
5. CLEAN SOIL FROM ON-SITE STOCKPILE WILL BE USED TO BACKFILL ALL EXCAVATIONS (10,700 CY) AND THE SURFACE AREA (APPROX. 9.5 ACRES) WILL BE RESTORED PER THE GROUND COVER SPECIFICATIONS ON DRAWING C-104.

SOIL EROSION AND SEDIMENTATION CONTROLS (SESC):

1. TEMPORARY STABILIZATION IS REQUIRED OF ALL SOIL LEFT BARE FOR GREATER THAN 14 DAYS OR AT DIRECTION OF ENGINEER.
2. MAINTAIN TRACKING CONTROL DEVICES. REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT EACH DAY. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
3. GOOD HOUSEKEEPING: THE SITE SHOULD BE KEPT IN AN ORDERLY FASHION, THE CONSTRUCTION MANAGER SHALL ENSURE THE FOLLOWING ITEMS ARE ADDRESSED.
   - 3.1. AN EFFORT TO STORE ONLY WHAT IS NEEDED ON THE SITE.
   - 3.2. KEEP ALL STORED MATERIALS IN A NEAT AND ORDERLY FASHION IN THE ORIGINAL CONTAINERS WHEN POSSIBLE.
   - 3.3. FOLLOW ALL MANUFACTURERS RECOMMENDED PROCEDURES FOR MATERIALS MANAGEMENT AND DISPOSAL.
   - 3.4. INSPECT DAILY TO ENSURE SESC ARE MAINTAINED AND WASTE MATERIAL IS PROPERLY DISPOSED.

OUTSIDE SOILS EXCAVATION:

1. EXCAVATE TO LINES, GRADES AND WORKING ELEVATIONS SHOWN ON THE DRAWINGS, OR AS DIRECTED BY THE ENGINEER, TO REMOVE MINE IMPACTED SOIL.
2. GRADE TOP PERIMETER OF EXCAVATIONS TO PREVENT SURFACE WATER FROM DRAINING INTO EXCAVATIONS.
3. FACILITATE ENGINEER'S ACCESS INTO EXCAVATIONS FOR POST-EXCAVATION VERIFICATION SAMPLING.
4. NOTIFY ENGINEER OF UNEXPECTED SUBSURFACE CONDITIONS.
5. CORRECT OVER-EXCAVATED AREAS WITH CLEAN ON-SITE FILL AT EXPENSE OF CONTRACTOR AS DIRECTED BY ENGINEER.
6. TRANSPORT EXCAVATED MATERIALS TO F-AREAS AT OU1 REPOSITORY IN AREAS DESIGNATED ON SITE TO DEPTH NOT EXCEEDING 10 FEET AND PROTECT FROM EROSION.
7. BACKFILL EXCAVATIONS WITH CLEAN SOIL FROM ON-SITE STOCKPILES THAT ARE DEFINED BASED ON TESTING PERFORMED BY THE ENGINEER. PLACE CLEAN SOIL IN CONTINUOUS LIFTS OF APPROXIMATELY 1-FOOT THICKNESS TO MATCH EXISTING ELEVATIONS AND GRADES ADJACENT TO EXCAVATIONS IN ACCORDANCE WITH THE CLEAN COVER SOIL PLACEMENT AND GROUND COVER SPECIFICATIONS ON DRAWING C-104.
8. REPAIR OR REPLACE ITEMS INDICATED TO REMAIN THAT HAVE BEEN DAMAGED BY EXCAVATION AT EXPENSE OF CONTRACTOR.
9. COMPLY WITH OSHA EXCAVATION REGULATIONS AND OTHER APPLICABLE LAWS AND REGULATIONS.

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Salt Lake City, Utah
PHONE: 801-364-1064

ISSUED FOR AGENCY REVIEW

MARK	DATE	DESCRIPTION	BY
A	04/17/25	ISSUED FOR AGENCY REVIEW	DSW

Client: LHM DEV RIH LLC
Proj. Loc.: SUMMIT COUNTY, UTAH
RICHARDSON FLAT TAILINGS SUPERFUND SITE

HISTORIC MINE WASTE EXCAVATION DEPTHS

Project No.:	117-6165001
Designed By:	DSW
Drawn By:	KRA
Checked By:	DSW

C-101

LEGEND

- LIMIT OF PROPOSED DEVELOPMENT NEAR OU1 (APPROXIMATE)
- MUNICIPAL BOUNDARY (APPROXIMATE)
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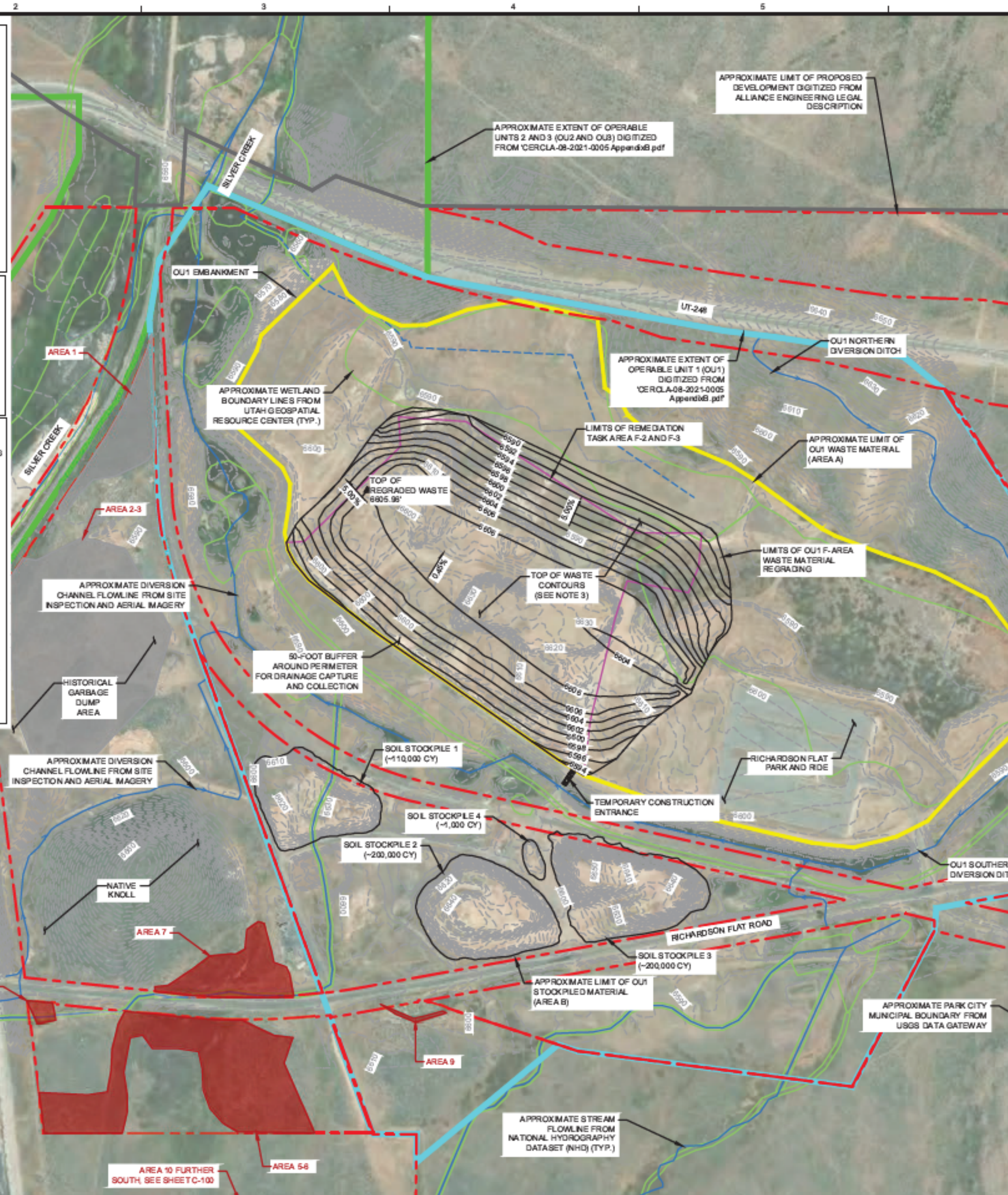
- OU1 WASTE MATERIAL EXTENTS INFERRED (APPROXIMATE)
- EXISTING WETLANDS (DOWNLOADED 4/20/21 FROM: HTTPS://GIS.UTAH.GOV/DATA/WATER/WETLANDS/)
- EXISTING DRAINAGE/CREEK FLOWLINE (NHD)
- HISTORIC/OUTDATED DRAINAGE/CREEK FLOWLINE (NHD)
- EXISTING CONSTRUCTED DIVERSION CHANNEL FLOWLINE
- LIMITS OF REMEDIATION TASK AREAS F-2 AND F-3
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS (TO REMAIN)

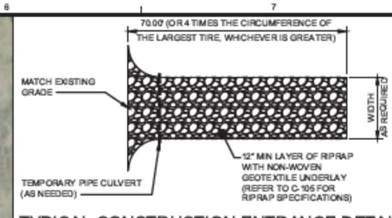
NOTES:

1. ALL LINEWORK AND IMAGERY SHOWN HEREIN IS APPROXIMATE BUT CONSIDERED SUFFICIENTLY ACCURATE FOR STATED DESIGN AND CONSTRUCTION PURPOSES.
2. SOURCE OF EXISTING CONDITIONS TOPOGRAPHY IS AN AERIAL SURVEY BY BOUNDARY CONSULTANTS PERFORMED IN JUNE 2021.
3. CONCEPTUAL OU1 REGRADING EARTHWORKS SUMMARY:
   - 3.1. ~42 ACRE FOOTPRINT
   - 3.2. WASTE MATERIAL CUT: ~182,000 CY
   - 3.3. WASTE MATERIAL FILL: ~196,000 CY
   - 3.4. ADDITIONAL IMPORTED FILL FROM IMPACTED AREAS: ~10,700 CY

HISTORIC MINE WASTE GRADING:

1. GRADE EXISTING SOILS AND OUTSIDE SOILS PLACED AT OU1 REPOSITORY (F AREAS) TO LINES AND GRADES SHOWN ON DRAWINGS. SPREAD MATERIAL USING APPROPRIATE EARTHMOVING EQUIPMENT FOR SIZE AREAS REQUIRING GRADING. PLACE AND SPREAD MATERIALS IN A UNIFORM LAYER(S) WITHOUT CAUSING SEGREGATION OF MATERIALS.
2. COMPACT MATERIALS USING EARTHMOVING EQUIPMENT LOADS, BUT NO SPECIFIC COMPACTION REQUIREMENTS APPLY TO THE IMPACTED MATERIALS. CORRECT IRREGULARITIES OR DEPRESSIONS THAT DEVELOP DURING PLACEMENT BY SCARIFYING THE MATERIAL AND ADDING OR REMOVING MATERIAL, AS REQUIRED, UNTIL THE SURFACE MEETS FINAL LINES AND GRADES ON DRAWINGS.
3. PROTECT GRADED AREAS FROM TRAFFIC, FREEZING, AND EROSION. KEEP FREE OF TRASH AND DEBRIS. REPAIR AND RE-ESTABLISH GRADES TO SPECIFIED TOLERANCES IF COMPLETED OR PARTIALLY COMPLETED SURFACES BECOME ERODED, RUTTED, SETTLED, OR IF THEY LOSE COMPACTION DUE TO SUBSEQUENT CONSTRUCTION OPERATIONS OR WEATHER CONDITIONS.
4. MOISTURE REQUIREMENTS SHALL BE MET USING THE FOLLOWING:
   - 4.1. DRY SUBGRADE: ADD WATER, THEN MIX TO MAKE MOISTURE CONTENT UNIFORM THROUGHOUT.
   - 4.2. WET SUBGRADE: AERATE MATERIAL BY BLADING, DISCING, HARROWING, OR OTHER METHODS, TO HASTEN DRYING PROCESS.
5. AFTER FILLING AND BACKFILLING OPERATIONS ARE COMPLETED, ALL AREAS ON THE SITE SHALL BE BROUGHT TO GRADE WITHIN A TOLERANCE OF +/- 0.1 FEET AT THE INDICATED ELEVATIONS, SLOPES AND CONTOURS.





TYPICAL CONSTRUCTION ENTRANCE DETAIL

SCALE: NTS

RIPRAP:

1. PROVIDE RIPRAP FOR STABILIZED CONSTRUCTION ENTRANCE (DRAWING C-102) AND STORMWATER CONVEYANCE CHANNEL CHECK DAMS (PER DETAIL 1 ON DRAWING C-108).
2. RIPRAP FOR STABILIZED CONSTRUCTION ENTRANCE:
   - 2.1. BROKEN STONE OR IRREGULAR-SHAPED ROCK.
   - 2.2. SOLID AND NONFRIABLE.
   - 2.3. TYPE: GRANITE, LIMESTONE OR APPROVED EQUAL SOURCED FROM LOCAL REGION.
   - 2.4. SIZE: MINIMUM: 1-INCH DIAMETER; MAXIMUM: 3-INCH DIAMETER.
   - 2.5. BASIS OF MEASUREMENT AND PAYMENT: INCLUDE WITH LUMP SUM PRICE FOR SESCS, INCLUDING SUPPLY AND PLACING OF RIPRAP.
3. RIPRAP FOR STORMWATER CONVEYANCE CHANNEL CHECK DAMS:
   - 3.1. BROKEN STONE OR IRREGULAR-SHAPED ROCK.
   - 3.2. SOLID AND NONFRIABLE.
   - 3.3. TYPE: GRANITE, LIMESTONE OR APPROVED EQUAL SOURCED FROM LOCAL REGION.
   - 3.4. SIZE: MINIMUM: 6-INCH DIAMETER; MAXIMUM: 12-INCH DIAMETER.
   - 3.5. BASIS OF MEASUREMENT AND PAYMENT: INCLUDE WITH UNIT PRICE TO CONSTRUCT DRAINAGE CHANNELS, INCLUDING SUPPLY AND PLACING OF RIPRAP.
4. RIPRAP PRODUCT DATA: SUBMIT MANUFACTURER INFORMATION REGARDING SIZE DISTRIBUTION AND TYPES OF ROCK FOR RIPRAP.
5. PREPARE SUBSTRATE AND PLACE GEOTEXTILE FABRIC OVER SUBSTRATE WHERE APPLICABLE AS SHOWN ON DRAWINGS.
6. DO NOT PLACE RIPRAP OVER FROZEN OR SPONGY SUBGRADE SURFACES.
7. AVERAGE INSTALLED THICKNESS: AS INDICATED ON DRAWINGS.

TETRA TECH
www.tetratech.com
4750 West 2100 South, Suit 400
Salt Lake City, Utah
PHONE: 801-364-1064

ISSUED FOR AGENCY REVIEW

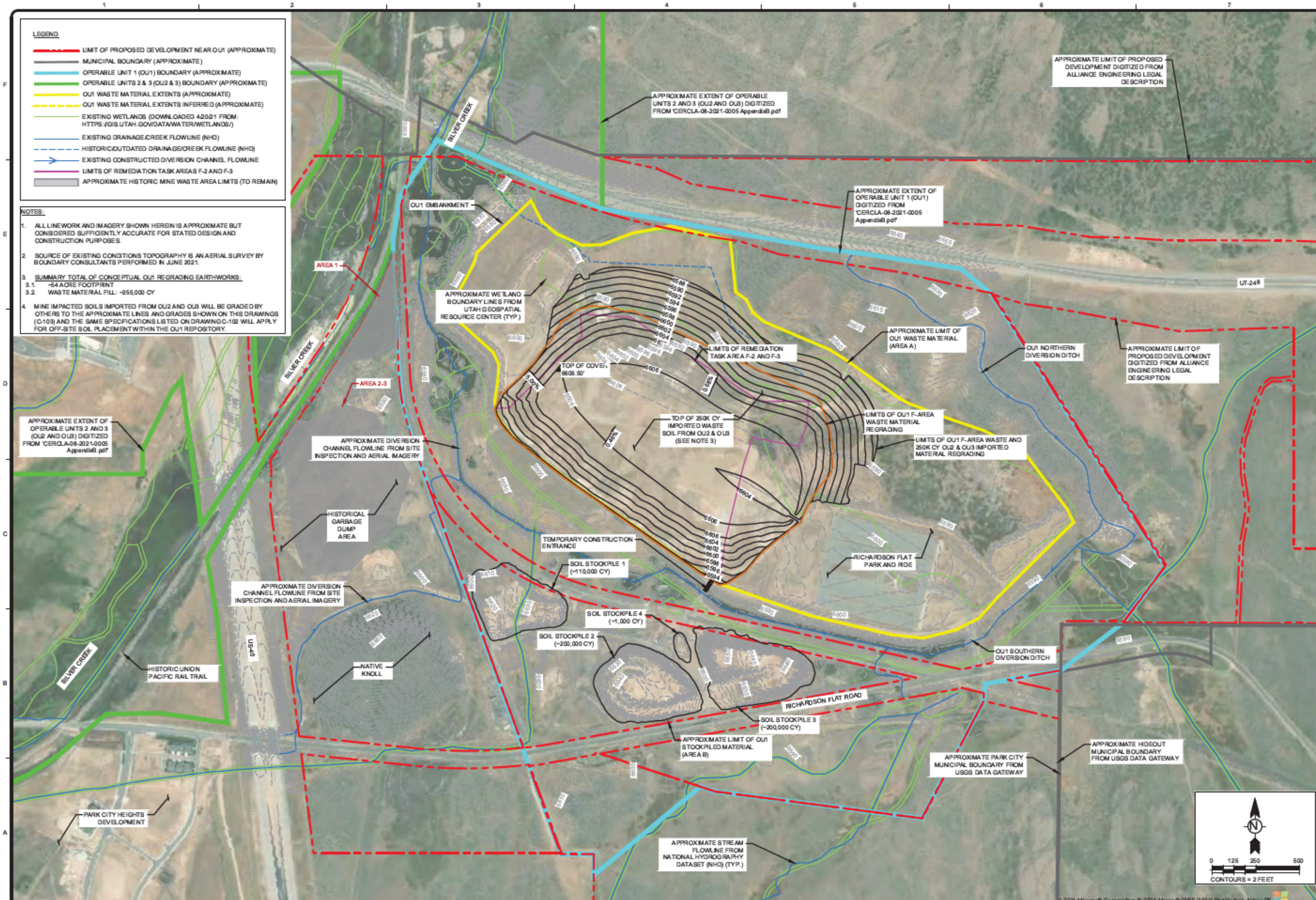
MARK	DATE	DESCRIPTION	BY
A	04/17/25	ISSUED FOR AGENCY REVIEW	DSW

Client: UHM DEV RH LLC
Proj. Loc.: SUMMIT COUNTY, UTAH
RICHARDSON FLAT TAILINGS SUPERFUND SITE

OPERABLE UNIT 1 HISTORIC MINE WASTE CONCEPT GRADING PLAN

Project No.:	117-9165001
Designed By:	DSW
Drawn By:	KRA
Checked By:	DSW

C-102



LEGEND

- LIMIT OF PROPOSED DEVELOPMENT NEAR OU1 (APPROXIMATE)
- MUNICIPAL BOUNDARY (APPROXIMATE)
- OPERABLE UNIT 1 (OU1) BOUNDARY (APPROXIMATE)
- OPERABLE UNITS 2 & 3 (OU2 & 3) BOUNDARY (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS INFERRED (APPROXIMATE)
- EXISTING WETLANDS (DOWNLOADED 4/20/21 FROM: HTTPS://GIS.UTAH.GOV/DATA/WATER/WETLANDS/)
- EXISTING DRAINAGE/CREEK FLOWLINE (NHD)
- HISTORIC/OUTDATED DRAINAGE/CREEK FLOWLINE (NHD)
- EXISTING CONSTRUCTED DIVERSION CHANNEL FLOWLINE
- LIMITS OF REMEDIATION TASK AREAS F-2 AND F-3
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS (TO REMAIN)

NOTES:

1. ALL LINEWORK AND IMAGERY SHOWN HEREIN IS APPROXIMATE BUT CONSIDERED SUFFICIENTLY ACCURATE FOR STATED DESIGN AND CONSTRUCTION PURPOSES.
2. SOURCE OF EXISTING CONDITIONS TOPOGRAPHY IS AN AERIAL SURVEY BY BOUNDARY CONSULTANTS PERFORMED IN JUNE 2021.
3. SUMMARY TOTAL OF CONCEPTUAL OU1 REGRADING EARTHWORKS:
   3.1. ~54 ACRE FOOTPRINT
   3.2. WASTE MATERIAL FILL: ~255,000 CY
4. MINE IMPACTED SOILS IMPORTED FROM OU2 AND OU3 WILL BE GRADED BY OTHERS TO THE APPROXIMATE LINES AND GRADES SHOWN ON THIS DRAWINGS (C-103) AND THE SAME SPECIFICATIONS LISTED ON DRAWING C-102 WILL APPLY FOR OFF-SITE SOIL PLACEMENT WITHIN THE OU1 REPOSITORY.

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ISSUED FOR AGENCY REVIEW

MARK	DATE	DESCRIPTION	BY
A	04/17/25	ISSUED FOR AGENCY REVIEW	DSW

Client: LHM DEV RH LLC
Proj. Loc. SUMMIT COUNTY, UTAH
RICHARDSON FLAT TAILINGS SUPERFUND SITE

OPERABLE UNIT 1
CONCEPT GRADING PLAN WITH ADDED 250K CY SOIL FROM OU2 & OU3

Project No.:	117-8165001
Designed By:	DSW
Drawn By:	KRA
Checked By:	DSW

C-103

LEGEND

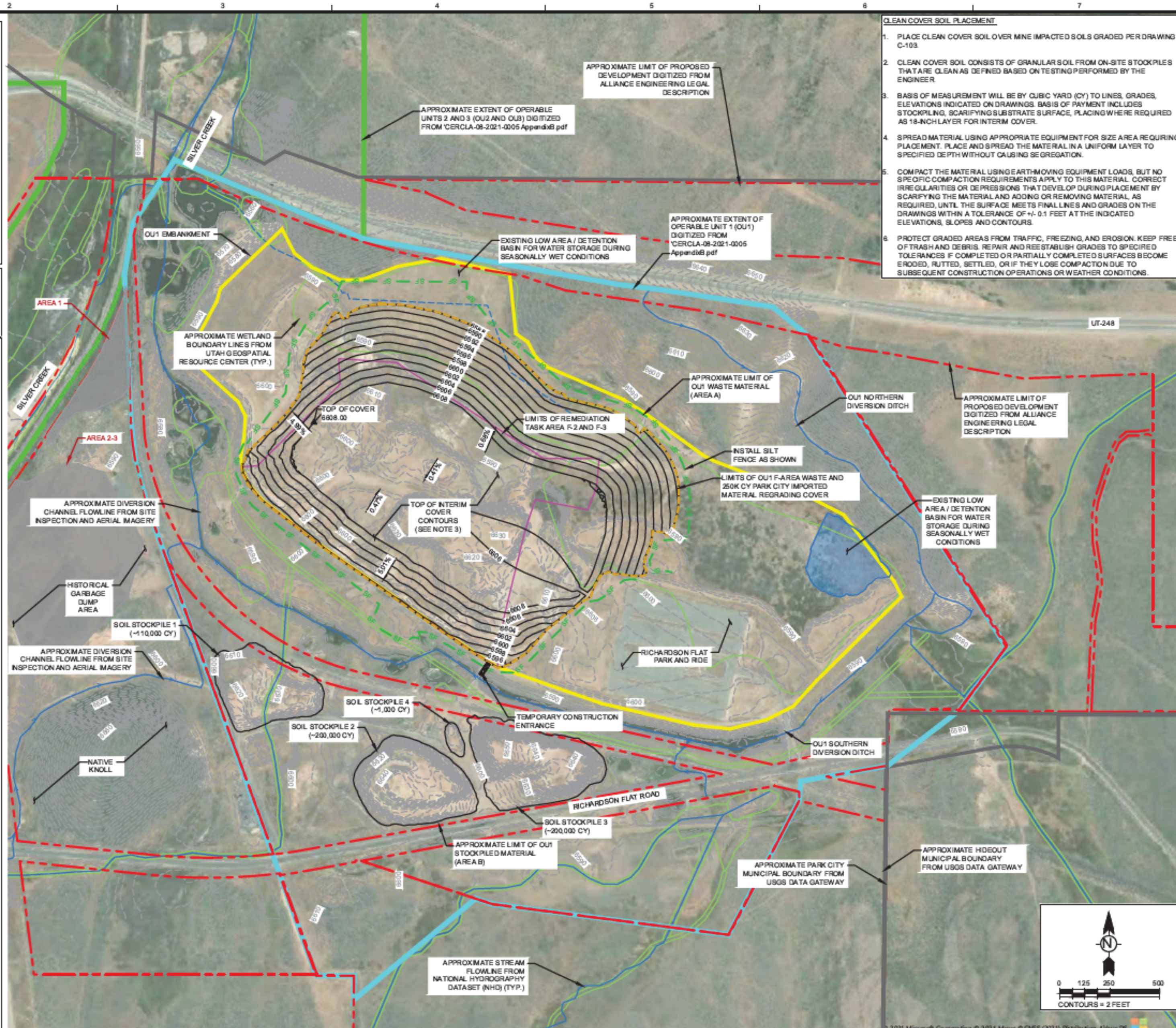
- LIMIT OF PROPOSED DEVELOPMENT NEAR OU1 (APPROXIMATE)
- MUNICIPAL BOUNDARY (APPROXIMATE)
- OPERABLE UNIT 1 (OU1) BOUNDARY (APPROXIMATE)
- OPERABLE UNITS 2 & 3 (OU2 & 3) BOUNDARY (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS (APPROXIMATE)
- OU1 WASTE MATERIAL EXTENTS INFERRED (APPROXIMATE)
- EXISTING WETLANDS (DOWNLOADED 4/20/21 FROM: HTTPS://GIS.UTAH.GOV/DATA/WATER/WETLANDS/)
- EXISTING DRAINAGE/CREEK FLOWLINE (NHD)
- HISTORIC/OUTDATED DRAINAGE/CREEK FLOWLINE (NHD)
- EXISTING CONSTRUCTED DIVERSION CHANNEL FLOWLINE
- LIMITS OF REMEDIATION TASK AREAS F-2 AND F-3
- APPROXIMATE HISTORIC MINE WASTE AREA LIMITS (TO REMAIN)
- SW — STRAW WATTLE
- SF — SILT FENCE

NOTES:

1. ALL LINEWORK AND IMAGERY SHOWN HEREIN IS APPROXIMATE BUT CONSIDERED SUFFICIENTLY ACCURATE FOR STATED DESIGN AND CONSTRUCTION PURPOSES.
2. SOURCE OF EXISTING CONDITIONS TOPOGRAPHY IS AN AERIAL SURVEY BY BOUNDARY CONSULTANTS PERFORMED IN JUNE 2021.

GROUND COVER

1. BASIS OF MEASUREMENT BY SQUARE YARD; BASIS OF PAYMENT INCLUDES SEEDING, FERTILIZER, MULCHING, WATERING AND MAINTENANCE TO SPECIFIED TIME LIMIT.
2. SUBMIT DATA FOR SEED MIX, FERTILIZER, AND MULCH, INCLUDE MANUFACTURER'S CERTIFICATE DEMONSTRATING COMPLIANCE WITH MATERIAL SPECIFICATIONS FOR GROUND COVER.
3. PROVIDE SEED MIXTURE IN CONTAINERS SHOWING PERCENTAGE OF SEED MIX, GERMINATION PERCENTAGE, INERT MATTER PERCENTAGE, WEED PERCENTAGE, YEAR OF PRODUCTION, NET WEIGHT, DATE OF PACKAGING, AND LOCATION OF PACKAGING.
4. DELIVER SEED MIXTURE IN SEALED CONTAINERS. SEED IN DAMAGED PACKAGING IS NOT ACCEPTABLE. DELIVER FERTILIZER IN WATERPROOF BAGS SHOWING WEIGHT, CHEMICAL ANALYSIS, AND NAME OF MANUFACTURER.
5. PROVIDE NATIVE GRASSES AND WILDFLOWERS AS FOLLOWS (OR EQUIVALENT APPROVED BY ENGINEER FOR SITE PROJECT LOCATION):
   5.1. MIXTURE: 77 PERCENT FESTUCA OVINA DURIUSCULA (HARD FESCUE) AND 23% WILDFLOWER SEEDS OF EQUAL PROPORTIONED QUANTITIES OF THE FOLLOWING, ASTER ALPINUS (ALPINE ASTER), CAMPANUAL CARPATICA 'JACQUELINE' (BLUEBELLS), COREOPSIS GRANDIFLORA 'SUNRAY' (DWARF COREOPSIS), ESCHSCHLZIA CALIFORNICA (CALIFORNIA POPPY), LINUM LEWISII (BLUE FLAX), PRIMULA (WHILE PRIMROSE), TAGETES (MARIGOLD), VIGUIERA MULTIFLORA (SHOWY GOLDEN EYE).
   5.2. PURITY OF ALL SEED TYPES: 90 PERCENT.
   5.3. GERMINATION OF ALL SEED TYPES: 90 PERCENT.
6. APPLY SEED CONCURRENTLY WITH FERTILIZER AND MULCH THROUGH HYDROSEEDING PROCESS. BECAUSE GROUND COVER WILL BE DEVELOPED OVER COMMENT CLEAN FILL (NOT TOPSOIL), PROFILE PRODUCTS LLC HYDRAULICALLY APPLIED BIOTIC EROSION CONTROL MATRIX (BECM) PROGANICS® DUAL™ WILL BE EMPLOYED TO COMPLETE SITE RESTORATION IN ALL DISTURBED AREAS RESULTING FROM THE WORK. UPON APPLICATION, PROGANICS DUAL FORMS AN INTIMATE BOND WITH THE SOIL SURFACE TO CREATE A CONTINUOUS, POROUS, ABSORBENT AND FLEXIBLE EROSION RESISTANT BLANKET THAT ALLOWS FOR RAPID GERMINATION AND ACCELERATED PLANT GROWTH. SUPPORTING PRODUCT DATA CAN BE PROVIDED BY THE ENGINEER OR MANUFACTURER PROFILE PRODUCTS.
7. SOIL TESTING WILL BE PERFORMED BY THE ENGINEER TO SUPPORT SOIL CONDITIONING AND FERTILIZER SPECIFICATION IN COOPRATION WITH THE PROGANICS® DUAL™ MANUFACTUER. EFFORTS WILL BE MADE TO COMPLETE TESTING PRIOR TO BIDDING SO MANUFACTURER PRICING IS ESTABLISHED TO SUPPORT CONTRACTOR BIDS WITHOUT CHANGES, DEPENDING ON WEATHER AND ACCESS TO COLLECT SOIL SAMPLES.
8. EXAMINE SUBSTRATES AND CONDITIONS WHERE MATERIALS WILL BE APPLIED. APPLY PRODUCTS TO STABLE SOIL SURFACE THAT HAVE BEEN CONSTRUCTED TO THE LINES AND GRADES SPECIFIED ON THE DRAWINGS. DO NOT PROCEED WITH INSTALLATION UNTIL SATISFACTORY CONDITIONS ARE ESTABLISHED.
9. PLACE GROUND COVER DURING NORMAL PLANTING SEASON FOR THE SPECIFIED VEGETATION TYPE. CORRELATE PLANTING TIME WITH SPECIFIED MAINTENANCE PERIODS AND GUARANTEE. EXAMINE GRADE, VERIFY ELEVATIONS, OBSERVE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED, AND NOTIFY ENGINEER OF UNSATISFACTORY CONDITIONS.
10. STRICTLY COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS. USE APPROVED HYDROSEEDING MACHINES WITH FAN-TYPE NOZZLE (50-DEGREE TIP). TO ACHIEVE OPTIMUM SOIL SURFACE COVERAGE, APPLY BECM FROM OPPOSING DIRECTIONS TO SOIL SURFACE. UNLESS APPROVED BY THE MANUFACTURER, NO CHEMICAL ADDITIVES EXCEPT FERTILIZER, SOIL NEUTRALIZERS AND BIOSTIMULANT MATERIALS SHOULD BE ADDED TO THIS PRODUCT.
11. APPLY PRODUCT AT MANUFACTURERS RECOMMENDED RATE OF 5,500 POUNDS PER ACRE BASED ON STANDARD SITE CONDITIONS ON ROUGH GRADED SLOPES. FOR ADDITIONAL DETAILS INCLUDING MIXING RATIOS/LOADING RATES FOR SPECIFIC MACHINE SIZES AND VISUAL KEYS FOR PROPER APPLICATION, PLEASE CONSULT PROFILE® APPLICATION GUIDE BECM.
12. ALWAYS FLUSH RESIDUAL SLURRY FROM HYDRAULIC SEEDING/MULCHING EQUIPMENT IMMEDIATELY FOLLOWING EACH APPLICATION, AT THE END OF EACH WORK PERIOD OR WHEN EQUIPMENT WILL BE LEFT UNATTENDED. COMPOUNDS CONTAINING RESIDUAL UREA, NITROGEN, PHOSPHORUS, POTASSIUM AND OTHER SUBSTANCES MAY FORM AND CAN BE HAZARDOUS TO HUMAN HEALTH AND EQUIPMENT. CLEAN SPILLS PROMPTLY AND ADVISE OWNER/ENGINEER IF AND WHERE SPILLS OCCUR.
13. WATER TO PREVENT VEGETATION AND SOIL FROM DRYING OUT (I.E., SOIL EXHIBITS EXCESSIVE VISUAL CRACKS) UNTIL VEGETATION IS ESTABLISHED AS DESCRIBED HEREIN. IMMEDIATELY RESEED AREAS SHOWING BARE SPOTS. REPAIR WASHOUTS OR GULLIES. CONTIGUOUS AREAS LARGER THAN 2.5' X 2.5' (6.25 SQUARE FEET) WHICH HAVE NOT GERMINATED, OR WHICH ARE WITHOUT AT LEAST 300 VIABLE SPROUTS SHALL BE CONSIDERED BARE AND SHALL BE RAKED, RESEEDED, RE-MULCHED, WATERED AND MAINTAINED AT NO ADDITIONAL COST TO THE OWNER UNTIL RESOLVED AND MATCHING ADJACENT ACCEPTABLE AREAS.
14. WARRANTY GROUND COVER DEVELOPMENT FOR ONE YEAR FROM TIME OF APPLICATION OR MAKE REPAIRS TO BARE AREAS AS NOTED ABOVE.



CLEAN COVER SOIL PLACEMENT

1. PLACE CLEAN COVER SOIL OVER MINE IMPACTED SOILS GRADED PER DRAWING C-103.
2. CLEAN COVER SOIL CONSISTS OF GRANULAR SOIL FROM ON-SITE STOCKPILES THAT ARE CLEAN AS DEFINED BASED ON TESTING PERFORMED BY THE ENGINEER.
3. BASIS OF MEASUREMENT WILL BE BY CUBIC YARD (CY) TO LINES, GRADES, ELEVATIONS INDICATED ON DRAWINGS. BASIS OF PAYMENT INCLUDES STOCKPILING, SCARIFYING SUBSTRATE SURFACE, PLACING WHERE REQUIRED AS 18-INCH LAYER FOR INTERIM COVER.
4. SPREAD MATERIAL USING APPROPRIATE EQUIPMENT FOR SIZE AREA REQUIRING PLACEMENT. PLACE AND SPREAD THE MATERIAL IN A UNIFORM LAYER TO SPECIFIED DEPTH WITHOUT CAUSING SEGREGATION.
5. COMPACT THE MATERIAL USING EARTHMOVING EQUIPMENT LOADS, BUT NO SPECIFIC COMPACTION REQUIREMENTS APPLY TO THIS MATERIAL. CORRECT IRREGULARITIES OR DEPRESSIONS THAT DEVELOP DURING PLACEMENT BY SCARIFYING THE MATERIAL AND ADDING OR REMOVING MATERIAL, AS REQUIRED, UNTIL THE SURFACE MEETS FINAL LINES AND GRADES ON THE DRAWINGS WITHIN A TOLERANCE OF +/- 0.1 FEET AT THE INDICATED ELEVATIONS, SLOPES AND CONTOURS.
6. PROTECT GRADED AREAS FROM TRAFFIC, FREEZING, AND EROSION. KEEP FREE OF TRASH AND DEBRIS. REPAIR AND REESTABLISH GRADES TO SPECIFIED TOLERANCES IF COMPLETED OR PARTIALLY COMPLETED SURFACES BECOME ERODED, RUTTED, SETTLED, OR IF THEY LOSE COMPACTION DUE TO SUBSEQUENT CONSTRUCTION OPERATIONS OR WEATHER CONDITIONS.

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Salt Lake City, Utah
PHONE: 801-364-1064

ISSUED FOR AGENCY REVIEW

MARK	DATE	DESCRIPTION	BY
A	04/17/25	ISSUED FOR AGENCY REVIEW	DSW

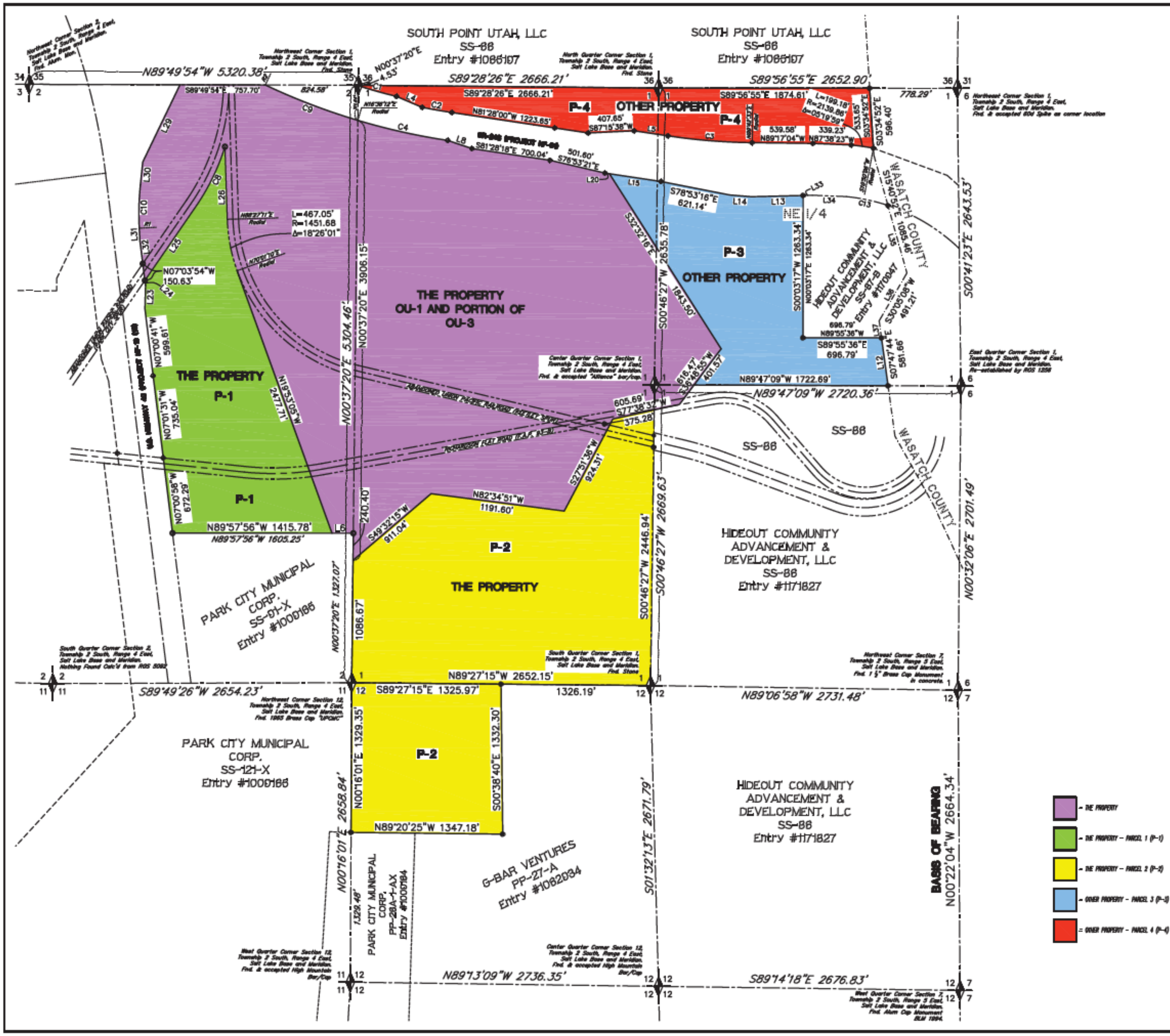
Client: LHM DEV RIH LLC
Proj. Loc.: SUMMIT COUNTY, UTAH
RICHARDSON FLAT TAILINGS SUPERFUND SITE

OPERABLE UNIT 1 CONCEPT COVER PLAN

Project No.:	117-9165001
Designed By:	DSW
Drawn By:	KRA
Checked By:	DSW

C-104

APPENDIX A – PROPERTY MAPS AND DESCRIPTIONS



LINE TABLE		
LINE	LENGTH	BEARING
L1	183.16'	S00°46'27"W
L2	446.53'	N79°45'59"E
L3	449.12'	N76°38'07"W
L4	246.50'	N66°56'17"W
L5	303.73'	N81°30'35"W
L6	189.47'	N89°57'56"W
L7	293.70'	S79°45'59"W
L8	227.74'	S71°25'55"E
L9	450.81'	S76°38'07"E
L10	401.57'	N36°48'55"E
L11	1843.40'	N32°32'16"W
L12	428.90'	S07°47'44"E
L13	459.21'	N88°37'03"E
L14	192.99'	S85°26'42"E
L15	464.02'	S81°27'28"E
L16	1843.40'	S32°32'16"E
L17	401.57'	S36°48'55"W
L18	165.65'	S00°46'27"W
L19	694.89'	S79°45'59"W
L20	39.17'	N81°27'28"W
L21	284.66'	N89°48'51"W
L22	249.55'	S76°38'07"E
L23	203.30'	N01°35'19"E
L24	47.94'	N07°17'03"W
L25	799.27'	N34°33'53"E
L26	645.10'	S01°51'07"E
L27	686.68'	S34°34'04"W
L28	91.04'	S03°49'24"W
L29	761.81'	N25°42'29"E
L30	203.62'	N05°49'23"E
L31	110.14'	N03°03'08"W
L32	206.41'	N07°00'58"W
L33	82.06'	N88°33'02"E
L34	300.62'	S87°43'00"E
L35	622.57'	S15°40'52"E
L36	491.21'	S30°05'08"W
L37	152.75'	S07°47'44"E

CURVE TABLE			
CURVE	LENGTH	RADIUS	DELTA
C1	354.00'	5534.58'	03°39'53"
C2	268.80'	5579.56'	02°45'37"
C3	751.34'	5502.89'	07°49'23"
C4	818.68'	5829.58'	08°02'47"
C5	682.47'	2418.90'	16°09'56"
C6	88.04'	889.28'	05°40'20"
C7	710.68'	2518.90'	16°09'56"
C8	591.39'	1959.86'	17°17'21"
C9	880.04'	5829.58'	08°38'58"
C10	385.39'	2406.48'	09°10'33"
C11	4.88'	1482.39'	00°11'19"
C12	27.56'	1382.39'	01°08'32"
C13	379.46'	1679.86'	12°56'32"

RADIAL LINE TABLE	
LINE	BEARING
R1	N86°56'52"E
R2	N25°15'10"E

400 0 400 800
SCALE OF FEET

LEGEND

- SECTION CORNER & SECTION LINE
- BOUNDARY LINE
- RIGHT OF WAY LINES
= ADJOINING PARCELS DEED LINES
- EDGE OF ROADWAY
- EXTANT FENCE LINES
- CL EXTANT OVERHEAD POWER LINES
- CENTER LINE GAS EASEMENT
= BOUNDARY PERIMETER OF EXCEPTION 21
- DIMENSION LINES

- SET #5 REBAR/CAP STAMPED "PLS 358548"
- FOUND EVIDENCE AS NOTED
- FOUND MONUMENT AS NOTED

ROS = RECORD OF SURVEY
Calc = CALCULATED
#/C = NUMBER #5 REBAR AND CAP

- THE PROPERTY
- THE PROPERTY – PARCEL 1 (P-1)
- THE PROPERTY – PARCEL 2 (P-2)
- OTHER PROPERTY – PARCEL 3 (P-3)
= OTHER PROPERTY – PARCEL 4 (P-4)

APPENDIX A, MAP OF "THE PROPERTY" AND "THE OTHER PROPERTY" OF LHM DEV. RIH L.L.C.

LYING AND SITUATE IN THE SECTIONS 1, 2, & 12, TOWNSHIP 2 SOUTH, RANGE 4 EAST, SALT LAKE BASE AND MERIDIAN, SUMMIT COUNTY, UTAH

Boundary Consultants
Professional Land Surveyors
5554 West 2425 North,
Hooper, Utah, 84315
801-792-1569
dave@boundaryconsultants.biz

PLOT DATE 01/14/25
SCALE 1"=600'
PROJECT NUMBER 1305037

DEH | DEH | MGD

1 / 1

“THE PROPERTY OU1”

A parcel of land lying and situate in the East Half of Section 2 and all of Section 1, Township 3 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the Summit County aluminum cap monument marking the Northwest Corner of said Section 2, thence South 89°49’54” East 1338.78 feet coincident with the north line of said Section 2 to the True Point of Beginning;
Thence South 89°49’54” East 757.70 feet to a point on the southerly right of way of SR-248; Thence the following six (6) courses coincident with said right of way, 1) Easterly 880.04 feet along the arc of a 5829.58 foot radius curve to the left (center bears North 25°15’10” East) through a central angle of 08°38’58” to a point on the east line of said Section 2; 2) Continuing Easterly 818.68 feet along the arc of a 5829.58 foot curve to the left (center bears North 16°36’12” East) through a central angle of 08°02’47” to a right of way monument; 3) South 71°25’55” East 227.74 feet to a right of way monument; 4) South 81°28’18” East 700.04 feet to a right of way monument; 5) South 76°53’21” East 501.60 feet to a right of way monument; 6) South 81°27’28” East 39.17 feet; Thence departing said right of way South 32°32’16” East 1843.50 feet; Thence South 36°48’55” West 616.47 feet; Thence South 77°38’32” West 605.69 feet; Thence South 27°51’36” West 924.31 feet; Thence North 82°34’51” West 1191.60 feet; Thence South 49°32’15” West 911.04 feet to a point on the east line of said Section 2; Thence North 00°37’20” East 240.40 feet coincident with said east section line; Thence North 89°57’56” West 189.47 feet; Thence North 19°53’05” West 2477.71 feet; Thence Northerly 467.05 feet along the arc of a 1451.68 foot radius curve to the right (center bears North 70°01’10” East) through a central angle of 18°26’01” to a point of tangency; Thence North 01°51’07” West 645.10 feet; Thence Southwesterly 591.39 feet along the arc of a 1959.86 feet (center bears North 72°43’28” West) through a central angle of 17°17’21” to a point of tangency; Thence South 34°33’53” West 799.27 feet to a point on the east right of way of U.S. Highway 40; Thence the following six (6) course coincident with said east right of way, 1) North 07°03’54” West 150.63 feet; 2) North 07°00’58” West 206.41 feet; 3) North 03°03’08” West 110.14 feet to a point of curvature; 4) Northerly 385.39 feet along the arc of a 2406.48 foot radius curve to the right (center bears North 86°56’52” East) through a central angle of 09°10’33” to a point of tangency; 5) North 05°49’23” East 203.62 feet; 6) North 25°42’29” East 761.81 feet to the point of beginning.

Contains 283.30 acres, ±12,340,422 sq. ft.

"THE PROPERTY" – PARCEL 1

A parcel of land lying and situate in the East Half of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49'54" East 5230.38 feet, measured, between the Summit County Surveyor's aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the 1965 brass cap monument marking the Southeast Corner of said Section 2, thence North 00°37'20" East 1327.07 feet coincident with the east line of said Section 2; Thence North 89°57'56" West 189.47 feet to the True Point of Beginning:
Thence North 89°57'56" West 1415.78 feet to a point on the easterly right of way of U.S. Highway 40; Thence the following five (5) courses coincident with said easterly right of way, 1) North 07°00'58" West 672.29 feet to a right of way monument; 2) North 07°01'31" West 735.04 feet to a right of way monument; 3) North 07°00'41" West 599.61 feet; 4) North 01°35'19" East 203.30 feet; 5) North 07°17'03" West 47.94 feet; Thence departing said right of way North 34°33'53" East 799.27 feet to a point of curvature; Thence Northerly 591.39 feet along the arc of a 1959.86 foot radius curve to the left (center bears North 55°26'07" West) through a central angle of 17°17'21"; Thence South 01°51'07" East 645.10 feet to a point of curvature; Thence Southerly 467.05 feet along the arc of a 1451.68 foot radius curve to the left (center bears North 88°27'11" East) through a central angle of 18°26'01"; Thence South 19°53'05" East 2477.71 feet to the point of beginning.

Contains 68.63 acres, ±2,989,635 sq. ft.

“THE PROPERTY” – PARCEL 2

A parcel of land lying and situate in the Southwest Quarter of Section 1, and the Northwest Quarter of Section 12, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Beginning at the 1965 brass cap monument marking the Southeast Corner of said Section 2, thence North 00°37’20” East 1086.67 feet coincident with the east line of said Section 2; Thence North 49°32’15” East 911.04 feet; Thence South 82°34’51” East 1191.60 feet; Thence North 27°51’36” East 924.31 feet; Thence North 77°38’32” East 375.28 feet to a point on the Center Quarter Section line of said Section 2; Thence South 00°46’27” West 2446.94 feet coincident with said Center Quarter Section line to the G.L.O. Stone Monument marking the South Quarter Corner thereof; Thence North 89°27’15” West 1326.19 feet coincident with said south section line to a number five rebar and cap stamped “PLS 356548”; Thence South 00°38’40” East 1332.30 feet to a number five rebar and cap stamped “PLS 356548”; Thence North 89°20’25” West 1347.18 feet to a point on the west line of the Northwest Quarter of said Section 12 and a number five rebar and cap stamped “PLS 356548”; Thence North 00°16’01” East 1329.35 feet coincident with the west line of said Northwest Quarter Section to the point of beginning.

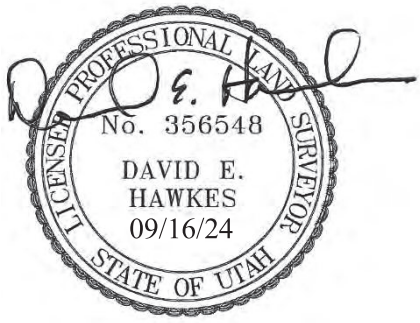
Contains 145.46 acres, ±6,336,243 sq. ft.

“OTHER PROPERTY” – PARCEL 3

A parcel of land lying and situate in the North Half of Section 1, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49’54” East 5230.38 feet, measured, between the Summit County Surveyor’s aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Commencing at the number five rebar and cap stamped “ALLIANCE” which is marking the Center Quarter Section corner of said Section 1, thence South 89°47’09” East 350.84 feet coincident with the Center Quarter Section line of said Section 1 to the True Point of Beginning;
Thence North 36°48’55” East 401.57 feet; Thence North 32°32’16” West 1843.50 feet to a point on the southerly right of way of SR-248; Thence the following the following four (4) courses coincident with said right of way, 1) South 81°27’28” East 464.02 feet to a right of way monument; 2) South 78°53’16” East 621.14 feet; 3) South 85°26’42” East 192.99 feet; 4) North 88°37’03” East 459.21 feet to a number five rebar and cap stamped “PLS 356548”; Thence South 00°03’17” West 1263.34 feet to a number five rebar and cap stamped “PLS 356548”; Thence South 89°55’36” East 696.79 feet to a number five rebar and cap stamped “PLS 356548 and a point on the Summit-Wasatch County Line; Thence South 07°47’44” East 428.90 feet coincident with said County Line to a number five rebar and cap stamped “PLS 356548” to a point on the Center Quarter Section Line and a number five rebar and cap stamped “PLS 356548”; Thence North 89°47’09” West 1722.69 feet coincident with said Quater Section Line to the point of beginning.

Contains 51.89 acre, ±2,260,176 sq. ft.

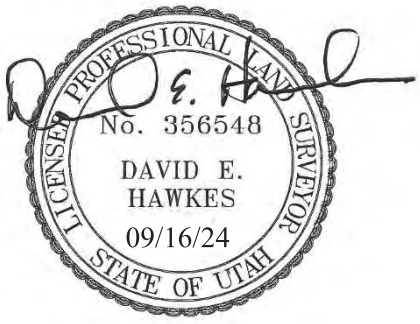


"OTHER PROPERTY" – PARCEL 4

A parcel of land lying and situate in the North Half of Section 1, Township 2 South, Range 4 East, Salt Lake Base and Meridian, Summit County, Utah. Basis of Bearing for Subject Parcel being South 89°49'54" East 5230.38 feet, measured, between the Summit County Surveyor's aluminum cap monument marking the Northwest Corner of said Section 2 and the G.L.O. stone monument marking the Northeast Corner of Section 2, Township 2 South, Range 4 East, Salt Lake Base and Meridian.

Beginning at the G.L.O. stone monument marking the Northwest Corner of Section 1, Township 2 South, Range 4 East, Salt lake Base and Meridian, thence South 89°28'26" East 2666.21 feet coincident with the north line of said Northwest Quarter Section to the North Quarter Corner thereof; Thence South 89°56'55" East 1874.61 feet coincident with the north line of the Northeast Quarter of said Section 1 to a point on the Summit-Wasatch County Line and a number five rebar and cap stamped "PLS 356548"; Thence South 03°34'52" East 533.65 feet coincident with said County Line to a right of way monument; Thence the following ten (10) courses course coincident with the northerly right of way line of SR-248, 1) Westerly 199.18 feet along the arc of a 2139.86 foot radius curve to the left (center bears South 10°50'06" West) through a central angle of 05°19'59" to a point of tangency and a right of way monument; 2) North 87°38'23" West 339.23 feet to a right of way monument; 3) North 89°17'04" West 539.58 feet to a point of curvature and a right of way monument; 4) Westerly 751.35 feet along the arc of a 5502.89 foot radius curve to the right (center bears North 00°42'33" East) through a central angle of 07°49'23" to a point of tangency and a right of way monument; 5) North 81°30'35" West 303.73 feet to a right of way monument; 6) South 87°15'38" West 407.65 feet to a right of way monument; 7) North 81°28'00" West 1223.65 feet to a point of curvature and a right of way monument; 8) Westerly 268.80 feet along the arc of a 5579.56 foot radius curve to the right (center bears North 08°31'57" East) through a central angle of 02°45'37" to a right of way monument; 9) North 66°56'17" West 246.50 feet to a point on the arc of a 5534.58 foot radius curve; 10) Westerly 354.00 feet along the arc of said 5534.58 foot radius curve to the right (center bears North 13°44'15" East) through a central angle of 03°39'53" to a point on the west line of the Northwest Quarter of said Section 1; Thence departing said right of way North 00°37'20" East 4.53 feet coincident with said Quarter Section Line to the point of beginning.

Contains 37.81 acres, ±1,647,003 sq. ft.



APPENDIX B – DRAFT CONSTRUCTION QUALITY ASSURANCE / QUALITY CONTROL PLAN

Draft Construction Quality Assurance / Quality Control Plan
Richardson Flat Operable Unit 1

Project No. 117-9165001
July 11, 2025

PREPARED FOR

LHM DEV RIH LLC
C/O Bradley R. Cahoon
Dentons Durham Jones Pinegar P.C.
111 S. Main St., Ste 2400
Salt Lake City, UT 84111
(801) 297-1270
brad.cahoon@dentons.com

PRESENTED BY

Tetra Tech, Inc.
4750 West 2100 South
Suite 400
Salt Lake City, UT 84120
(801)-736-7451
Fax (801) 364-2021
tetratech.com

Revision 1: July 11, 2025

PROJECT CERTIFICATION

I hereby certify that I am responsible for the services described in this document and for the preparation of this Construction Quality Assurance/ Quality Control Plan (CQA/QCP). The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, and comply with all applicable federal, state, and local statutes, regulations, and ordinances.

TETRA TECH, INC.

_____
David S. Wilson, PE, PG
Project Manager/Engineer of Record

_____
Anna Rasmuson, PhD, PG, PE
Geological Engineer

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ATTACHMENTS

LIST OF ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CCR	Construction Completion Report
CFR	*Code of Federal Regulations*
CQA	Construction Quality Assurance
CQA/QC	Construction Quality Assurance/Quality Control
CQA/QCP	Construction Quality Assurance/Quality Control Plan
CQAO	Construction Quality Assurance Officer
CQC	Construction Quality Control
EPA	U.S. Environmental Protection Agency
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
MS/MSD	Matrix Spike/Matrix Spike Duplicate
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PDI	Pre-Design Investigation
RAWP	Response Action Work Plan
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
SESC	Soil erosion and sedimentation control
Tetra Tech	Tetra Tech, Inc.
UDEQ	Utah Department of Environmental Quality
UPCM	United Park City Mines
UPDES	Utah Pollutant Discharge Elimination System

1.0 INTRODUCTION

On behalf of LHM DEV RIH LLC (LHM), Tetra Tech, Inc. (Tetra Tech) has prepared this Construction Quality Assurance / Quality Control Plan (CQA/QCP). This CQA/QCP was prepared to support the Response Action Work Plan (Work Plan) for the Richardson Flat Operable Unit 1 (OU1) Site prepared by Tetra Tech (Tetra Tech, 2025). This CQA/QCP complements the Work Plan by providing guidance on technical approaches, procedures, inspections, sample collection, field testing, and laboratory analysis for the work described in the Work Plan. The Work Plan and this CQA/QCP pertain to the work planned for the lands comprising the Richardson Flat Tailing OU1 Site, a portion of Operable Unit 3 (OU3), those areas of parcels SS-87 and SS-88 that are outside of OU1 or OU3 but are impacted by historic mine waste (HMW)) per the requirements specified in the Administrative Settlement Agreement for Response Action by Bona Fide Prospective Purchaser (Settlement) between LHM and the US Environmental Protection Agency (EPA).

1.1 CQA/QCP PURPOSE

The purpose of this CQA/QCP is to describe the planned and systematic construction quality assurance/quality control (CQA/QC) activities that will confirm that the work is constructed in accordance with the requirements of the selected remedy specified in the EPA Record of Decision (ROD) (EPA, 2005), the Construction Drawings, and Technical Specifications. This CQA/QCP specifically provides the following information:

- Protocols to verify that the work will be executed in accordance with the ROD
- Organizational and personnel responsibilities for implementing the CQA/QCP
- Performance standards required to achieve completion of the work
- Verification activities (*e.g.*, inspection, testing, sampling, monitoring, etc.) to confirm satisfactory completion of the work
- Industry standards as referenced on the Drawings and drawing notes, which serve as Technical Specifications
- Procedures for identifying and tracking construction deficiencies and corrective actions
- Field and project documentation procedures
- Procedures for retaining and final storage of project documents.

This CQA/QCP has been prepared in accordance with the Environmental Information Quality Policy (EPA, 2023) and EPA's Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures, OSWER Directive No. 9360.4-01, April, 1990.

1.2 BACKGROUND

The Richardson Flat Tailing Site comprises some 2,700 acres of land located northeast of Park City, Utah in an undeveloped valley of Silver Creek; details regarding the Site and adjacent LHM land is presented in the Work Plan. A 2009 Remedial Investigation and Feasibility Study (RI/FS) divided the Superfund Site into Operable Units (OUs) 1, 2, 3 and 4. The LHM Site includes OU1 but not OUs 2, 3 and 4, except for a small portion of OU3 at the north corner of the LHM Site. OU1 comprises approximately 160 acres of land and had been used as an impoundment for mine tailings since the early 1950s. The first recorded use of OU1 was in 1953 by United Park City Mines (UPCM). A total of approximately seven million tons of tailings were placed on OU1 by UPCM and its leasees between 1953 and 1982. No further use of the Site for mining activities has occurred since that time; however, OU1 has been used for placement of mine-impacted soils and reportedly clean soils for staging and

Draft Construction Quality Assurance / Quality Control Plan
Richardson Flat Operable Unit 1

Project No. 117-9165001
July 11, 2025

PREPARED FOR

LHM DEV RIH LLC
C/O Bradley R. Cahoon
Dentons Durham Jones Pinegar P.C.
111 S. Main St., Ste 2400
Salt Lake City, UT 84111
(801) 297-1270
brad.cahoon@dentons.com

PRESENTED BY

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TETRA TECH, INC.

_____
David S. Wilson, PE, PG
Project Manager/Engineer of Record

_____
Anna Rasmuson, PhD, PG, PE
Geological Engineer

- Terra Core sampler
- VOA plunger
- Hand auger
- Bucket auger
- Split-spoon
- Thin-wall tube

In addition, the following equipment may also be needed for various methods:

- Sample containers, labels, and chain-of-custody forms
- Logbook and field forms
- Stakes or flags for marking sample locations
- Tape for measuring recovery
- Soil classification information
- Wax or caps for sealing ends of thin-wall tube
- "T" Handles
- Stainless steel or Teflon bowls, aluminum pans, or other vessels for composite sampling (made from material that will not interfere with the planned analyses)
- Plastic sheeting
- Decontamination equipment
- Drilling equipment
- Backhoe
- Health and safety equipment

2.0 SOIL SAMPLING PROCEDURES

This SOP presents procedures for collecting test pit, surface soil, and subsurface soil samples. The site sampling plan will specify which of the following procedures will be used.

Soil samples for chemical analysis should be collected in order of decreasing volatility, typically in the following order: (1) volatile organics, (2) semi-volatile organics, and (3) metals. Samples for physical analysis can be containerized after the chemical samples have been containerized. Typical physical analyses conducted include (1) grain size distribution, (2) moisture content, (3) saturated permeability, (4) unsaturated permeability, and (5) Atterberg limits. Additionally, visual descriptions of samples, using the

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processing. Environmental remediation has been performed on parts of OU1, and a parking lot was developed over part of OU1 in 2010.

This CQA/QCP is limited to activities at the OU1 Repository and adjacent LHM lands from which limited quantities of HMW are to be removed for placement within the OU1 Repository.

1.3 PROJECT OVERVIEW

The following actions will be completed by LHM to complete the closure of OU1 as described in the Work Plan:

- Excavate select HMW and place it in the OU1 Repository
- Grade tailings in F-Areas to match surrounding grades
- Place 18 inches of clean cover soil where required as final cover after placement by EPA of OU2 and OU3 materials.
- Construct stormwater management features.

The work to be completed by EPA will include placement of mine waste from OU2 and OU3 into the OU1 Repository, consistent with a CERCLA action memorandum to be issued by EPA. Excavation, hauling, placement and grading of OU2 and OU3 mine waste will be performed by EPA, pursuant to the EPA decision document. Once the EPA action memorandum is issued by EPA and is in effect, LHM will provide to EPA reasonable access to OU1 during this work. LHM and EPA and EPA's contractors will coordinate and work cooperatively regarding the placement of OU2 and OU3 mine waste within the OU1 Repository. The material placement and grading plan work are intended by EPA and LHM to have flexibility in timing and sequencing and in locating, staging, configuring, contouring, sloping, adjusting, modifying, and constructing material piles for future recreational uses and stormwater management.

This CQA/QCP is specific to work performed by LHM and its contractors.

1.4 PLAN ORGANIZATION

This CQA/QCP is organized as follows:

- **Section 1: Introduction** – Provides the purpose of the CQA/QCP, a brief Site description and background, and plan organization.
- **Section 2: Project CQA/QC Organization** – Provides an organization chart, discusses project communication, and presents project personnel and their roles.
- **Section 3: Contractor Submittals** – Presents the Contractor submittal requirements.
- **Section 4: Construction Monitoring Requirements** – Presents project performance monitoring requirements.
- **Section 5 Construction Inspection and Verification** – Discusses general and specific inspection and verification requirements, activities, and frequencies.
- **Section 6: Non-Conformance/Deficiencies & Corrective Action** – Presents construction deficiency identification, control, reporting, and corrective actions.
- **Section 7: Construction Documentation** – Presents project documentation requirements.
- **Section 8: Field Modifications** – Discusses circumstances under which field modifications to the CQA/QCP are warranted.
- **Section 9: Final Project Reporting** – Lists final reporting requirements.
- **Section 10: References** – provides a list of references used to prepare this CQA/QCP.

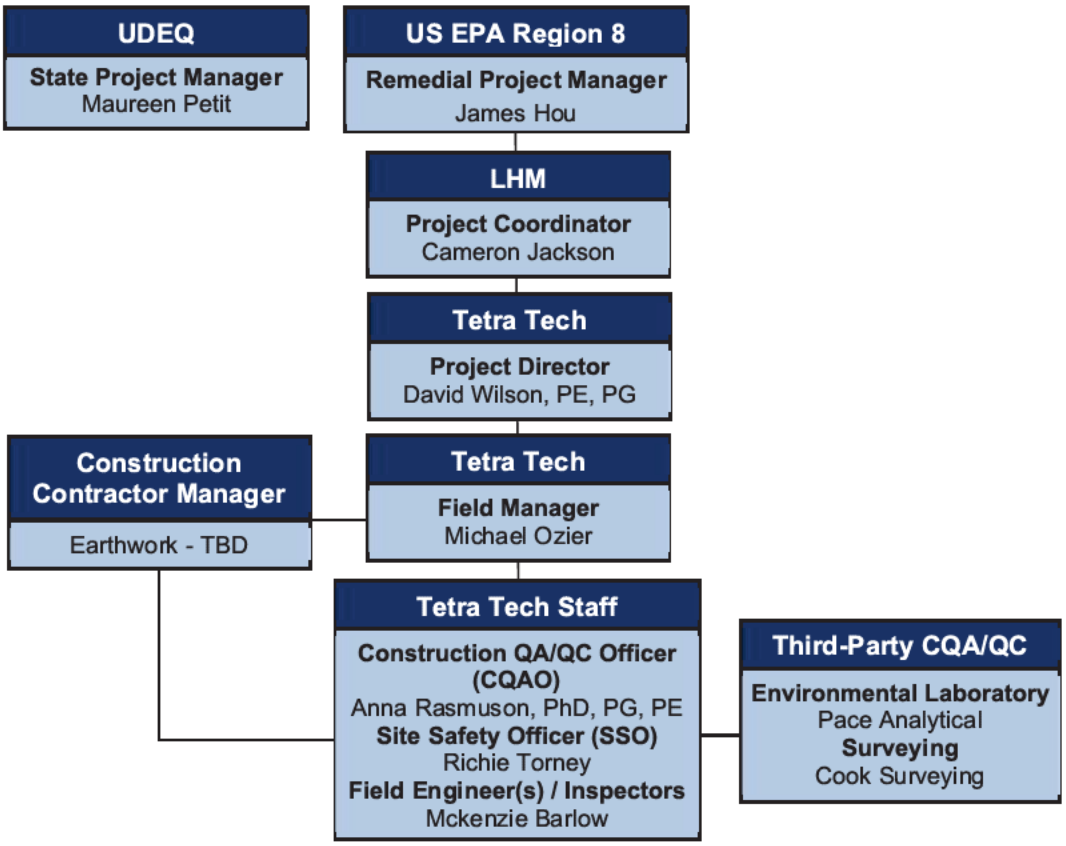
2.0 PROJECT CQA/QC ORGANIZATION

This section presents the responsibilities and authorities of organizations and key personnel involved in the work, the structure of the CQA/QC organization, the minimum required training and experience of CQA/QC personnel, and CQA/QC training to be provided to on-site workers.

2.1 ORGANIZATION CHART

An organizational chart for the work is provided below. This chart shall be reviewed and updated as applicable throughout the work. The chart identifies the regulatory authorities: EPA (lead), and Utah Department of Environmental Quality. LHM serves as the Project Coordinator (Lead Organization) with technical support provided by its Supervising Contractor Tetra Tech. As described in this plan, Tetra Tech is the Engineer, who will oversee the work on behalf of LHM and will retain the Contractor and other subcontractors that will support the work.

PROJECT ORGANIZATION CHART



2.2 PROJECT COMMUNICATION

Project communication between project and construction managers, field personnel (i.e., Engineer and inspectors), and the Contractor will be necessary throughout the response action work. At a minimum, a weekly project conference call will be held during periods of on-site construction to discuss the planned work and

CQA/QC activities for the week and pending weeks, Contractor submittals, project issues, corrective actions, overall project schedule, and anticipated delays due to weather, staffing, equipment, materials, or other issues. The Construction Manager (CM), or designated representative, will take notes during the call and will prepare a weekly call log to summarize the information discussed.

The weekly call log will be disseminated to other key project personnel and maintained electronically with the daily field documentation (notes, logs/forms, and report) for the week (see Section 7). The weekly call log and daily field documentation will be combined into one deliverable and distributed via e-mail at the beginning of the subsequent week to key project personnel. These field forms are provided in **Attachment A**. The weekly call logs will be included in the Construction Completion Report (CCR).

2.3 PERSONNEL ROLES, QUALIFICATIONS, & RESPONSIBILITIES

Table 2-1 presents communication drivers and contact information for responsible project personnel. Personnel training for compliance with Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) 20 CFR Part 1910.120 is required to be up-to-date and will be based on the following project roles:

- Field supervisory personnel: 40-hour initial, 8-hour supervisor, and 8-hour refresher training.
- Field personnel: 40-hour initial and/or 8-hour refresher training, as applicable.
- Occasional or Limited Exposure Personnel: 24 hours of awareness training and one day on-Site supervised training.

Field personnel will also receive OSHA 10-hour Construction Safety Training or equivalent; and at least one field person with current First Aid and CPR Training certificates will be on Site during the work.

3.0 CONTRACTOR SUBMITTALS

This section describes the procedures for tracking, processing, reviewing, and acceptance of submittals from the Contractor to the Engineer as part of the CQA/QC program. Contractor submittals are required documents, plans, material samples or other required items to be provided to the Engineer by the Contractor in accordance with the RAWP and Drawings. Submittals from the Contractor will be tracked and evaluated as they are submitted by the review process detailed in the sections below.

3.1 SUBMITTAL SCHEDULE

The schedule for Contractor submittals will depend on the work being conducted. The Contractor will coordinate timing of submittals based on upcoming work. The deliverable submission schedule will be discussed, at a minimum, during the weekly project conference call to confirm deliverables are on-track with the schedule. Contractor submittals must be reviewed and accepted prior to delivery of related work, materials or supplies at the Site. Therefore, the Contractor must submit the deliverable well in advance of the projected date when work, materials or supplies are required.

3.2 SUBMITTAL COMPLIANCE REVIEW, TRACKING, AND MAINTENANCE

The paragraphs below describe the Contractor submittal review and tracking process, including a submittal numbering and record archiving system.

3.2.1 Review Form & Tracking Table

As indicated above, all Contractor submittals to the Engineer will be tracked using a Submittal Tracking Table. An example table is provided in **Attachment A**. All Contractor submittal reviews and revisions will be tracked using the table. The Contractor Submittal Tracking Table will be maintained in the project files for inclusion in the CCR. The tracking table shall include the following information:

- Contractor Submittal number
- Initial, revised, and acceptance dates of each submittal
- Submittal title and/or description
- Names of reviewers/approvers
- List of associated drawings, as applicable
- Brief submittal description, including other document reference numbers
- The reason for the submittal to be revised and resubmitted (as applicable)

Submittal actions for review status are shown on the table below.

Contractor Submittal Review Process Summary

Review Status	Action
Approved	Approved and accepted as submitted; submittal meet contract requirements.
Approved as Noted	Submittal meets contract requirements with minor corrections notes. A re-submittal is not required but the contractor is required to incorporate the required corrections into the field work.

Revise and Resubmit	The submittal has one or more areas/items that do not meet contract requirements. The area(s)/item(s) in the submittal require revision and a revised submittal provided for review and approval. No work may begin until the revised submittal has been approved.
Rejected	The submittal is inadequate and does not meet contract requirements. The complete submittal needs to be revised and resubmitted for review and approval. No work in the field may begin until the revised submittal has been approved.
Received / Information Only	No action. The submittal is for information purposes only.

3.2.2 Submittal Numbering

Contractor submittals will be assigned a sequential tracking number. The assigned tracking number will be written on the submitted document in the upper right corner of the first page. Submittal numbers will be designed to identify the year of submittal and sequential number of submittals for the year. Submittal numbering specifics are as follows:

- The year the submittal was initially presented for review
- An "S" precursor will be used to identify the document as a construction submittal that requires review
- A sequential number will be assigned that denotes the number of the submittal for that construction year (e.g. 12th submittal for 2025).

For example, the 12th submittal for year 2025 would be numbered: 2025-S12.

Revisions to the submittal will also be tracked. Submittals that require revision will include a modifier, "Rv" that designates the submittal is a revised version of the original submittal. The revision will also include a sequential number to track the number of revisions for that document. For example, if the 12th submittal for 2025 required two revisions prior to acceptance, then the final submittal number would be: 2025-S12-Rv2.

Submittals provided by the Contractor will be provided as electronic PDF files. The electronic submittal file name for each submittal will be labeled the same as the submittal number with a brief added descriptor for quick identification (e.g., 2025-S12-Rv2 Seed Mix). The electronic copy of the submittal shall also include an accompanying Submittal Compliance Review Form (or equal) prepared by the Contractor.

3.2.3 Submittal Maintenance

On behalf of LHM, the Engineer will maintain all Contractor submittals and accompanying review sheets electronically in the project-specific submittal folder. Final submittals will be filed in a folder labeled "Contractor Submittals – Approved," and will be filed separate from submittals that require revision and resubmittal by the Contractor. Initial and revised submittals that required revisions will be stored in an electronic folder labeled "Contractor Submittals – Revision Required" for possible future reference. All final accepted submittals will be included in the project CCR.

4.0 CONSTRUCTION MONITORING REQUIREMENTS

The work will require implementation of many construction-monitoring requirements, including monitoring for dust, noise, and odors. The monitoring procedures will be implemented to aid in the protection of on-site workers and potential off-site receptors, including nearby residents and workers.

Soil erosion and sedimentation control (SESC) will comply with performance and monitoring requirements established by Utah Pollutant Discharge Elimination System (UPDES) General Permit No. UTRC00000. SESC measures (*e.g.*, straw wattles, diversions, berms, detention basins, and silt fencing) will be inspected at the time of installation to ensure compliance with manufacturer installation requirements and the RAWP. Subsequent inspections will be completed by a certified inspector on a biweekly basis or within 24 hours after a precipitation event that results in a stormwater discharge that does not infiltrate into the ground and leaves the construction site or enters waters of the state after a precipitation event. Inspections will be documented in the field notebook/field forms and with photologs. Example forms are provided in **Attachment A**. Observed SESC concerns, or non-conformance/ deficiencies will be documented, and corrective actions developed and implemented within 24 hours.

The Site Health and Safety Plan (HASP) describes site-specific work requirements to safely perform work at the Site. The HASP addresses items specified under OSHA Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120(b), HAZWOPER. The HASP includes health and safety monitoring requirements and action protocols to protect on-site workers.

5.0 CONSTRUCTION INSPECTION & VERIFICATION

Site characterization work completed during the Preliminary Design Investigation (PDI) (Tetra Tech, 2022) identified an estimated quantity of approximately 10,700 cubic yards of HMW impacted by lead requiring removal and relocation to the OU1 Repository. **Drawings C-101 through C-104** shows the primary Site features pertaining to the work, including the excavation areas for HMW and preliminary grading plans for the OU1 Repository.

5.1 GENERAL REQUIREMENTS

Quality assurance/control inspection and verification activities will be required throughout the Work. All inspections will be documented by the Contractor and the Engineer, or their designated representatives. Inspection, photo documentation, and verification work will be required for project materials/supplies, HMW excavation and backfill, final cover for the OU1 Repository, and other support work. Inspection work will be performed to verify compliance with contract documents, Construction Drawings, applicable codes and industry standards, and manufacturer's recommendations and specifications. Periodic photographs will be used to document the response action during and after the Work.

The schedule for testing, inspection, and verification work will be developed based on the construction schedule. The schedule will be communicated to all applicable parties so ample time is provided to successfully coordinate planned activities.

The following table presents general inspection activities required for the response action.

General Inspection & Verification Requirements

Inspection Sequence	General Inspection Activities
Preparatory Inspections	Inspection conducted by Contractor(s) and Engineer, or designated representatives, prior to commencement of work. • Confirm that the inspection includes a review of contract requirements. • Confirm that all materials and/or equipment have been inspected, tested, submitted, and approved. • Notify Blue Stakes of Utah Utility Notification Center (Blue Stakes) of any underground work not less than three working days before performing work using the Blue Stakes web-based locate requests: bluestakes.org or by placing a toll-free call to 811. Verify that all utilities have been located prior to the initiation of work. • Coordinate with Engineer for private utility locate services where needed to protect potential private utilities within work areas, including service lines and laterals that may not be located by Blue Stakes member utilities. • Confirm that all pre-construction surveys have been completed and verified, and any required staking has been completed. • Verify that that the required testing has been planned. • Examine work area to ascertain that all preliminary or preparatory work has been completed (*e.g.*, clearing and grubbing, stormwater runoff controls, overhead electric shielding, etc.).

Inspection Sequence	General Inspection Activities
	• Examine materials, equipment, and samples to ensure they conform to approved shop drawings, submittals, Construction Drawings, or other contract documents. • Verify that all approved materials and/or equipment are on hand or have been ordered to meet project timelines. • Confirm that all monitoring and measuring equipment are in working order and, when applicable, has been installed properly. • Confirm that all monitoring and measuring equipment have been properly calibrated, and that the maintenance and calibration meets manufacturer or project specifications and has been properly documented in field logs. • Verify that all inspections have been recorded, the inspection forms have been scanned and electronically filed per project requirements. • Identify any non-conformance / deficiency issues, develop corrective action requirements, and time frame for completion.
Initial Inspections	The contractor and the Engineer, or designated representatives, will conduct initial inspection of the work feature(s) when a representative portion of the feature(s) have been accomplished. • Examine the quality of workmanship. • Review construction quality control (CQC) testing, as applicable, for compliance with Contract requirements (*e.g.*, Construction Drawings, submittals, or other project documents). • Review dimensional aspects of the work. • Identify non-conformance / deficiency issues, develop corrective action requirements, and time frame for completion.
Follow-Up Inspections	The contractor and the Engineer, or designated representatives, will conduct follow-up inspections at least daily, as applicable. • Verify continuing compliance with all contract requirements. • Verify continuing compliance with CQC testing until the particular work feature(s) is completed. • Conduct final follow-up inspection and ensure that any non-compliance or deficiencies identified during prior inspections have been corrected and comply with project contract requirements (see Section 6.0 regarding non-conformance / deficiencies).
Completion Inspections	The contractor and the Engineer, or designated representatives, will conduct completion inspections of the work feature(s). • Develop a list of items to be addressed and based on non-conformance / deficiencies (see Section 6.0) and schedule to address the list. • Perform a follow-up completion inspection after the list of items has been completed and the Engineer has been notified by the Contractor.

Inspection Sequence	General Inspection Activities
	• Perform a post-construction photogrammetric and topographic survey of the final cover for the OU1 Repository.

5.1.1 Acceptance Criteria

Construction acceptance criteria for materials qualification, inspection, and testing are established in the contract documents, Construction Drawings, and applicable codes and industry standards, and manufacturer's recommendations. Submittals (Section 3), testing, inspection and verification work will document conformance with the acceptance criteria.

5.1.2 Compliance with Handling, Storage, Packaging, Preservation, and Delivery Requirements

The RAWP specifies compliance requirements related to collection of verification soil samples. Field personnel will document all handing, storage, packaging, preservation, and delivery requirements on field forms, notebooks, and through sample chain-of-custody forms.

Construction-related handling, storage, packaging, preservation, and delivery will be documented through inspection of materials, parts, assemblies, and end products in relation to the approved submittals, Construction Drawings, shop drawings, and other applicable reference materials. Field inspectors shall document inspections on field forms/notebooks and in the Daily Reports.

5.2 HMW EXCAVATION VERIFICATION SAMPLING

Excavation of HMW will be conducted laterally and vertically in each excavation area as described in the Work Plan to remove residuals and associated impacted soils containing lead that exceed the Final Cleanup Level of 500 mg/kg. The Work Plan includes estimated excavation volumes for each excavation area. All excavated materials will be placed in the OU1 Repository. Excavated volumes will be tracked via truck counts and volumetric surveying techniques.

5.2.1 General Construction Excavation & Backfill Inspections

The following table provides a list of general construction inspection requirements for excavation and backfill based on the Work Plan and Drawings. The Contractor and Engineer's Field personnel will refer to applicable Construction Drawings for specific CQA/QC requirements.

General Excavation Area Inspection Requirements

Excavation Area / Feature	Description
Clearing & Grubbing	Inspect to verify that work complies with project requirements.
Underground Utilities	Prior to excavation all utilities must be located, avoided, de-energized, shored, or moved.
Overhead Utilities	Prior to mobilizing oversized equipment to the site or transporting it across the Site, all overhead utilities must be identified, flagged and shielded where need.

Excavation Area / Feature	Description
Excavation & Fill Slopes	Verify slopes are constructed to 3H:1V or flatter.
Fill Slopes – OU1 Repository	Verify slopes are constructed with 5% or flatter on the outside of the graded area and 0.5% grade on the interior.
Existing Slopes Steeper than 5H:1V	Inspect: 1) existing slopes to ensure benches were cut into prior to fill placement; 2) the cut benches to ensure they have a minimum vertical face height of 1 foot and are cut wide enough to accommodate compaction equipment; and 3) fill slopes are overbuilt beyond final line and grade and then cut back to develop an adequate compacted slope face.
Site Grading	Inspect to verify that grading has been developed and maintained during and after construction to rapidly drain surface run-off away from construction areas and, where applicable, surface run-off treatment requirements have been implemented and maintained.
Backfill Material	Verify that appropriate backfill material meets the Cleanup Level of 500 mg/kg.

5.2.2 Excavation Criteria and Decision-Making Process

Drawing C-101 shows the HMW excavation areas. The excavation boundaries will be surveyed prior to initiating the removal activities. The sample grids will be established based on the frequency and spacing of samples described in the Work Plan and will be located in the field prior to initiating sampling activities. The final lateral and vertical boundaries of each excavation will be documented through applicable surveying methods (total station, differential global positioning system [GPS], light detection and ranging, etc.). The final excavation limits for each excavation area will be defined in accordance with the table below.

Typically, the XRF Inspection Criteria will be achieved first and then verification sampling will be performed to confirm achievement of the Analytical Criteria. Excavation for a given area will be considered complete when both the XRF Inspection Criteria and Analytical Criteria are achieved.

Summary of Excavation Decision-Making Process

CQA Criteria	Description

XRF Screening Criteria	• Lateral and vertical excavation limits will be assessed based on the following:
	  ○ All observed HMW, or associated visually impacted materials have been removed
	  ○ XRF results are less than 70% of the Cleanup Level of 500 mg/kg (*i.e.*, 350 mg/kg).
	• XRF Screening Criteria shall be achieved prior to implementing the Analytical Criteria.

Analytical Criteria	• Verification sampling will be conducted to verify lateral and vertical excavation limits meet the project requirements. • Verification soil samples will be collected as ten-point composites to evaluate lead concentrations for excavation floors and sidewalls. • Verification of analytical results will be compared to the Cleanup Level of 500 mg/kg. • Decisions will be made to cease excavating or continue excavating based on comparison of the results to the Cleanup Level.

	• If analytical results are above the Cleanup Level, additional excavation will be performed, and the area will be resampled and analyzed for lead. This process will be repeated until laboratory results indicate the excavation is complete.

5.2.3 Excavation Verification Sampling Methods

Soil samples will be collected using the procedures described in SOPs 007 and 012 provided in **Attachment B**. Floor samples will be collected as 10-point aliquots collected from excavation floors in accordance with the sample spacing described in the Work Plan. Sidewall samples will be collected as 10-point aliquots every 300 linear feet in excavations deeper than 2.5 feet. Samples will be packaged and shipped for analysis by an EPA certified laboratory following the procedures described in SOP 027 (**Attachment B**). Sampling equipment will be decontaminated prior to and in between samples following procedures described in SOP 026 (**Attachment B**). A duplicate sample will be collected at a rate of one per every 10 samples to evaluate laboratory precision; other CQA samples will be collected in accordance with Section 5.4 of this CQA/QCP.

5.2.4 Verification Sample Identification Numbering

Verification soil sample identification numbers shall include the following:

- A "VS" prefix to designate the sample is a verification soil sample
- The last two digits of the sample year
- A two-number designation for the excavation area
- A sequential sample number within an excavation area, *i.e.,* he first verification sample within an area will be -001
- A suffix indicating whether the sample was from the excavation floor (FL) or excavation sidewall (SDW).

For example, the third verification soil sample collected in 2025 from the floor of Area 9 would be labeled: **VS-25-09-003-FL**.

5.3 CLEAN COVER SOIL VERIFICATION SAMPLING

Soils in the existing stockpiles in Area B will be used as final cover material if lead concentrations are demonstrated to be less than the Cleanup Level of 500 mg/kg. There is estimated to be approximately 500,000 cubic yards of clean soil stockpiled in Area B, and it is estimated that approximately 131,000 cubic yards will be required to complete the final cover over the expanded F Areas as shown on **Drawing C-104**. All sample points collected during the PDI from Area B had lead concentrations less than 100 mg/kg indicating the soil is suitable for use as final cover materials and possibly other land development needs. However, EPA has requested that additional testing be performed to confirm that these soils are clean on a continuing basis (*i.e.*, satisfy the criteria for cover material and do not contain lead or other constituents above Cleanup Levels). Soil samples will be field screened with a handheld XRF instrument, and a five-point composite samples will be collected for every 5,000 cubic yards for verification analysis by a certified laboratory. Soil sampling procedures will be performed in accordance with SOP 007 (**Attachment B)**.

5.4 INSTALLATION OF FINAL COVER VERIFICATION

LHM will place a final 18-inch-thick, low-permeability soil cover over the F Area and surrounding disturbed areas of the OU1 Repository following consolidation of all HMW from the Property and EPA's wastes from OU2 and OU3 as described in the RAWP. The final cover will be placed to match the contours of the underlying subgrade.

The CQA/QC inspections for the final cover will assure suitable materials are placed at the design thicknesses indicated on **Drawing C-104.** Inspections will be performed in accordance with the general requirements described in Section 5.1 of this CQA/QCP. The final cover will be placed after grading of the imported wastes is completed by EPA in cooperation with LHM. The final cover will achieve the requirements of the ROD to allow recreational use of the OU1 Repository after the work is completed.

The final cover thickness will be measured to verify a minimum of 18 inches are placed. Final cover thickness data will be collected using a grid with 200-foot centers within the area to be graded and capped. The thickness will be measured using grade stakes, a hand coring tool or equivalent method. If cover thickness is less than 18-inches, additional cover placement and measurement will be performed per the procedures in Section 5.1 of this CQA/QCP.

The final cover will have side slopes with 5% grades on the outside and approximately 0.5% grade on the (interior) plateau to enable stormwater runoff in a controlled manner within the Repository. Grades will be confirmed by conventional survey techniques, with final survey results being documented on record drawings to be provided with the final project reporting described in Section 9.0.

The planned cover soil materials from the stockpiles in Area B were tested by Tetra Tech for gradation and permeability, and the results show that this soil satisfies the ROD requirement that the final cover material consist of low-permeability soil; these test results will be provided in the final project reporting described in Section 9.0.

The ROD requires that the top of the final cover include a minimum of six inches of topsoil to support vegetation. Agronomic testing performed by Profile Products on behalf of Tetra Tech has demonstrated that the existing soil in Area B will perform well to develop and sustain vegetative cover with appropriate seed selection, fertilizer and mulching of the final cover consistent with local government requirements and industry standard practices for the area. The agronomic specifications are included in the design on **Drawing C-104**, and the Engineer will inspect and verify that these specifications are achieved. Documentation of the inspections and compliance with the specifications will be provided in the final project reporting described in Section 9.0

Stormwater management features including collection channels and detention basins will be constructed at appropriate locations around the perimeter of the final cover. The locations for these features will depend on the final quantities of waste placed on the OU1 Repository by EPA from OU2 and OU3, established grades, and local stormwater design requirements and practices. Best Management Practices such as channel armoring and erosion controls will be implemented in accordance with ARARs listed in Work Plan, Section 2.3.1. The Engineer will inspect and verify that these features are constructed according to the design, and documentation of the inspections and compliance with the design will be provided in the final project reporting described in Section 9.0.

5.5 QUALITY CONTROL AND QUALITY ASSURANCE

The Engineer and Contractor will establish a CQC test program that confirms that all required inspections and testing are properly identified, planned, documented, and performed under controlled and suitable environmental conditions. Inspections and testing shall be performed as specified in the contract documents, Construction Drawings, applicable codes and industry standards, and manufacturer's recommendations. In some cases, CQA testing performed by the Engineer will preclude the need for separate CQC assessment by the Contractor.

Quality assurance testing will be conducted independent of and in addition to CQC testing by the Contractor. Procedures for collection of samples for soil verification sampling at the excavation areas are presented in the RAWP and other sections of this CQA/QCP. CQA field duplicates will be collected at a rate of one per 10 verification samples, and equipment rinse blanks, field blanks, and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a rate of one per 20 verification samples. A Level II validation report will be prepared by the laboratory.

The CQAO will be responsible for review of all sampling and testing results. Required tests and inspections will be identified and discussed weekly at a minimum, shall be discussed on project conference calls, and more frequently as required to confirm that tests are completed, and the Contractor and on-site inspectors are aware of the requirements to verify compliance. The Contractor, Engineer, and CQAO will review sample collection and test results daily, or at an agreed alternative frequency based on the type of test and identify potential non-conforming test results or deficiencies that require correction.

6.0 NON-CONFORMANCE/DEFICIENCIES AND CORRECTIVE ACTIONS

This section presents construction deficiency identification, control, reporting, and corrective actions.

6.1 NON-CONFORMANCE / DEFICIENCIES DEFINED

Non-conformance / deficiencies will be identified through the submittal process, testing, inspection and verification activities. Non-conformance / deficiencies occur when a material, product, equipment, performed work, or installation does not comply with contract documents, Construction Drawings, and applicable codes and industry standards, and manufacturer's recommendations. The Engineer, CQAO, or designated representative will notify the Contractor of the identified non-conformance / deficiency at the time of discovery and the Contractor shall take immediate corrective action after receipt of notification. Non-conformance / deficiencies will be handled as outlined in the following table:

Non-Conformance and Deficiencies Defined

Issue / Concern Type	Definition
Deficiency (Minor)	1. Identified during test or inspection. 2. Are minor in that they do not require significant rework, repair, or replacement. 3. Will not result in significant deviations from the required quality standard if corrected immediately. 4. Do not require formal action by the Contractor's QC manager. 5. Are reported verbally to the Contractor representative and Contractor supervisor. 6. Can be corrected on the spot after review and discussion with the Contractor's supervisor of the related Construction Drawing or other project document. 7. Are documented in the Daily Report.

Non-Conformance	1. Identified through testing or inspection. 2. Are major deviations from the contract requirements and/or accepted standard of quality, which must be formally documented for corrective action by the field staff or the third-party testing group. 3. Failure by a contractor to correct a minor deficiency after having been put on notice if it is not corrected within 5 days of notification, or other agreed upon time frame. 4. Shall be formally documented in a Non-Conformance & Corrective Action Form and Tracking Table (see below) and distributed to the CQAO and Contractor's quality manager, foreman, and project manager. 5. The designated Contractor representative shall follow up on the non-conformance to verify corrective action has been completed within the agreed schedule. 6. The Contractor in consultation with the Engineer's field personnel shall verify and accept the corrected work by visually inspecting the area/item of non-conformance and documenting the work in the Non-Conformance & Corrective Action Form and Tracking Table, and Daily Report.

6.2 CORRECTIVE ACTIONS

The Engineer, CQAO, or designated representative, will verify non-conformance / deficiency corrective actions are implemented, and the action complies with associated Construction Drawings or other requirements. The designated inspector will confirm that the non-conforming material, equipment, work, installation, or other feature is identified and controlled to prevent unintended use or delivery until corrective action is taken. The non-conforming material or item shall be tagged and segregated by the Contractor, when practical, from conforming material or items to preclude their inadvertent use. For cases where segregation is impossible or impractical due to physical characteristics or other reasons, the non-conformance tag will be displayed prominently to preclude inadvertent use.

The Contractor shall implement corrective actions to remedy work that is out of conformance with Construction Drawings or other requirements. The corrective action will include removal and replacement of deficient work using methods discussed with and approved by the CM. Removal must be accomplished in a manner that does not disturb work that already meets CQA/QC criteria. If work is disturbed during corrective action, it will require retesting and inspection to verify compliance. Any replacement work that does not conform with Construction Drawings or other requirements will again require removal and additional corrective action until that work meets the specified requirements.

6.3 NON-CONFORMANCE & CORRECTIVE ACTION FORM & TRACKING TABLE

A Non-Conformance & Corrective Action Form will be completed for each non-conformance issue/concern identified, with each non-conformance event receiving a unique event number for tracking, described in Section 6. 4. The Form is a formal notification to the Contractor that the work does not meet the Construction Drawings or other criteria for the project. An example form is provided in **Attachment A.** Items of work found to be non-conforming will be identified and described on the Form and reference the specific Construction Drawing or other requirement not met. The Form will also detail the required corrective action and schedule that must be met. The

non-conformance issue will be documented on a Non-Conformance & Corrective Action Tracking Table (**Attachment A**) to ensure corrective actions and follow up inspections are completed within the specified schedule.

6.4 SEQUENTIAL NON-CONFORMANCE TRACKING NUMBER

Each non-conformance event will be assigned a unique, sequential number for logging and tracking purposes. The assigned number will be documented on the Non-Conformance & Corrective Action Form and Tracking Table. The tracking number will be designed to identify the year of submittal and sequential number of the non-conformance for the year. Tracking number specifics are as follows:

- The last two digits of the year the non-conformance occurred
- An “NC” precursor will be used to identify the “non-conformance” event
- A sequential two-digit number will be assigned that denotes the number of the non-conformance event for that construction year (e.g., 8th non-conformance event for 2025).

For example, the 8th non-conformance for year 2025 would be numbered: 25-NC-08.

6.5 PREVENTATIVE ACTIONS

Preventative actions will be taken to eliminate the cause of potential non-conformity. The Contractor and the project team shall take preventative actions, as necessary, to eliminate the causes of potential deficiencies to limit or prevent their occurrence. The Contractor QC personnel shall monitor, inspect, and audit processes used to prevent erroneous information or construction products from being passed on to the project. The Engineer, CAQO, or designated representative have the authority to implement, verify, and review the Contractor’s preventative and corrective action effectiveness. They are empowered to improve the project’s work processes to eliminate the causes of potential non-conformance.

7.0 CONSTRUCTION DOCUMENTATION

Project documentation must cover all aspects of the CQA/QC program activities. The Contractor and Engineer, or their designated representatives, are responsible for daily documentation of project activities and CQA/QC activities and events. All CQA/QC oversight and construction activities will be documented in field notebooks, forms/logs, and reports. The goal of daily record keeping is to provide sufficient records and documentary evidence of the quality of construction, field testing, laboratory analysis, and other activities that affect work quality. All notebooks, forms, logs, and reports generated in the field will be scanned and electronically filed in the project folder for potential inclusion in the CCR. **Attachment A** provides example construction forms that will be used for this project. Field notes should be recorded in general accordance with SOP 002 provided in **Attachment B**.

7.1 GENERAL DOCUMENTATION

Bound field notebooks with numbered pages (e.g., Rite-in-the-Rain, or similar) will be used by field personnel responsible for monitoring and recording construction activities. All field documentation will be required to be in permanent, indelible blue or black ink. Deletions will be struck through with a single line. Field forms will be completed and maintained digitally by the field staff during the work.

General project documentation through field notebooks, forms, and the Daily Report will include the following as appropriate:

- Project name and date on all pages
- Sequential numbers on all notebook or forms pages
- Dated and initialed on bottom of each page the field worker's/inspector's notebook
- Time (in 24-hour notation) of all activities
- Weather conditions including temperature, cloud cover, precipitation (updated as conditions change)
- Record of visitors
- Meetings held and meeting participants
- Location(s) of construction occurring
- Equipment and field and construction personnel working in each activity
- Description of work being performed and associated inspections, testing, sampling, etc.
- Decisions made regarding approval of submittals, materials, work, non-conformance/ deficiencies, and corrective actions taken
- Description of problems, delays, or issues/concerns
- Communications with construction or other third-party contractor staff
- Completed construction activities and/or update on on-going construction progress
- Photographs that document daily project progress, inspected materials, equipment, or work, key work features, and other specific construction events, with select photographs included in photograph log of Daily Construction Report
- Signature of field personnel shall be included on Site entry log; inspection, testing, sampling forms; and the Daily Construction Report.

Soil samples collected by the field staff will be documented in a Soil Sample Log. The Soil Sample Log will include sample identification numbers; soil types/textures; sample dates/times, depth, sampling equipment used;

color, odor, and appearance of the samples; sample parameters; container descriptions; sample preservatives; and names of sampling personnel. An example Soil Sample Log is provided in **Attachment A**.

7.2 AS-BUILT RECORD DRAWINGS

The Contractor will track field modifications on Construction Drawings and be responsible for as-built red-line drawings in the field. The Contractor will mark the drawings in the field as the project progresses to indicate as-built conditions. Red-line field drawings will be used to produce final As-Built Drawings to record the final construction conditions. Where modifications were made to a specified material, dimensions, location, or other feature, the As-Build drawings will indicate the work performed. As-Built Drawings will be produced upon completion of the initial work by LHM to document the HMW soil relocation and grading, and the subsequent phase of final capping after EPA relocates OU2/OU3 materials to the OU1 Repository and LHM completes the final cover installation. The Contractor will submit as-built red-line mark-up drawings to the Engineer who will incorporate the mark-ups and issue the final As-Build Drawings, which will be included in the final project CCR.

7.3 CONTROL OF QUALITY RECORDS

The CQAO shall verify the QA record accuracy and shall maintain copies of quality-related documentation. Quality records will be scanned and electronically maintained in the project folder for inclusion with the CCR. The Engineer or designated representative will have the primary responsibility for the centralized document control files for the project and construction documentation. This includes, but may not be limited to:

- Daily construction QA forms, test and sample logs, notebooks, records
- Inspection checklists and reports
- Surveillance reports
- Non-conformance and corrective action reports and tracking table
- Material receiving reports
- Monitoring and test data.

The Contractor will provide to the Engineer (or designated representative) within 3 business days of receipt: 1) electronic or paper copy (suitable for scanning) of all QC documentation associated with the work; and 2) one electronic copy of all required submittals. The Contractor is required to maintain a fire-resistant storage facility for storage of original documents. The facility shall contain all contract documents, inspection reports, test records, and project and daily field reports. All records shall be available for inspection and audit at any time by the Engineer.

8.0 FIELD MODIFICATIONS

Field modifications related to CQA/QC are anticipated to be limited. Any changes to the CQA/QC processes or Construction Drawings will be documented as discussed in the above sections. Modifications to this CQA/QCP may be needed: 1) to account for changes in the project or project personnel; 2) if CQA/QC procedures or controls are inadequate to support the work being produced in conformance with the specified quality requirements; or 3) are deemed to be more excessive than required to support work being produced in conformance with project quality requirements. Changes to the CQA/QC requirements will be reviewed with the EPA and UDEQ, and upon agreement a CQA/QCP Amendment or revised CQA/QCP will be submitted to EPA and the UDEQ for review and EPA approval prior to implementation of the revisions.

9.0 FINAL PROJECT REPORTING

Final project reporting will consist of a CCR that includes the As-Built Record Drawings upon completion of all the work. The CCR will summarize the work completed and include the following information at a minimum:

- Dates of work performance
- Scope of work completed
- Contractor(s) performing the work
- Modifications or changes from the Construction Drawings
- Documentation of performance and compliance with CQA/QC requirements
- Statement of work completion in general accordance with the Construction Drawings except as noted in the CCR
- Supporting documentation including Daily Construction Reports, completed inspection and testing logs, and photographs
- The CCR will be provided to the EPA/UDEQ within 90 days of completion of each phase of work.

10.0 REFERENCES

Tetra Tech, *Remedial Action Work Plan for Richardson Flat OU1, Summit County, Utah.* April 18, 2025

Tetra Tech, Inc., *Preliminary Design Investigation Report Richardson Flat Operable Unit 1 and Surrounding Lands Summit County, Utah*. November 17, 2022.c

U.S. Environmental Protection Agency, *Administrative Order on Consent for Remedial Investigation/Feasibility Study Richardson Flat Tailings Site*, September 28, 2000.

U.S. Environmental Protection Agency, *Richardson Flat Tailings Site Record of Decision*, July 8, 2005.

U.S. Environmental Protection Agency, *Parcels No. SS-88 Notice of Consent Decree,* November 19, 2007.

U.S. Environmental Protection Agency, *Environmental Information Quality Policy,* IT/IM Directive Policy No. CIO 2105.4, August 21, 2023.

U.S. Environmental Protection Agency, *Quality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures,* OSWER Directive No. 9360.4-01, April, 1990

Tables

Table 2-1
Personnel Roles, Qualifications, and Responsibilities
Construction Quality Assurance / Quality Control Plan
Richardson Flat Operable Unit 1 and Surrounding Lands
Summit County, Utah

PERSONNEL ROLES, QUALIFICATIONS & RESPONSIBILITES			
Communication Driver	**Project Role & Personnel**	**Education & Experience Qualifications**	**Responsibility / Pathways**
Agency Project Monitoring & Approvals	**Remedial Project Manager** *James Hou* *720-376-9326* *Hou.James@epa.gov*	EPA project manager	Monitors project progress, reviews and approves project documents, engages with project management personnel, and informs stakeholders.
Administrative Point-of-Contact with EPA	**Project Coordinator** *Cameron Jackson*		Provides project submittals to EPA Remedial Project Manager, and other stakeholders, in accordance with the project schedule.
Technical Contact with EPA	**Project Director** *David Wilson, PE, PG* *Tetra Tech* *801-916-6957* *Davidwilson.wilson@tetratech.com*	M.S. Civil Engineering (geotechnical and environmental emphasis), B.S. Geological Engineering, registered Professional Engineer and Professional Geologist, 30 years of experience.	Coordinates with Project Coordinator to provide project submittals to Michael Berkoff, EPA, and other stakeholders in accordance with the project schedule. Serves as Tetra Tech's liaison to the EPA and other stakeholders for project activities.
Technical Advisors during Construction	**Engineers of Record** David Wilson, PE, PG		Assist PM and CQAO Address technical issues that arise during construction that may affect CQA and CQC activities and requirements to ensure work is conducted per project requirements of the RA.
Inspections, Daily Field Reports, and Primary Laboratory Contact	**Field Inspector(s)** *Michael Ozier* *Tetra Tech* *Michael.Ozier@tetratech.com* *Mckenzie Barlow* *Tetra Tech* *Mckenzie.Barlow@tetratech.com*	B.S. in Geology with two years of experience	Responsible for assisting the CQAO with on-site coordination, management and oversight of subcontractors, field personnel, and third-party testing/analytical verification, and inspections. Documents daily field activities, testing, and inspections through preparation of daily field reports, photographs, and other documentation, as necessary. Assists CQAO with identification, documentation, and notification of non-compliance and/or work deficiencies and oversees corrective action.
Project CQA & CQC	**Construction Quality Assurance / Quality Control Officer (CQAO)** *Anna Rasmuson* *Tetra Tech* *801-440-6590* *Anna.Rasmuson@tetratech.com*	B.S. in Geoscience, PhD in Geological Engineering, Professional Geologist and Professional Engineer, 10 years of experience	Conducts data review, verification, and validation of laboratory data and construction test results. Releases data once the data review effort has been completed and approves of the release.

Table 2-1
Personnel Roles, Qualifications, and Responsibilities
Construction Quality Assurance / Quality Control Plan
Richardson Flat Operable Unit 1 and Surrounding Lands
Summit County, Utah

PERSONNEL ROLES, QUALIFICATIONS & RESPONSIBILITES			
Communication Driver	**Project Role & Personnel**	**Education & Experience Qualifications**	**Responsibility / Pathways**
On-Site Health & Safety	**Site Safety Officer (SSO)** *Richie Torney* *Tetra Tech* *Richie.Torney@tetratech.com*	B.S. in Geology, 2 years of experience.	Conducts and documents daily health and safety tailgate meetings, conducts safety checks and audits of workers and subcontractors, documents and coordinates project safety with project personnel and visitors to work areas. Documents and reports incidents to CQAO and PM.
Construction Implementation Subcontractors	**Construction Subcontractor Manager(s) (CSM)** *TBD*		Responsible for implementation of the project work as per individual contracts. Provides labor, materials, and equipment to complete the work as scheduled to meet project requirements. Works directly with the CQAO to ensure compliance with project specifications, drawings, and all other applicable project documents and contract. Notifies the CQAO immediately of labor, equipment, or material delays or shortages, discrepancies identified between project documents that affect construction, and/or any other potential issues anticipated or identified. Works with CQAO during inspections and testing to verify CQA/QC meet project requirements and implements non-compliance or deficiency corrective actions within negotiated schedule.

Table 2-1
Personnel Roles, Qualifications, and Responsibilities
Construction Quality Assurance / Quality Control Plan
Richardson Flat Operable Unit 1 and Surrounding Lands
Summit County, Utah

PERSONNEL ROLES, QUALIFICATIONS & RESPONSIBILITES			
Communication Driver	**Project Role & Personnel**	**Education & Experience Qualifications**	**Responsibility / Pathways**
Surveying and Laboratory QA and Reporting	**Third Party CQA/QC Subcontractors** *Environmental Laboratory* *Pace Analytical* *Surveying* *Cook Surveying*		Responsible for conducting surveying to establish and verify project boundaries, excavations, cuts/fills, grades, slopes, reference points, volumes, and other key information, as required to meet project requirements and provide information for contractor payments. Responsible for testing and analytical verification subcontractors. Points of contacts will be responsible for project setup and coordinating laboratory analyses and arranging shipment of sample containers to ensure the testing/analyses meet project reporting requirements. All QA/QC issues with project field samples will be reported in the project narrative and reviewed by the laboratory QA officer.

Attachment A
Field Forms

TETRA TECH

DAILY REPORT

Project Name: _____ Date of Site Activity: _____

Project Number: _____ Site Location: _____

Weather: _____

Contractors on-site working for Tetra Tech: _____

Contractor's Employees: _____

Contractor's Equipment: _____

Tetra Tech Employees: _____ Odometer: _____ / _____

Tetra Tech Equipment: _____ Calibrated Today? (Y/N) _____

Visitors: _____

==========

Objective/Scope of Work: _____

_____

Site Activity: _____

_____

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Signature: _____ Date: _____ Page _____ of _____

Reviewed by: _____

DAILY FIELD ACTIVITY LOG
TETRA TECH, INC.

Project:	**Date:**
Project Location:	**Start Time:**
Client:	**End Time:**
Tt Project #:	**Tt Field Supervisor:**
Tt Project Manager:	**Other Tt Personnel:**

Field Conditions *(Ground, Weather, Temperature, etc.)*

Time:	Conditions:
Time:	Conditions:

Tetra Tech Equipment Log

Equipment Type	Model # / Serial #	Use *(Soil screening, etc.)*	Usage *(Hours, days)*

Subcontractor Personnel Log

Name	Work Assignment *(Operator, Laborer, Flagger, etc.)*	Hours

Subcontractor & Equipment Log

Subcontractor	Equipment (Make & Model)	Hours	Equipment (Make & Model)	Hours

Haul Loads

Subcontractor	Truck# / Description	Load Type *(Impacted Soil, Backfill)*	Specify Disposal Facility or Clean Borrow Source	Quantity	Unit
			Daily Load Total - Impacted Soil		
			Daily Load Total - Clean Backfill		

Visitors Log

Name	Agency	Time On-Site / Time Off-Site	Notes
		/	
		/	
		/	

Time	Work Activity Description

Incidents/Concerns/Comments:

Field Personnel Signature:	**Printed Name:**	**Date:**

TETRA TECH

Photograph Log Summary Form

Project Name: ______________________________

Address: ______________________________

City: ______________________________

Project Manager: ______________________________

Field Resource: ______________________________

Field Contact: ______________________________

Telephone #: ______________________________

Event Due Date: ______________________________

Project Number: ______________________________

Type of Photo Equipment:

Number	Direction	Description

TETRA TECH

Photograph Log

Richardson Flat Site - Operable Unit 1

Summit County, Utah

Insert Photo	
Photo description	

SUBMITTAL TRACKING TABLE
Richardson Flat Site - Operable Unit 1
Summit County, Utah

Technical Specification(s) / Drawing(s)	Submittal Number	Submittal Title / Description	Submittal Revision Number	Initial Submittal Date	Revised Submittal Date	Reviewer Name	Reviwer Role	Review Date	Acceptance Date	Rejection Date	Approval / Rejection Action Taken *(see below)*	Notes

Approval / Rejection Action Taken
1. Approved *(Approved as submitted)*
2. Approved As Noted *(No re-submittal required.)*
3. Revise and Resubmit *(Changes needed to portion of submittal.)*
4. Rejected *(Inadequate, complete re-submittal required.)*
5. Information Only (No response action required)
6. Received, No Action Taken (Receipt noted, no further action needed).

TETRA TECH

WEEKLY CONFERENCE CALL LOG

Date:	Insert text	***Time:***	Insert text
Tetra Tech Participants:	Insert text		
Subcontractor Participants:	Insert text		
Other Participants:	Insert text		
Conference Call-In Number:	Insert text	***Passcode:***	Insert text

HEALTH & SAFETY

Discuss health and safety topics – weekly safety reminder/topic, and any observations, near misses, incidents.

ON-GOING CONSTRUCTION WORK

Discuss status of on-going work, anticipated delays due to weather, ground conditions, personnel, or equipment shortages, etc.

UP-COMING CONSTRUCTION WORK

Discuss work planned for the following week, month, etc., needs and arrival date of new equipment, supplies, or personnel, forseen issues based on current on-going work.

INSPECTIONS & VERIFICATION SAMPLING

Inspection or Verification	**Inspection or Verification Sampling Feature**	**Estimated Inspection / Verification Sampling Date**

If needed, provided summary of inspection or sampling discussions.

SUBMITTALS IN REVIEW

Submittal #	**Submittal Title**	**Initial Submittal Date**	**Review Status**

If needed, provide summary of submittal discussion – issues, concerns, delays, revision needs, etc.

TETRA TECH

WEEKLY CONFERENCE CALL LOG

UP-COMING / PENDING SUBMITTALS

Submittal Needed	Associated Work Task	Anticipated Work Start Date	Anticipated Date Submittal to Reviewers

If needed, discuss any upcoming/pending submittals that will need to be submitted for work planned in the coming weeks and any issues or concerns discussed.

NON-CONFORMANCE / DEFICIENCIES

Non-Conf / Def Number	Non-Conformance / Deficiency	Corrective Action Status	Anticipated Completion Date	Anticipated Inspection Date

If needed, summarize any non-confromance / deficiency discussions, concerns, etc..

AGENCY CONCERNS

Discuss any concerns of agencies, how the concern will be addressed, etc.

ADJOINING LANDOWNER OR PUBLIC CONCERNS

Discuss any concerns expressed by adjoining landowners and public, how the concern will be addressed, etc.

VISITORS

Visitor Name	Purpose of Visit	Date	Other

List visitors or upcoming visitors and purpose.

OTHER

Discuss/summarize any other issues or concerns.

TETRA TECH

SOIL SAMPLING LOG

Project:	**Task:**	
Field Staff:	**Weather:**	**Date:**
Sampling Method/ Equipment:	**Decontamination Method:**	

Sample ID	Date	Time	Location (coordinates or description)		Soil Description (USCS Classification, texture, color, biota, debris, sheens, odor, moisture, vertical changes, etc.)	Sample Type**	Intended Analyses	Sample Notes
			NORTHING	EASTING				

Sampling Initiated (hrs):	Sampling Ended (hrs):	COC No.:	COC Time:

Material Codes: AG=Amber Glass; CG=Clear Glass; PE=polyethylene; WM=wide mouth; O=Other (Specify): _____

**** Sample Type:** C = Composite; D = Duplicate; G = Grab; P = Primary; other _____

Sample Container Specification				Intended Analysis and/or Method
No.	Material Code	Volume	Preserv.	

Remarks: (color, odor, sand & silt content, factors possibly affecting samples; condition of sampling apparatus, etc.)

Signature(s): _____

TETRA TECH

Non-Conformance & Corrective Action Form

Richardson Flat Site - Operable Unit 1

Summit County, Utah

General Non-Conformance Information			
Project & Task Number:		Non-Conformance Tracking Number:	
Construction Phase:		Date Non-Conformance Observed:	
Associated Project Work Area:		Date of Notice to Subcontractor:	
Non-Conformance Observed By (Name & Project Role):		Corrective Action Due Date:	
Applicable Technical Specification(s)/Drawing(s)/Contract Requirement(s):			

Details of Non-Conformance Observations:
(include photographs, as necessary, in attached photograph log)

Required Corrective Action:

Attachment B
Soil Sampling Standard Operating Procedures

1.0 BACKGROUND

Complete and accurate field documentation is critical to a successful project and the field log book is an important tool to support field documentation needs. The field logbook should include detailed records of all field activities, document interviews with people, and record observations of conditions at a site. Entries should be described in a level of detail to allow personnel to reconstruct, after the fact, activities and events that occurred during their field assignments. Furthermore, entries should be limited to facts. Avoid speculation related to field events and do not record hearsay or unfounded information that may be presented by other parties during field activities. For example, do not record theories regarding the presence or absence of contamination when you are collecting field screening data or speculation regarding the reasons for a property owner's refusal to grant access for sampling.

Field logbooks are considered accountable documents in enforcement proceedings and may be subject to review. Therefore, the entries in the logbook must be accurate and detailed but should not contain speculative information that could conflict with information presented in subsequent project deliverables and correspondence. Also, be aware that the field logbooks for a site may be a primary source of information for depositions and other legal proceedings that may occur months or years after field work is complete and long after our memories have faded. The accuracy, neatness, and completeness of field logbooks are essential for recreating a meaningful account of events.

1.1 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide guidance to ensure that field logbook documentation collected during field activities meets all requirements for its later use. Among other things, field logbooks may be used for:

- Identifying, locating, labeling, and tracking samples
- Recording site activities and the whereabouts of field personnel throughout the day
- Documenting any deviations from the project approach, work plans, quality assurance project plans, health and safety plans, sampling plans, and any changes in project personnel
- Recording arrival and departure times for field personnel each morning and evening and weather conditions each day

- Describing photographs taken during the project.In addition, the data recorded in the field logbook may later assist in the interpretation of analytical results. A complete and accurate logbook also aids in maintaining quality control, because it can verify adherence to project scope and requirements.

1.2 SCOPE

This SOP establishes the general requirements and procedures for documenting site activities in the field logbook.

1.3 DEFINITIONS

None.

1.4 REFERENCES

Compton, R.R. 1985. *Geology in the Field*. John Wiley and Sons. New York, NY.

1.5 REQUIREMENTS AND RESOURCES

The following items are required for field notation:

- Field logbooks
- Ballpoint pens or Sharpies with permanent waterproof ink
- 6-inch ruler (optional)

Field logbooks should be bound (sewn) with water-resistant and acid-proof covers, and each page should have preprinted lines, numbered pages, and a single column. They should be approximately $7^1/_2$ by $4^1/_2$ inches or $8^1/_2$ by 11 inches in size. Loose-leaf sheets are not acceptable for use as field notes.* If notes are written on loose paper, they must be transcribed as soon as possible into a bound field logbook by the same person who recorded the notes originally. **Note: Data collection logs and field forms used to record field measurements and data are acceptable as loose-leaf sheets maintained in a three-ring binder with numbered pages.*

Ideally, distribution of logbooks should be controlled by a designated person in each office. This person assigns a document control number to each logbook and records the assignment of each logbook distributed (name of person, date distributed, and project number). The purpose of this

procedure is to ensure the integrity of the logbook before its use in the field, and to document each logbook assigned to a project. If more than one logbook is assigned to a project, this process will ensure that all logbooks are accounted for at project closeout.

2.0 PROCEDURES

The following subsections provide general guidelines and formatting requirements for field logbooks, and detailed procedures for completing field logbooks.

2.1 GENERAL GUIDELINES

- A separate field logbook must be maintained for each project. If a site consists of multiple subsites (or operable units), designate a separate field logbook for each subsite. Similarly, if multiple activities are occurring simultaneously requiring more than one task leader (well installation, private well sampling, or geophysical survey.), each task leader should maintain a separate field logbook to ensure that each activity is documented in sufficient detail.
- At larger sites, a general field log may be kept at the site trailer or designated field office to track site visitors, document daily safety meetings, and record overall site issues or occurrences.
- Data from multiple subsites may be entered in one logbook that contains only one type of information for special tasks, such as periodic well water-level measurements.
- All logbooks must be bound and contain consecutively numbered pages.
- No pages can be removed from the logbook for any purpose.
- All information must be entered using permanent, waterproof ink. Do not use pens with "wet ink," because the ink may wash out if the paper gets wet. Pencils are not permissible for field notes because information can be erased. The entries should be written dark enough so that the logbook can be easily photocopied.
- Be sure that all entries are legible. Use print rather than cursive and keep the logbook pages free of dirt and moisture to the extent possible.
- Do not enter information in the logbook that is not related to the project. The language used in the logbook should be factual and objective. Avoid speculation that could conflict with information presented in subsequent project deliverables and correspondence (see Section 1.0 above).
- Use military time, unless otherwise specified by the client.
- Include site sketches, as appropriate.
- Begin a new page for each day's notes.

- Include the date at the top of each page.
- At the end of a day, draw a single diagonal line through any unused lines on the page, and sign at the bottom of the page. Note and implement any client specific requirements (for example, some U.S. Environmental Protection Agency (EPA) programs require each logbook page to be signed).
- Write notes on every line of the logbook. Do not skip any pages or parts of pages unless a day's activity ends in the middle of a page.
- If a line is left blank for some reason, cross out (with a single line) and initial to prevent unauthorized entries.
- Cross out (with a single line) and initial any edits to the logbook entries. Edits should only be made if the initial entry is illegible or erroneous. Do not make corrections for grammar.

2.2 LOGBOOK AND DAILY REPORT FORM FORMAT

The layout and organization of each field logbook and daily report form should be consistent and generally follow the format guidelines presented below. Some clients or contracts may have specific formatting guidelines that differ somewhat from this SOP; review client requirements at the start of the project to help ensure any client-specific guidelines are integrated.

2.2.1 Logbook Cover

Write the following information on the front cover of each logbook using a Sharpie or similar type permanent ink marker:

- Logbook document control number (assigned by issuer)
- "Book # of #" (determined by the project manager if there is more than one logbook for the project)
- Contract and task order numbers
- Name of the site and site location (city and state)
- Name of subsite (or operable unit), if applicable
- Type of activity (if logbook is for specific activity, such as well installation or indoor air sampling)
- Beginning and ending dates of activities entered in the logbook

2.2.2 Inside Cover or First Page

Spaces are usually provided on the inside front cover (or the opening page in some logbooks) for the company name, address, contact names, and telephone numbers. If preprinted spaces for this information are not provided in the logbook, write the information on the first available page. Information to be included on the inside front cover or first page includes:

- Tetra Tech project manager and site manager and phone numbers
- Tetra Tech office address
- Client contact and phone number
- Site safety officer and phone number
- Emergency contact phone number (911, if applicable, or nearest hospital)
- Subcontractor contacts and phone numbers
- Site property owner or property manager contact information

2.2.2 Daily Report Form

The daily report form is a pre-printed template that uses loose leaf pages, numbered sequentially, for each day of work. Each field data form will include a field to enter project-specific information. All the general guidelines and procedures for field logbook entries will apply for entries in the field form. Specific details for daily report form entries are provided in Section 2.3.

2.3 ENTERING INFORMATION IN THE LOGBOOK OR DAILY REPORT FORM

The following lists provide guidance on the type of information to be included in a typical field logbook and daily report form. This guidance is general and is not intended to be all-inclusive. Certain projects or clients may specify logbook requirements that are beyond the elements presented in this SOP.

General Daily Entries:

- Document what time field personnel depart the Tetra Tech office and arrive at the hotel or site. If permitted by the client to charge travel time for site work, document what time personnel leave and arrive at the hotel each day. (This information may be needed at remote sites where hotel accommodations are not near the site.)
- Indicate when all subcontractors arrive and depart the site.
- Note weather conditions.
- Include the date at the top of each page.

- Document that a site safety meeting was held and include the basic contents of the meeting.
- List the level of protection to be used for health and safety.
- Summarize the day's planned activities.
- Summarize which activities each field team member will be doing.

Field Activity Entries:

- Refer to field data collection forms for details about field data collection activities (for example time, date, depth of samples, field measurements). If separate field sampling sheets are not used, see section below regarding logbook entries for sampling activities.
- Refer to well purge forms, well construction logs, and other activity-specific forms as applicable rather than including this type of information in the field logbook. These other forms allow the information to be more accessible at a later date.
- List any air monitoring instrumentation used, with readings and locations.
- Refer to instrument field logs for equipment calibration information.
- Summarize pertinent conversations with site visitors (agency representatives, property owners, client contacts, and local citizens).
- Summarize any problems or deviations from the quality assurance project plan (QAPP) or field sampling plan.
- Document the activities and whereabouts of each team member. (As indicated in Section 2.1, multiple logbooks may be required to ensure sufficient detail for contemporaneous activities).
- Indicate when utility clearances are completed, including which companies participated.
- Indicate when verbal access to a property is obtained.
- Include names, addresses, and phone numbers of any pertinent site contacts, property owners, and any other relevant personnel.
- Document when lunch breaks or other work stoppages occur.
- Include approximate scale for all diagrams. If a scale is not available, write "not to scale" on the diagram. Indicate the north direction on all maps and cross-sections, and label features on each diagram.

Sampling Activity Entries: The following information should typically be on a sample collection log and referenced in the log book. If the project does not use sample sheets as a result of project-specific requirements, this information should be included in the logbook.

- Location description
- Names of samplers

- Collection time
- Designation of sample as a grab or composite sample
- Type of sample (water, sediment, soil gas, or other medium)
- On-site measurement data (examples: pH, temperature, dissolved oxygen, and specific conductivity)
- Field observations (odors, colors, weather)
- Preliminary sample description
- Type of preservative used.
- Instrument readings, if applicable

Closing Daily Entries:

- Describe decontamination procedures (personnel and equipment).
- Describe handling and disposition of any investigation-derived wastes.
- Summarize which planned activities were completed and which ones were not.
- Note the times that personnel depart site for the day.
- Summarize any activities conducted after departing the site (paperwork, sample packaging, etc.). This may be required to document billable time incurred after field activities were completed for the day.

Photographic Log Entries:

- For digital photographs, indicate in the text that photographs were taken and the location where the photographs can be found (for example, in the project file).
- Camera and serial #
- Photographer
- Date and time of photograph
- Sequential number of the photograph and the film roll number or disposable camera used (if applicable)
- Direction of photograph
- Description of photograph

2.4 LOGBOOK AND DAILY REPORT FORM STORAGE

Custody of logbooks and daily report forms must be maintained at all times. During field activities, field personnel must keep the logbooks and daily report forms in a secure place (locked car, trailer, or field office) when the logbook is not in personal possession. When the field work is over, the logbook should be included in the project file, which should be in a secured file cabinet. The logbook or daily report forms may be referenced in preparing subsequent reports and may also be scanned for inclusion as an appendix to a report. However, it is advisable to obtain direction directly from the client before including the logbook as a report appendix, because its inclusion may not be appropriate in all cases.

2.5 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHAs) for a project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment (PPE) necessary to address potential hazards. The hazards specific to project tasks must be identified and controlled to the extent practicable and communicated to all project personnel via the approved, project-specific Health and Safety Plan (HASP).

1.0 BACKGROUND

Soil is sampled for three main reasons: (1) for chemical analysis in the laboratory, (2) for physical analysis in the laboratory, or (3) for evaluation in the field (for example, visual classification, assessment of staining, and field screening). These three sampling objectives can be achieved separately or in combination. Sampling locations are typically chosen to provide information in both the horizontal and vertical directions. A sampling and analysis plan or a site-specific quality assurance project plan (QAPP) is used to outline sampling methods and to provide a preliminary rationale for sampling locations. Sampling locations may be adjusted in the field based on the screening or sampling methods used and the physical features of the area.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for soil sampling. Soil is sampled to evaluate the chemical and physical characteristics of surface and subsurface soils.

1.2 SCOPE

This SOP describes procedures for soil sampling in different areas using various implements. It includes procedures for test pit, surface soil, and subsurface soil sampling and describes a variety of soil sampling devices.

1.3 DEFINITIONS

Bucket Auger: A type of auger that consists of a cylindrical bucket 10 to 72 inches in diameter with teeth arranged at the bottom.

Composite Sample: A sample that consists of soil combined from more than one discrete location. Typically, composite samples consist of soil obtained from several locations and homogenized in a stainless steel or Teflon bowl, tray, or plastic bag.

Core Sampler: A thin-walled cylindrical metal tube with diameter of 0.5 to 3 inches, a tapered nosepiece, a "T" handle to facilitate sampler deployment and retrieval, and a check valve (flutter valve) in the headpiece.

Direct-push technology (DPT): Investigation tools that drive or push small-diameter rods and tools (typically not exceeding 4 inches in diameter) into the subsurface by hydraulic or percussive methods. Geoprobe Systems is a manufacturer of DPT equipment, and its brand name is often used interchangeably with "DPT."

EnCore Sampler: A disposable volumetric sampling device. It comes in sample sizes of 5 and 25 grams. It is a hermetically sealed, single-use soil sampler made from a high-tech, inert polymer. EnCore samplers are used to collect soil samples with zero headspace, as required for volatile organic compound (VOC) analysis (including purgeable total petroleum hydrocarbons). Each sample is collected using a reusable "T" handle.

Grab Sample: A sample collected from a discrete location or depth.

Hand Auger: An instrument attached to the bottom of a length of pipe that has a crossarm or "T" handle at the top. The auger can be closed-spiral or open-spiral.

Spatulas or Spoons: Stainless steel or disposable instruments for collecting loose unconsolidated material.

Split-Spoon (or Split-Barrel) Sampler: A thick-walled steel tube that is split lengthwise. A cutting shoe is attached to the lower end; the upper end contains a check valve and is connected to drill rods.

Terra Core Sampler: A disposable volumetric sampling device. It comes in sample sizes of 5 and 10 grams and is part of a sampling kit. It is a single-use sampler used to collect soil samples with zero headspace, as required for VOCs. Each sample is collected with the disposable coring device. However, unlike the EnCore sampler, the sample is placed directly into a 40-milliliter (mL) glass volatile organics analysis (VOA) vial after the soil is collected. The VOA vial is included in the sampling kit.

Thin-Wall Tube Sampler: A steel tube (1 to 3 millimeters thick) with a tapered bottom edge for cutting. The upper end is fastened to a check valve that is attached to drill rods.

Trier: A tube cut in half lengthwise with a sharpened tip that allows for collecting sticky solids or loosening cohesive soils.

Trowel: A metal or disposable tool with a scooped blade 4 to 8 inches long and 2 to 3 inches wide with a handle.

VOA Plunger: A disposable, plastic, single-use soil device to collect samples for analysis of VOCs.

1.4 REFERENCES

ASTM International (ASTM). D1452-09, Standard Practice for Soil Exploration and Sampling by Auger Borings, West Conshohocken, PA. 2009.

ASTM D1586-11, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils, ASTM International, West Conshohocken, PA. 2011.

ASTM D1587-08, Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes, ASTM International, West Conshohocken, PA. 2012.

ASTM D2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM International, West Conshohocken, PA. 2009.

ASTM D4220 / D4220M-14, Standard Practices for Preserving and Transporting Soil Samples, ASTM International, West Conshohocken, PA. 2014.

ASTM D4700-91, Standard Guide for Soil Sampling from the Vadose Zone, West Conshohocken, PA. 2006.

ASTM D6151-08, Standard Practice for Using Hollow-Stem Augers for Geotechnical Exploration and Soil Sampling, ASTM International, West Conshohocken, PA. 2008.

ASTM D6286-12, Standard Guide for Selection of Drilling Methods for Environmental Site Characterization, ASTM International, West Conshohocken, PA. 2012.

ASTM D6282 / D6282M-14, Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations, ASTM International, West Conshohocken, PA. 2014.

ASTM D6640-01 (2015), Standard Practice for Collection and Handling of Soils Obtained in Core Barrel Samplers for Environmental Investigations, ASTM International, West Conshohocken, PA. 2015.

ASTM D6907-05 (2010), Standard Practice for Sampling Soils and Contaminated Media with Hand-Operated Bucket Augers, ASTM International, West Conshohocken, PA. 2010.

U.S. Environmental Protection Agency (EPA). 1980. Samplers and Sampling Procedures for Hazardous Waste Streams. EPA/600/2-80/018. January.

EPA. 1987. A Compendium of Superfund Field Operations Methods. OSWER Directive 9355.0-14 EPA/540/P-87/001.

EPA. 1989. Soil Sampling Quality Assurance Users Guide; Second Edition. EPA/600/8-89/046. March.

EPA. 1991. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. EPA/600/4-89/034. March.

EPA. 1992. Preparation of Soil Sampling Protocol: Techniques and Strategies. EPA/600/SR-92/128.

EPA. 2001a. Soil Sampling. Environmental Response Team SOP #2012 (Rev. #1.0, 07/11/01) https://response.epa.gov/sites/2107/files/2012-r10.pdf

EPA. 2001b. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual. November. https://www.orau.org/ptp/PTP%20Library/library/EPA/samplings/eisopqam.pdf

EPA. 2002. Method 5035A (SW-846): Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples, Draft Revision 1. https://www.epa.gov/sites/production/files/2015-12/documents/5035a_r1.pdf

EPA. 2014. Sampler's Guide, Contract Laboratory Program Guidance for Field Samplers. EPA/540/R-104/013. October. https://www.epa.gov/sites/production/files/2015-03/documents/samplers_guide.pdf

1.5 REQUIREMENTS AND RESOURCES

Soil sampling requires the use of one or more of the following types of equipment:

- Spoon and spatula
- Trowel
- Shovel or spade
- Trier
- Core sampler
- EnCore sampler

Unified Soil Classification System (USCS, ASTM D2488-09a), should be recorded. Field tests such as head-space analysis can also be conducted using a photoionization detector or a flame ionization detector before samples are collected for chemical or physical analysis.

Soil samples for chemical analysis can be collected either as grab samples or as composite samples. A grab sample is collected from a discrete location or depth. A composite sample consists of soil combined from more than one discrete location. Typically, composite samples consist of soil obtained from several locations and homogenized in a stainless steel or Teflon bowl, tray, or plastic bag. Refer to the site-specific QAPP for the methodology for composite sample collection. Samples for VOC analysis should not be composited.

All non-disposable equipment used for soil sampling should be decontaminated between sampling locations in accordance with SOP 026, General Equipment Decontamination.

2.1 SOIL SAMPLE COLLECTION PROCEDURES

Soil samples can be collected as discrete samples for VOC analysis using specialized equipment for preservation in the laboratory or in the field. Samples for VOC analysis should not be composited. Soil samples collected for non-VOC analysis can be collected as either grab or composite samples using standard equipment.

2.1.1 Procedure for Preserving and Collecting Soil Samples for VOC Analysis

Samples collected for VOC analysis using traditional methods, such as collection in ajar with no preservation, are shown to yield non-representative results based on loss of VOCs. Samples can be preserved with methanol or sodium bisulfite to reduce volatilization and biodegradation to minimize loss of VOCs. However, these preservatives are not compatible with all VOCs; refer to the unique requirements in the project-specific QAPP or work plan. Preservatives may be added to containers by the laboratory before samples are collected, or preservatives may be added in the field. Alternatively, samples may be collected directly using devices like the EnCore sampler, which minimizes soil contact with the atmosphere. The specific sampling methodology will be identified in the project-specific QAPP or work

plan. Be aware that other methods of sample preservation (such as freezing) are available (EPA 2014), but are not detailed in this SOP.

Soil samples to be preserved in the laboratory are collected using SW-846 Method 5035A (EPA 2002). For samples preserved in the field, laboratories may perform low-level analysis (sodium bisulfate preservation) or high- to medium-level analysis (methanol preservation), depending on the project-specific QAPP.

The following procedures outline the steps necessary for collecting soil samples to be preserved at the laboratory and for collecting soil samples to be preserved in the field with methanol or sodium bisulfate.

2.1.1.1 Soil Samples to be Preserved at the Laboratory

EnCore Sampler

Soil samples collected for VOC analysis that are to be preserved at the laboratory may be obtained using a hand-operated, hermetically sealed sample vial such as an EnCore sampler. Each sample is collected using a reusable sampling handle ("T" handle) that can be provided with the EnCore sampler when it is requested and purchased. Collect the soil sample in the following manner for each EnCore sampler.

The EnCore sampler is loaded into the "T" handle with the plunger fully depressed. Press the "T" handle into the soil to be sampled. The plunger will be forced upward as the cavity fills with soil. When the sampler is full, rotate the plunger and lock it into place using the "T" handle. If the plunger does not lock, then it is not filled with soil. Soft soil may require several plunges or soil may be forced against a hard surface such as a decontaminated sample trowel to ensure headspace has been eliminated. Remove soil from the outside of the sampler so a tight seal can be made between the sample cap and the O-ring. With soil slightly piled above the rim of the sampler, force the cap on until the catches hook the side of the sampler. Remove any surface soil from outside of the sampler and place the sampler in the foil bag provided with the sampler. Seal the bag and label it with sample location information. Typically, collect three EnCore samplers per sample location. Decontaminate the "T" handle between sample locations.

Using the EnCore sampler eliminates the need for field preservation and the shipping restrictions associated with preservatives. A complete set of instructions is included with each EnCore sampler.

After the EnCore samples are collected, they should be placed on ice immediately and delivered to the laboratory within 48 hours. The samples must be preserved by the laboratory within 48 hours after they are collected.

Terra Core Sampler

New sampling collection equipment such as Terra Core have been developed to compete with EnCore when samples are collected for VOC analysis. Depending on the laboratory conducting the analysis, one of these two common VOC sampling devices may be used. In the case that Terra Core samplers are provided, collect the soil sample in the following manner.

Each Terra Core sampling kit comes with one Terra Core sampler that collects either a 5- or a 10-gram aliquot into multiple containers: one methanol-preserved 40 mL VOA vial for high-level analysis, two 40-mL VOA vials containing stir bars for undiluted/low-level analysis, and one 60-gram sample jar for percent moisture analysis. To collect a sample, with the plunger seated in the handle, push the sampler into freshly exposed soil until the sample chamber is filled. Wipe any excess soil and debris from the exterior of the sampler and remove any soil that extends beyond the mouth of the sampler. Then, rotate the plunger that was seated in the handler top 90 degrees until it aligns with the slots in the body. Place the mouth of the sampler into the desired 40 mL VOA vial and extrude the sample by pushing the plunger down. Quickly place the lid back on the VOA vial. After all vials provided have been filled, the sampler is now contaminated and must be disposed of unless additional, bulk sampling will be conducted.

After the Terra Core samples are collected, they should be placed on ice immediately and delivered to the laboratory within 48 hours. The samples must be preserved by the laboratory within 48 hours after they are collected. Because the vials are pre-weighed, no additional labels should be added. Sampling information should be written directly on the label already on the vial.

2.1.1.2 Soil Samples to be Preserved in the Field

Soil samples preserved in the field may be prepared for analysis using both the low-level (sodium bisulfate preservation) and the high- to medium-level (methanol preservation) methods. If samples effervesce when they are placed in preservative, it is necessary to collect a sample unpreserved, in deionized water. In

addition, an unpreserved sample for determination of moisture content must also be collected when soil samples to be preserved in the field are collected.

Methanol Preservation (High to Medium Level). Bottles may be pre-spiked with methanol in the laboratory or prepared in the field. Use 40- to 60-mL glass vials with septum-lined lids for soil samples to be preserved in the field with methanol. Fill each sample bottle with 25 mL of demonstrated analyte-free purge-and-trap grade 3 methanol. The preferred method for adding methanol to the sample bottle is by removing the lid and using a pipette or scaled syringe to add the methanol directly to the bottle.

Use a decontaminated (or disposable), small-diameter coring device such as a disposable VOA plunger to collect the soil. The outside diameter of the coring device must be smaller than the inside of the sample bottle neck. To collect the sample, pull the plunger back to the required location, insert it into the soil to be sampled, push the coring device into the soil, extrude the soil sample into the methanol-preserved sample bottle, and cap the bottle tightly. Swirl the sample (do not shake) in the methanol to break up the soil such that all of the soil is covered with methanol. After the samples are collected, place them on ice immediately and deliver to the laboratory within 48 hours.

Sodium Bisulfate Preservation (Low Level). Bottles may be prepared in the laboratory or in the field with sodium bisulfate solution. Samples to be preserved in the field using sodium bisulfate are collected using the same procedures described for methanol preservation.

2.1.2 Procedure for Collecting Soil Samples for Non-VOC Analysis

Samples collected for non-VOC analysis may be either grab or composite samples as follows. When collecting a grab sample, transfer a portion of soil to be analyzed to a stainless-steel or Teflon bowl, disposable inert plastic tray, or plastic bag. Avoid or remove vegetation and small stones. When a composite sample is collected, collect four to five discrete soil samples of roughly equal volume, based on the sample design in the QAPP. Remove roots, vegetation, sticks, and stones larger than the size of pea gravel (about $^1/_4$- to $^1/_2$-inch diameter). Thoroughly mix the soil with a stainless-steel spoon to obtain as uniform a texture and color as practicable. Transfer the mixed soil to the appropriate sample containers and close the containers. Label the sample containers and immediately place on ice.

2.2 TEST PIT AND TRENCH SOIL SAMPLING

Test pit and trench soil samples are collected when a complete soil profile is required or as a means of locating visually detectable contamination. This type of sampling provides a detailed description of the soil profile and allows for multiple samples to be collected from specific soil horizons. The sampling team should ensure that the sampling area is clear of utility lines, subsurface pipes, and poles before any test pit or trench is excavated with a backhoe.

A test pit or trench is excavated by incrementally removing soil with a backhoe bucket. The excavated soil is placed on plastic sheeting well away from the edge of the test pit. A test pit should not be excavated to depths greater than 4 feet unless its walls are properly sloped or stabilized. No personnel may enter any test pit or trench excavation more than 4 feet deep; such action would constitute confined space entry and must conform with Occupational Safety and Health Administration (OSHA) regulations at Title 29 of the *Code ofFederal Regulations* § 1910.

Personnel entering the test pit may be exposed to toxic or explosive gases and oxygen deficient environments. Air monitoring is required before they may enter the test pit, and use of appropriate respiratory gear and protective clothing is mandatory. At least two persons must be present at the test pit before sampling personnel may enter the excavation and begin soil sampling. Refer to project-specific health and safety plans for required safety procedures for excavations.

Soil samples can also be obtained directly from the backhoe bucket or from the excavated material after it has been removed and deposited on plastic sheeting. The sampling personnel may direct the backhoe excavator to obtain material from the selected depth and location within the excavation. The backhoe operator will set the backhoe bucket on the ground in a designated location, at a sufficient distance from the excavation to allow the sampler safe access to the bucket. The backhoe operator must disengage the controls and signal to the sampler that it is safe to approach the bucket. Collect the soil sample from the center of the backhoe bucket to reduce the potential for cross-contamination of the sample.

Test pits are not practical for sampling at depths greater than 15 feet. If soil samples are required from depths greater than 15 feet, samples should be obtained using test borings instead of test pits. Test pits are

also usually limited to a few feet below the water table. In some cases, a pumping system may be required to control the water level within the pits.

Access to open test pits should be restricted by flagging, tape, or fencing. If a fence is used, it should be erected at least 6 feet from the perimeter of the test pit. The test pit should be backfilled as soon as possible after sampling is completed.

Various equipment may be used to collect soil samples from the walls or bottom of a test pit. A hand auger, bucket auger, or core sampler can be used to obtain samples from various depths. A trier, trowel, EnCore sampler, Terra Core sampler, VOA plunger, or spoon can be used to obtain samples from the walls or pit bottom surface.

2.3 SURFACE SOIL SAMPLING

Surface soil samples can be used to investigate contaminants that exist in the near-surface environment. Contaminants detected in the near-surface environment may extend to considerable depths, potentially migrating to groundwater, surface water, the atmosphere, or biological systems. Sampling depths for surface soil are typically those that can be reached without use of a drill rig, DPT, or other mechanized equipment. Sample depths typically extend up to 1 foot below ground surface (bgs). However, the definition of "surface soil" and the resultant sample depths may vary based on risk assessment or other project requirements. Be aware of these site-specific constraints and follow the requirements of the QAPP to select the depths for surface soil samples.

2.3.1 Surface Soil Sampling Equipment

The surface soil sampling equipment presented in this SOP is best suited for sampling to depths of 0 to 6 feet bgs. The sample depth, analytical suite, soil type, and soil moisture will also dictate the most suitable sampling equipment. The sampling locations should be cleared of any surface debris such as twigs, rocks, and litter before samples are collected. The following table presents various surface soil sampling equipment and their effective depth ranges, operating means (manual or power), and sample types collected (disturbed or undisturbed).

Sampling Equipment	Effective Depth Range (feet below ground surface)	Operating Means	Sample Type
Hand Auger	0 to 6	Manual	Disturbed
Bucket Auger	0 to 4	Power	Disturbed
Core Sampler	0 to 4	Manual or Power	Undisturbed
EnCore or Terra Core Sampler	Not Applicable	Manual	Disturbed
Spoon/Spatula	0 to 0.5	Manual	Disturbed
Trowel	0 to 1	Manual	Disturbed
Volatile Organic Analysis (VOA) Plunger	Not Applicable	Manual	Disturbed

The procedures for using these various types of sampling equipment are discussed below.

2.3.1.1 Hand Auger

A hand auger equipped with extensions and a "T" handle is used to obtain samples from depths of up to 6 feet bgs. It is possible to hand auger deeper than 6 feet. However, hand-augering below this depth is uncommon because of the time, effort, and cost effectiveness when sampling to depths greater than 6 feet bgs. If necessary, a shovel may be used to excavate the topsoil to reach the desired subsoil level. If topsoil is removed, its thickness should be recorded. Samples obtained using a hand auger are disturbed in their collection; establishing the exact depth where samples are obtained is difficult.

The hand auger is screwed into the soil at an angle of 45 to 90 degrees from horizontal. When the entire auger blade has penetrated the soil, the auger is removed from the soil by lifting it straight up without turning it, if possible. If the desired sampling depth has not been reached, the soil is removed from the auger and deposited onto plastic sheeting. This procedure is repeated until the desired depth is reached and the soil sample is obtained. The auger is then removed from the boring and the soil sample is collected directly from the auger into an appropriate sample container.

2.3.1.2 Bucket Auger

A bucket auger, similar to the hand auger, is used to obtain disturbed samples from depths of up to 4 feet bgs. A bucket auger should be used when stony or dense soil is sampled that prohibits the use of a hand-operated core or screw auger. A bucket auger with closed blades is used in soil that cannot generally be penetrated or retrieved by a core sampler.

The bucket auger is rotated while downward pressure is exerted until the bucket is full. The bucket is then removed from the boring, the soil collected is placed on plastic sheeting, and this procedure is repeated until the appropriate depth is reached and a sample is obtained. The bucket is then removed from the boring and the soil sample is transferred from the bucket to an appropriate sample container.

2.3.1.3 Core Sampler

A hand-operated core sampler (Figure 1), similar to the hand auger, is used to obtain samples from depths of up to 4 feet bgs in uncompacted soil. The core sampler is capable of retrieving undisturbed soil samples and is appropriate when low concentrations of metals or organics are of concern. The core sampler should be constructed of stainless steel. A polypropylene core sampler is generally not suitable for sampling dense soils or sampling at greater depths.

The core sampler is pressed or driven (for example, using a slide hammer) into the soil at an angle of 45 to 90 degrees from horizontal and is rotated when the desired depth is reached. The core is then removed, and the sample is placed into an appropriate sample container.

2.3.1.4 Shovel

A shovel or spade may be used to obtain large quantities of soil that are not readily obtained with a trowel. A shovel is used when soil samples from depths of up to 6 feet bgs are to be collected by hand excavation; a tiling spade (sharpshooter) is recommended for excavation and sampling. A standard steel shovel may be used for excavation; either a stainless-steel or polypropylene shovel may be used for sampling. Soil excavated from above the desired sampling depth should be stockpiled on plastic sheeting. Soil samples should be collected from the shovel and placed into the sample container using a stainless-steel scoop, plastic spoon, or other appropriate tool.

2.3.1.5 Trier

A trier (Figure 2) is used to sample soil from depths up to 1 foot bgs. A trier should be made of stainless steel or polypropylene. A chrome-plated steel trier may be suitable when samples are to be analyzed for organics and heavy metal content is not a concern.

Samples are obtained by inserting the trier into soil at an angle of up to 45 degrees from horizontal. The trier is rotated to cut a core and is then pulled from the soil being sampled. The sample is then transferred to an appropriate sample container.

2.3.1.6 Trowel

A trowel is used to obtain surface soil samples that do not require excavation beyond a depth of 1 foot. A trowel may also be used to collect soil subsamples from profiles exposed in test pits. Use of a trowel is practical when sample volumes of approximately 1 pint (0.5 liter) or less are to be obtained. Excess soil should be placed on plastic sheeting until sampling is completed. A trowel should be made of stainless or galvanized steel. It can be purchased from a hardware or garden store. Soil samples to be analyzed for organics should be collected using a stainless-steel trowel. Samples may be placed directly from the trowel into sample containers.

2.4 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling is accomplished in conjunction with borehole drilling for depths greater than approximately 6 feet bgs. Subsurface soil sampling is frequently coupled with exploratory boreholes or monitoring well installation. As described above for surface soil, the definition of “subsurface soil” may vary based on risk assessment or other project requirements. Be aware of site-specific constraints and follow the requirements of the QAPP to select the depths for subsurface soil samples.

2.4.1 Subsurface Soil Sampling Equipment and Methods

Subsurface soil may be sampled using a drilling rig, power auger, or DPT. Selection of sampling equipment depends on geologic conditions and the scope of the sampling program. Two types of samplers

used with machine-driven augers — the split-spoon sampler and the thin-wall tube sampler — are discussed below. All sampling tools should be cleaned before and after each use in accordance with SOP 026, General Equipment Decontamination. Both the split-spoon sampler and the thin-wall tube sampler can be used to collect undisturbed samples from unconsolidated soils. The procedures for DPT sampling are also presented below.

2.4.1.1 Split-Spoon Sampler

Split-spoon samplers are available in a variety of types and sizes. Site conditions and project needs, such as large sample volume for multiple analyses, dictate the specific type of split-spoon sampler to be used. Figure 3 shows a generic split-spoon sampler.

The split-spoon sampler is advanced into the undisturbed soil beneath the bottom of the casing or borehole using a weighted hammer and a drill rod. The relationship between hammer weight, hammer drop, and number of blows required to advance the split-spoon sampler in 6-inch increments indicates the density or consistency of the subsurface soil. After the split-spoon sampler has been driven to its intended depth, it should be removed carefully to avoid loss of sample material. A catcher or basket should be used to help retain the sample in non-cohesive or saturated soil.

After the split-spoon sampler is removed from the casing, it is detached from the drill rod and opened. If VOA samples are to be collected, EnCore samplers, Terra Core samplers, or VOA plungers should be filled with soil taken directly from the split-spoon sampler. Samples for other specific chemical analyses should be taken as soon as the VOA sample has been collected. The remainder of the soil recovered can then be used for visual classification of the sample and containerized for physical analysis. The entire sample (except for the top several inches of possibly disturbed material) is retained for analysis or disposal.

2.4.1.2 Thin-Wall Tube Sampler

A thin-wall tube sampler, sometimes called the Shelby tube (Figure 4), is used to collect soil samples for geophysical analysis. Tube samplers are best suited for collecting cohesive soils such as clays and silts. The tube sampler may be pressed or driven into soil inside a hollow-stem auger flight, wash bore casing, or uncased borehole. The tube sampler is pressed into the soil, without rotation, to the desired depth or until

it meets refusal. If the tube cannot be advanced by pushing, it may be necessary to drive it into the soil without rotation using a hammer and drill rod. The tube sampler is then rotated to collect the sample from the soil and removed from the borehole.

After the tube sampler is removed from the drilling equipment, the tube sampler should be inspected for adequate sample recovery. The sampling procedure should be repeated until an adequate soil core is obtained (if the tube sampler can retain the sample material). The soil core obtained should be documented in the logbook. Any disturbed soil is removed from each end of the tube sampler. If chemical analysis is required, VOA samples must be collected immediately after the tube sampler is withdrawn. EnCore samplers, Terra Core samplers, or VOA plungers should be filled with soil taken directly from the tube sampler. Before use, and during storage and transport, the tube sampler should be capped with a non-reactive material. The tube is sealed using plastic caps for physical sampling parameters. The top and bottom of the tube sampler should be labeled and the tube sampler should be stored accordingly.

2.4.1.3 Direct-Push Technology Methods

In many cases, DPT is less expensive and faster than collecting soil samples with a standard drilling rig. In addition, the use of DPT causes minimal disturbance to the ground surface and generates little to no soil cuttings. DPT drill rigs, as well as traditional drill rigs, often use acetate or clear polyvinyl chloride sleeves or brass liners inside of split-spoon or thin-wall tube samplers for collecting soil samples.

The sample sleeve is extruded from the sampling rod when the sampling rod is retrieved from the ground. The sleeve is sliced lengthwise twice to open the sleeve. Soil samples can be collected directly from the opened sleeve. EnCore samplers, Terra Core samplers, or VOA plungers should be filled with soil taken directly from the opened DPT sampler if VOA samples are to be collected. Samples for other specific chemical analysis should be collected after the VOA sample. The remainder of the recovered soil can then be used for visual classification of the sample and containerized for physical analysis. The entire sample is retained for analysis or disposal.

FIGURE 1

HAND-OPERATED CORE SAMPLER

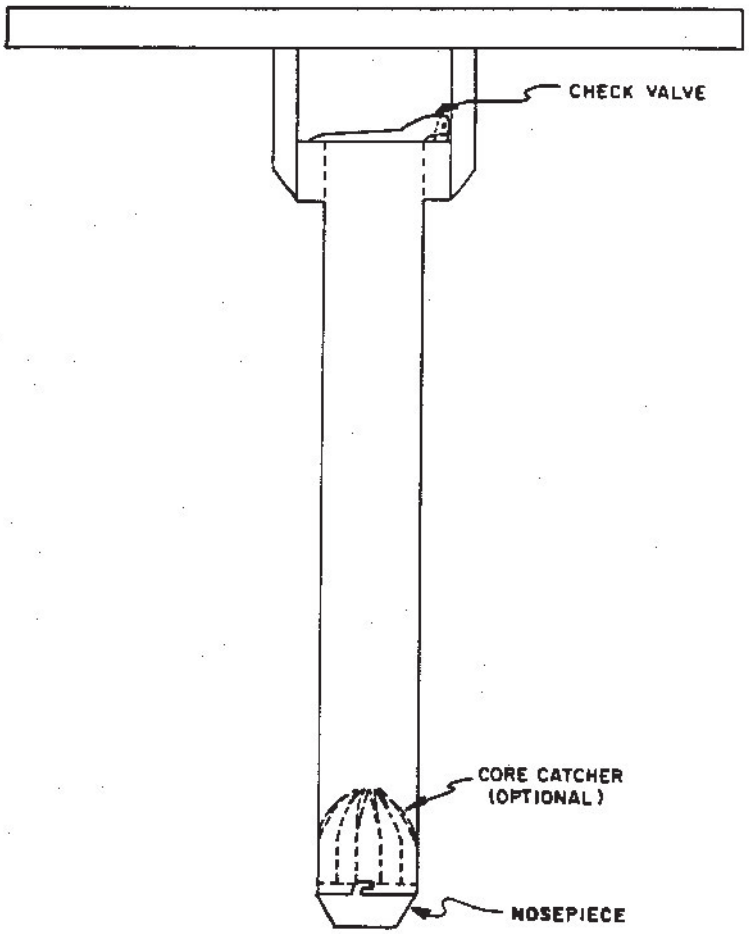


FIGURE 2

TRIER

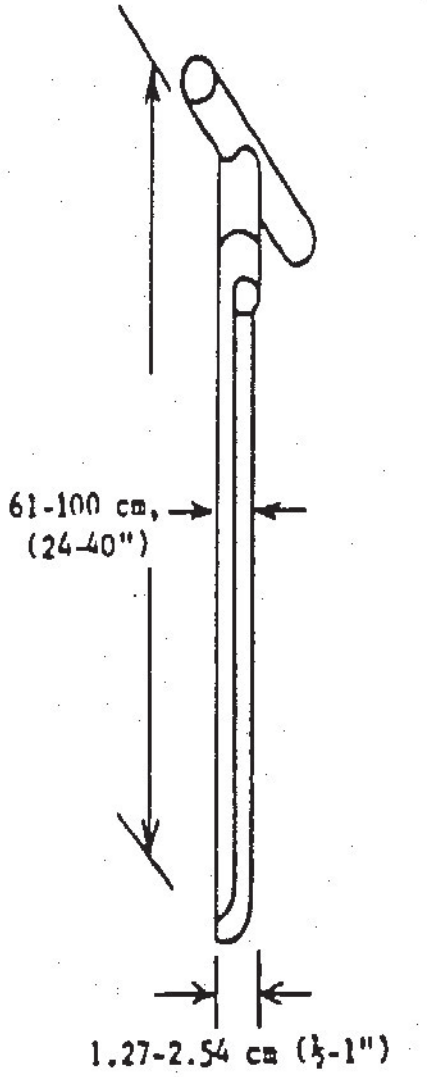


FIGURE 3

GENERIC SPLIT-SPOON SAMPLER

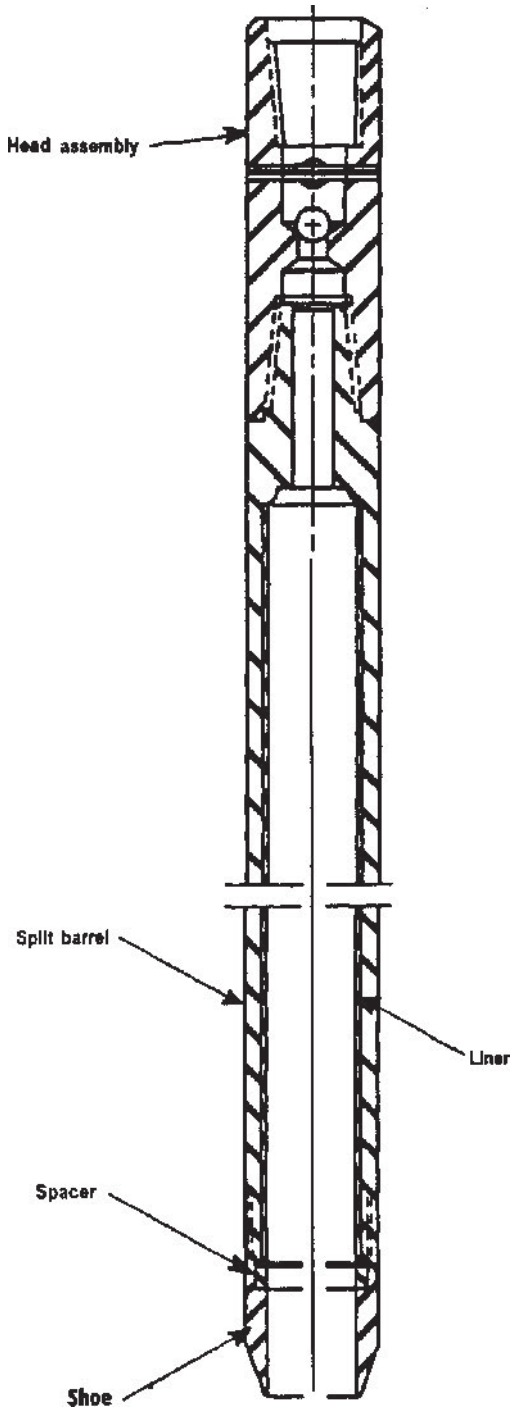
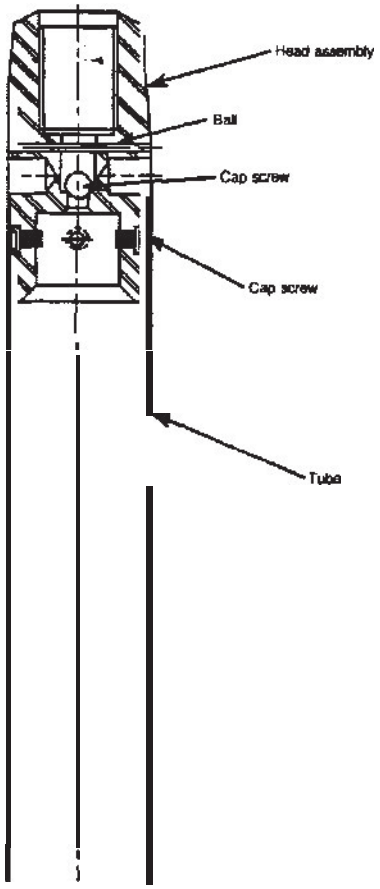


FIGURE 4

THIN-WALL TUBE SAMPLER



1. PURPOSE

The purpose of this procedure is to describe and classify soil samples in the field during soil boring advancement.

2. PROCEDURE

2.1 FIELD PREPARATION

Call Miss Dig (1-800-482-7171 or 811) at least 72 hours in advance to arrange utility staking in any subsurface
boring or exploration area.
Notify client, property owner, and MDEQ if necessary.

2.1.1 Forms

Soil Boring and Monitoring Well Logs
Tailgate Health and Safety
Field Service Request
Daily Report Sheets

2.1.2 Equipment

- Knife or spatula
- Ruler, tape measure, or scale
- Latex or nitrile gloves
- Sand gauge and geotechnical gauge, if necessary

2.1.3 Documents

Health and Safety Plan; Workplan; Maps Site, Access agreements

2.1.4 Other

Cellular telephone; First aid kit Personal comfort items; Daily Field Forms or Logbook

2.2 FIELD ACTIVITIES

Include the following information in the soil sample description: color (including mottling); moisture; density; major and minor soil types; content and grain sizes; and other additional descriptors including contaminant observations; bedding and lamination. Particle shape or angularity are also useful for coarse-grained materials.

Record these descriptors in the following order: 1) color, 2) moisture content, 3) density, 4) composition and grain sizes, and 5) other descriptors.

1) **Color:** Use best judgment in describing soil color. Munsell color charts may be used on specific projects if required. Observed mottling should also be reported, as an "other" descriptor at the end of the description. Be sure to include corresponding quantity and contrast terms and specify the mottled colors.
Mottling:

Contrast Term	Description
Faint	indistinct
Distinct	easily seen
Prominent	outstanding

2) Moisture content:

Dry	Little or no perceptible moisture
Damp	Some perceptible moisture, not compactable
Moist	Compactable
Wet	Above compactable range
Saturated	Pores, voids filled with water (note: compressed, structureless clay does not "saturate," as filled micropores in clay soil will not drain with gravity due to capillarity/cohesion)

0) Density, based upon blow counts:

		Silt or Clay	Blows per foot	Thumb Penetration
Very loose	0 - 4	Very soft	0 - 2	Very easily
Loose	4 - 10	Soft	2 - 4	Easily
Medium dense	10 - 30	Medium stiff	4 - 8	Moderate effort
Dense	30 - 50	Stiff	8 - 15	Indented easily
Very dense	>50	Very stiff	15 - 30	Indented by nail
		Hard	>30	Difficult by nail

3) Content and grain size (Unified Soil Classification System (USCS)):

5) **Additional descriptors, such as**

Bedding and laminations

Term	Thickness (feet/meters)
Very Thickly Bedded	> 3.3’ (1 m)
Thickly Bedded	1’- 3.3’ (30 - 100 cm)
Medium Bedded	4” - 1’ (10 - 30 cm)
Thinly Bedded	1” - 4” (3 - 10 cm)
Very Thinly Bedded	0.4” - 1” (1 - 3 cm)
Thickly Laminated	0.12” - 0.4” (0.1 - 1 cm)
Thinly Laminated	<0.12” (<0.3 cm)

Descriptive terms:

Lens	Zone equal to or less than 1-inch (2.5 cm) in thickness
Layer	Zone greater than 1-inch (2.5 cm) in thickness
Interbedded	Alternating lenses and/or layers of different media types
Pockets	Inclusion of one media type in a matrix of another media type

Examples of soil descriptions:
Fine to coarse **SAND**, and medium to coarse **GRAVEL**
Fine **GRAVEL**, some fine to coarse Sand, little Silt, trace Clay
Medium to coarse **SAND**, trace fine Gravel, trace fine Sand
Gray, wet, medium dense, fine to coarse **SAND**, some fine Gravel
Brown with distinct gray mottling, moist, soft, interbedded **SILT** and **CLAY**, trace fine Sand, very thinly bedded.

Notes:
-Always use capital letters for primary constituents, or both primary constituents if you use “and”. The first letter of each subsequent component of soil content is capitalized.
-Describe grain size small to large (ex. fine to coarse Gravel).
-Within one percentage category, list in decreasing grain-size (ex. trace fine Gravel, trace fine Sand).

1.0 BACKGROUND

The chemical characterization of soil samples in the field will be determined by a field portable X-ray fluorescence (XRF). The instrument uses low level self-contained and shielded radioactive sources that produce spectral peaks whose position (energy level) is specific to an individual element and whose peak height or area which is indicative of the concentration of that element within the area exposed to the source.

The detection limit for each parameter is a function of source strength, geometry/particle size, counting time, and the concentration of other elements. Since the source strength and instrument geometry are constants, the detection limit is dependent on geometry/particle size, counting time, and concentration. It has been demonstrated that 80 mesh particle size dominantly composed of a siliceous or calcareous skeletal matrix will give analytical results within 20 percent. The larger the particle size, the larger the error. A rock made up of fine-grained minerals, however, will essentially have the same precision and accuracy as a finely ground sample.

2.0 PROCEDURES

Soil samples will be screened and all particles greater than 2 mm (No. 10 sieve) will be removed.

The counting time also affects the detection limit. In general, the longer the counting time, the lower the detection limit, and certainly the higher the precision and accuracy. The instrument has controllable time units of 10, 30, 100, 300, and manual control seconds. The 30 second counting time will likely be the standard for this test. The time may change for either or both sources depending on the actual sample matrix encountered in the field.

The primary operator will receive one day's training on the proper use of the instrument particularly for health and safety purposes. The manufacturer's statement on radiation safety is also attached. Each operator will have a gamma film badge service (monthly) and will have the dates and times used logged in the record book specifically kept for this purpose.

Calibration of the unit will be provided by the following method.

The XRF will be calibrated before being taken in the field using a known calibration standard provided by the manufacturer. These splits will be used to develop the response curves so that the index values that are generated in the field can be converted into concentrations. These concentrations will then be used to help direct the soil sampling program for laboratory samples. The XRF will also be calibrated using the internal standards as recommended by the manufacturer. This internal calibration will be performed, each day of use, in the morning, at noon and at the end of the day. Time, temperature and calibration data will be noted during each calibration in the field logbook.

Data for select elements will be recorded in the field logbook or on standard forms.

To obtain the best quantitative XRF results, a uniform volume of soil material of generally the same particle size will be used. The sample should be prepared in the following manner: (1) Disaggregate and homogenize field moist sample, foreign objects such as rocks, twigs, roots, etc.; (2) Dry sample preferably overnight in an over set at approximately 105^{o}C; (3) Cool sample to room temperature; (4) Sieve sample through a 2 mm nonmetallic sieve; (5) homogenize sieved sample; and, (6) Place sample in a 2-inch petri dish.

The soil material will be well packed in the petri dish and the top surface should be uniformly smoothed to the level of the petri dish edges. The head of the XRF should then be placed over the petri dish.

If soil is sticking to the XRF, place a piece of Saran Wrap over the petri dish. If any dust sticks to the head of the XRF, clean it with a fine-bristle paint brush.

1.0 BACKGROUND

All non-disposable field equipment must be decontaminated before and after each use at each sampling location to obtain representative samples and to reduce the possibility of cross-contamination.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for decontaminating equipment in the field.

1.2 SCOPE

This SOP applies to decontaminating general non-disposable field equipment. To prevent contamination of samples, all sampling equipment must be thoroughly cleaned prior to each use.

1.3 DEFINITIONS

Alconox: Non-phosphate soap, obtained in powder detergent form and dissolved in water **Liquinox:** Non-phosphate soap, obtained in liquid form for mixing with water

1.4 REFERENCES

U.S. Environmental Protection Agency (EPA). 1992a. "Guide to Management of Investigation-Derived Wastes." Office of Solid Waste and Emergency Response. Washington D.C. EPA 9345.3-03FS. January.

EPA. 1992b. "RCRA Ground-Water Monitoring: Draft Technical Guidance." Office of Solid Waste. Washington, DC. EPA/530-R-93-001. November.

EPA. 1994. "Sampling Equipment Decontamination." Environmental Response Team SOP #2006 (Rev. #0.0, 08/11/94). http://www.ert.org/mainContent.asp?section=Products&subsection=List

1.5 REQUIREMENTS AND RESOURCES

The equipment required to conduct decontamination is as follows:

- Scrub brushes
- Large wash tubs or buckets
- Squirt bottles
- Alconox or Liquinox
- Tap water
- Distilled water
- Plastic sheeting
- Aluminum foil
- Methanol or hexane
- Isopropanol (pesticide grade)
- Dilute (0.1 N) nitric acid

2.0 PROCEDURE

The procedures below discuss decontamination of personal protective equipment (PPE), drilling and monitoring well installation equipment, borehole soil sampling equipment, water level measurement equipment, general sampling equipment, and groundwater sampling equipment.

2.1 PERSONAL PROTECTIVE EQUIPMENT DECONTAMINATION

Personnel working in the field are required to follow specific procedures for decontamination prior to leaving the work area so that contamination is not spread off site or to clean areas. All used disposable protective clothing, such as Tyvek coveralls, gloves, and booties, will be containerized for later disposal. Decontamination water will be containerized in 55-gallon drums (refer to Section 3.0).

Personnel decontamination procedures will be as follows:

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.

2. Maintain the same level of personal protection as was used for sampling.

3. Wash neoprene boots (or neoprene boots with disposable booties) with Liquinox or Alconox solution and rinse with clean water. Remove booties and retain boots for subsequent reuse.

4. Wash outer gloves in Liquinox or Alconox solution and rinse in clean water. Remove outer gloves and place into plastic bag for disposal.

5. Remove Tyvek or coveralls. Containerize Tyvek for disposal and place coveralls in plastic bag for reuse.

6. Remove air purifying respirator (APR), if used, and place the spent filters into a plastic bag for disposal. Filters should be changed daily or sooner depending on use and application. Place respirator into a separate plastic bag after cleaning and disinfecting.

7. Remove disposable gloves and place them in plastic bag for disposal.

8. Thoroughly wash hands and face in clean water and soap.

2.2 DRILLING AND MONITORING WELL INSTALLATION EQUIPMENT DECONTAMINATION

All drilling equipment should be decontaminated at a designated location on site before drilling operations begin, between borings, and at completion of the project. Decontamination may be conducted on a temporary decontamination pad constructed at satellite locations within the site area in support of temporary work areas. The purpose of the decontamination pad is to contain wash waters and potentially contaminated soil generated during decontamination procedures. Decontamination pads may be constructed of concrete, wood, or plastic sheeting, depending on the site-specific needs and plans. Wash waters and contaminated soil generated during decontamination activities should be considered contaminated and thus, should be collected and containerized for proper disposal.

Monitoring well casing, screens, and fittings are assumed to be delivered to the site in a clean condition. However, they should be steam cleaned and placed on polyethylene sheeting on-site prior to placement downhole. The drilling subcontractor will typically furnish the steam cleaner and water.

The drilling auger, bits, drill pipe, any portion of drill rig that is over the borehole, temporary casing, surface casing, and other equipment used in or near the borehole should be decontaminated by the drilling subcontractor as follows:

1. Select an area removed from sampling locations that is both downwind and

downgradient. Decontamination must not cause cross-contamination between sampling points.

2. Maintain the same level of personal protection as was used for sampling.
3. Remove loose soil using shovels, scrapers, wire brush, etc.
4. Steam clean or pressure wash to remove all visible dirt.
5. If equipment has directly or indirectly contacted contaminated media and is known or suspected of being contaminated with oil, grease, polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), or other hard to remove organic materials, rinse equipment with pesticide-grade isopropanol.
6. To the extent possible, allow components to air dry.
7. Wrap or cover equipment in clear plastic until it is time to be used.
8. All wastewater from decontamination procedures should be containerized.

2.3 BOREHOLE SOIL SAMPLING DOWNHOLE EQUIPMENT DECONTAMINATION

All soil sampling downhole equipment should be decontaminated before use and after each sample as follows:

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.
2. Maintain the same level of personal protection as was used for sampling.
3. Prior to sampling, scrub the split-barrel sampler and sampling tools in a wash bucket or tub using a stiff, long bristle brush and Liquinox or Alconox solution.
4. After sampling, steam clean the sampling equipment over the rinsate tub and allow to air dry.
5. Place cleaned equipment in a clean area on plastic sheeting and wrap with aluminum foil.
6. Containerize all water and rinsate; disposable single-use sampling equipment should also be containerized.
7. Decontaminate all equipment placed down the hole as described for drilling equipment.

2.4 WATER LEVEL MEASUREMENT EQUIPMENT DECONTAMINATION

Field personnel should decontaminate the well sounder and interface probe before inserting and after removing them from each well. The following decontamination procedures should be used:

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.

2. Maintain the same level of personal protection as was used for sampling.

3. Wipe the tape and probe with a disposable Alconox- or Liquinox-impregnated cloth or paper towel.

4. If immiscible layers are encountered, the interface probe may require steam cleaning or washing with pesticide-grade isopropanol.

5. Rinse with deionized water.

2.5 GENERAL SAMPLING EQUIPMENT DECONTAMINATION

All non-disposable sampling equipment should be decontaminated using the following procedures:

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.

2. Maintain the same level of personal protection as was used for sampling.

3. To decontaminate a piece of equipment, use an Alconox wash; a tap water wash; a solvent (isopropanol, methanol, or hexane) rinse, if applicable, or dilute (0.1 N) nitric acid rinse, if applicable; a distilled water rinse; and air drying. Use a solvent (isopropanol, methanol, or hexane) rinse for grossly contaminated equipment (for example, equipment that is not readily cleaned by the Alconox wash). The dilute nitric acid rinse may be used if metals are the analyte of concern.

4. Place cleaned equipment in a clean area on plastic sheeting and wrap with aluminum foil.

5. Containerize all water and rinsate.

2.6 GROUNDWATER SAMPLING EQUIPMENT

The following procedures are to be employed for the decontamination of equipment used for groundwater sampling. Decontamination is not necessary when using disposable (single-use) pump

tubing or bailers. Bailer and downhole pumps and tubing decontamination procedures are described in the following sections.

2.6.1 Bailers

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.
2. Maintain the same level of personal protection as was used for sampling.
3. Evacuate any purge water in the bailer.
4. Scrub using soap and water and/or steam clean the outside of the bailer.
5. Insert the bailer into a clean container of soapy water. Thoroughly rinse the interior of the bailer with the soapy water. If possible, scrub the inside of the bailer with a scrub brush.
6. Remove the bailer from the container of soapy water.
7. Rinse the interior and exterior of the bailer using tap water.
8. If groundwater contains or is suspected to contain oil, grease, PAH, PCB, or other hard to remove organic materials, rinse equipment with pesticide-grade isopropanol.
9. Rinse the bailer interior and exterior with deionized water to rinse off the tap water and solvent residue, as applicable.
10. Drain residual deionized water to the extent possible.
11. Allow components to air dry.
12. Wrap the bailer in aluminum foil or a clean plastic bag for storage.
13. Containerize the decontamination wash waters for proper disposal.

2.6.2 Downhole Pumps and Tubing

1. Select an area removed from sampling locations that is both downwind and downgradient. Decontamination must not cause cross-contamination between sampling points.
2. Maintain the same level of personal protection as was used for sampling.
3. Evacuate any purge water in the pump and tubing.

4. Scrub using soap and water and/or steam clean the outside of the pump and, if applicable, the pump tubing.

5. Insert the pump and tubing into a clean container of soapy water. Pump/run a sufficient amount of soapy water to flush out any residual well water. After the pump and tubing are flushed, circulate soapy water through the pump and tubing to ensure that the internal components are thoroughly flushed.

6. Remove the pump and tubing from the container.

7. Rinse external pump components using tap water.

8. Insert the pump and tubing into a clean container of tap water. Pump/run a sufficient amount of tap water through the pump to evacuate all of the soapy water (until clear).

9. If groundwater contains or is suspected to contain oil, grease, PAH, PCB, or other hard to remove organic materials, rinse the pump and tubing with pesticide-grade isopropanol.

10. Rinse the pump and tubing with deionized water to flush out the tap water and solvent residue, as applicable.

11. Drain residual deionized water to the extent possible.

12. Allow components to air dry.

13. For submersible bladder pumps, disassemble the pump and wash the internal components with soap and water, rinse with tap water, isopropanol (if necessary), and deionized water, and allow to air dry.

14. Wrap pump and tubing in aluminum foil or a clean plastic bag for storage.

15. Containerize the decontamination wash waters for proper disposal.

3.0 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) can include disposable single-use PPE and sampling equipment, soil cuttings, and decontamination wash waters and sediments. Requirements for waste storage may differ from one facility to the next. Facility-specific directions for waste storage will be provided in project-specific documents, or separate direction will be provided by the project manager. The following guidelines are provided for general use:

1. Assume that all IDW generated from decontamination activities contains the hazardous chemicals associated with the site unless there are analytical or other data to the contrary.

Waste solution volumes could vary from a few gallons to several hundred gallons in cases where large equipment required cleaning.

2. Containerized waste rinse solutions are best stored in 55-gallon drums (or equivalent containers) that can be sealed until ultimate disposal at an approved facility.

3. Label IDW storage containers with the facility name and address, date, contents, company generating the waste, and an emergency contact name and phone number.

4. Temporarily store the IDW in a protected area that provides access to the containers and allows for spill/leak monitoring, sampling of containers, and removal following determination of the disposal method.

1.0 BACKGROUND

In any sampling program, the integrity of a sample must be ensured from its point of collection to its final disposition. This standard operating procedure (SOP) describes procedures for packaging and shipping samples. Steps in the procedures should be followed to ensure sample integrity and to protect the welfare of persons involved in shipping and receiving samples.

1.1 PURPOSE

This SOP establishes the requirements and procedures for packaging and shipping samples. It has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) "Contract Laboratory Program Guidance for Field Samplers." Procedures described in this SOP should be followed for all routine sample packaging and shipping. If procedures are to be modified for particular contract- or laboratory-specific requirements, modified procedures should be clearly described in site-specific plans such as work plans, field sampling plans (FSPs), or quality assurance project plans (QAPPs). Deviations from the procedures in this SOP must be documented in a field logbook. This SOP assumes that samples are already in the appropriate sample jars and that the sample jars are labeled.

This SOP does not cover the packaging and shipment of Dangerous Goods or Hazardous Materials. The shipment of Dangerous Goods (by air) and Hazardous Materials (by ground) requires specialized training. If you have NOT received this training in the last two years, you are NOT qualified to package or ship these materials and may be personally liable for any damages or fines. Contact one of Tetra Tech's shipping experts for assistance. Instructions to access the training course, shipping experts and health and safety (H&S) contacts, and general information on packaging and shipping hazardous substances and dangerous goods can be obtained by checking the links provided in Section 1.4 (References).

1.2 SCOPE

This SOP applies to packaging and shipping of environmental and non-hazardous samples. This SOP does not address shipping dangerous goods or hazardous materials.

1.3 DEFINITIONS

Airbill: An airbill is a shipping form (such as a FedEx shipping form) acquired from the commercial shipper and is used to document shipment of the samples from the sampler to the designated analytical laboratory (see Figure 1).

Custody-of-Custody form: A chain-of-custody form is used to document the transfer of custody of samples from the field to the designated analytical laboratory (see Figure 2). The chain-of-custody form is critical to the chain-of-custody process and is used to identify the samples in each shipping container to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis (see Figure 3).

Custody seal: A custody seal is a tape-like seal and is used to indicate that samples are intact and have not been disturbed during shipping or transport after the samples have been released from the sampler to the shipper (see Figure 4). The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packaged for shipping (see Figure 5).

Environmental samples: Environmental samples include drinking water, most groundwater and surface water, soil, sediment, treated municipal and industrial wastewater effluent, indoor and ambient air, non-hazardous bulk materials, soil gas, dust, asbestos, and biological specimens. Environmental samples typically contain low concentrations of contaminants and, when handled, require only limited precautionary procedures.

Field Blank: A field blank is any blank sample that is packaged and shipped from the field. Each field blank is assigned its own unique sample number. Field blanks include trip blanks, rinse blanks, and equipment blanks, all intended to assess potential cross-contamination. For example, a trip blank checks for contamination during sample handling, storage, and shipment from the field to the laboratory.

Non-hazardous samples: Non-hazardous samples are those samples that do not meet the definition of a hazardous sample and **do not** need to be packaged and shipped in accordance with the International Air Travel Association's (IATA's) "Dangerous Goods Regulations" (DGR) or U.S. Department of Transportation's (U.S. DOT's) "Hazardous Materials Regulations" (HMR) defined in Title 49 Code of Federal Regulations (CFR).

The following definitions are provided to further distinguish environmental and non-hazardous samples from dangerous good and hazardous samples:

Dangerous goods: Dangerous goods are articles or substances that can pose a significant risk to health, safety, or property when transported by air; they are classified as defined in Section 3 of the DGR (IATA 2014).

Hazardous samples: Hazardous samples include dangerous goods and hazardous substances. Hazardous samples shipped by air should be packaged and labeled in accordance with procedures specified by the DGR; ground shipments should be packaged and labeled in accordance with the HMR.

Hazardous substance: A hazardous substance is any material, including its mixtures and solutions, that is listed in 49 CFR 172.101 and its quantity, in one package, equals or exceeds the reportable quantity (RQ) listed in Table 1 to Appendix A of 49 CFR 172.101.

1.4 REFERENCES

General Awareness, H&S contacts, and course training information" click here. (Tetra Tech, Inc., EMI Operating Unit. Intranet) Available on-line at: https://int.tetratech.com/sites/EMI/hs/Pages/Dangerous-Goods-Shipping.aspx

International Air Transport Association (IATA). 2014. "Dangerous Goods Regulations. 2014." For sale at: http://www.iata.org/publications/Pages/standards-manuals.aspx. Updated annually, with new edition available late in year.

U.S. Environmental Protection Agency (EPA). 40 CFR, 763 Subpart F, Asbestos Hazards Emergency Response Act (AHERA).

EPA. 2011. "Contract Laboratory Program Guidance for Field Samplers." EPA 540-R-09-03. Available on-line at: http://www.epa.gov/oerrpage/superfund/programs/clp/download/sampler/CLPSamp-01-2011.pdf. January.

1.5 REQUIREMENTS AND RESOURCES

The procedures for packaging and shipping samples require the following:

- Coolers (insulated ice chest) or other shipping containers appropriate to sample type
- Ice
- Bubble wrap or similar cushioning material
- Chain-of-custody forms and seals

- Airbills
- Resealable plastic bags for sample jars and ice
- Tape (strapping and clear)
- Large plastic garbage bags for lining the cooler
- Temperature blank sample bottle filled with distilled water can be included in the cooler if appropriate to sample type

- Trip blank samples used to check for volatile contamination during sample handling in the field and shipment from field to laboratory should be included in the cooler if volatile organic compounds are requested for analysis. Also see Field Blank under definitions.

2.0 PROCEDURES

The following procedures apply to packaging and shipping non-hazardous and environmental samples.

2.1 PACKAGING SAMPLES

After they have been appropriately containerized and labeled, environmental samples should be packaged as described in this section. This section covers procedures for packing samples for delivery by commercial carrier (air or ground) and hand delivery of environmental samples (by employee or courier), as well as shipping asbestos and air quality samples. Note that these instructions are general; samplers also should be aware of client-specific requirements concerning the placement of custody seals or other packaging provisions.

2.1.1 Packaging Samples for Delivery by Commercial Carrier (Air or Ground)

Samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

Preparing the sample:

1. Allow a small amount of headspace in all bottles, or as instructed by the laboratory (except volatile organic compound [VOC] containers with a septum seal) to compensate for any changes in pressure and temperature during transfer.
2. Be sure the lids on all bottles are tight (will not leak). Lids maybe taped or sealed with custody seals as added protection or as required.
3. Place sample containers in resealable plastic bags.

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.
2. It is recommended that the cooler be lined with a large plastic garbage bag before samples, ice, and absorbent packing material are placed in the cooler.
3. Wrap the sample containers in bubble wrap or line the cooler (bottom and sides) with a cushioning material to prevent breakage of bottles or jars during shipment.
4. Add a sufficient quantity of ice to the cooler to cool samples to 4 °C (+ 2 °C). Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.
5. For volatile organic analysis (VOA) samples only, include one trip blank for VOA analysis per shipment matrix in each cooler.
6. Fill all remaining space between the bottles or jars with bubble wrap.
7. Securely fasten the top of the large garbage bag with tape (preferably plastic electrical tape).
8. If more than one cooler is being shipped, mark each cooler as “1 of 2,” “2 of 2,” and so forth.
9. Place the chain-of-custody forms (see Figure 2) into a resealable plastic bag, and tape the bag to the inner side of the cooler lid (see Figure 3). If you are shipping more than one cooler, copy the chain-of-custody form so that there is one copy of all forms in each cooler. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler. Tape any instructions for returning the cooler to the inside of the lid.
10. Close the lid of the cooler and tape it shut by wrapping strapping tape around both ends and hinges of the cooler at least once.
11. Place two signed custody seals (see Figure 4) on opposite sides of the cooler, ensuring that each one covers the cooler lid and side of the cooler (see Figure 5; note that in contrast to the figure, the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in Figure 5). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal.
12. Shipping containers must be marked "THIS END UP.” Arrow labels, which indicate the proper upward position of the container, may also be affixed to the container (see Figures 3 and 5). A label containing the name, phone number, and address of the shipper should be placed on the outside of the container (Federal Express [FedEx] label) (see Figure 1).
13. Ship samples overnight using a commercial carrier such as FedEx.

2.1.2 Hand Delivery of Environmental Samples (by Employee or Courier)

Samples hand-delivered to the laboratory should be packed for shipment using the following procedures:

Preparing the sample:

1. Bottles can be filled completely with sample (required for VOC containers with a septum seal).
2. Be sure the lids on all bottles are tight (will not leak).

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.

2. Wrap the sample containers in bubble wrap and/or line the cooler (bottom and sides).
3. Add a sufficient quantity of ice to the cooler to cool samples to 4 °C. Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.
4. For VOA samples only, include one trip blank for VOA analysis per shipment matrix in each cooler.
5. If more than one cooler is being shipped, mark each cooler as “1 of 2,” “2 of 2,”and so forth.
6. Place chain-of-custody form (see Figure 2) in a resealable plastic bag and tape to the inside of the cooler lid, close the lid, seal with custody seals, and transfer the cooler to the courier (see Figure 3). Alternatively, when samples will be delivered directly to the laboratory, close the cooler and hand-deliver it with the chain-of-custody form. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler.
7. Include any instructions for returning the cooler to the inside of the lid.
8. Place two signed custody seals (see Figure 4) on opposite sides of the cooler, ensuring that each one covers the cooler lid and side of the cooler (see Figure 5, note that the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in Figure 5). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal.
9. Shipping containers must be marked “THIS END UP,” and arrow labels, which indicate the proper upward position of the container should be affixed to the container (see Figures 3 and 5).

2.1.3 Shipping Asbestos Samples

Asbestos samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

1. Place each asbestos sample in a small resealable plastic bag. Place the bags of asbestos samples in a large resealable plastic bag.
2. Select a rigid shipping container (FedEx box) and pack the cassettes upright in a non-contaminating, non-fibrous medium such as a bubble pack to prevent excessive movement during shipping.
3. Avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials because of possible contamination.
4. Affix custody seals to the top of the cassettes or outer sample bag so that the bags cannot be opened without breaking the seal.
5. Insert the chain-of-custody form in the box. Include a shipping bill and a detailed listing of samples shipped, their descriptions and all identifying numbers or marks, sampling data, shipper’s name, and contact information.
6. Ship bulk samples in a separate container from air samples. Bulk samples and air samples delivered to the analytical laboratory in the same container will be rejected.

7. For each sample set, designate which are the ambient samples, which are the abatement area samples, which are the field blanks, and which is the sealed blank if sequential analysis is to be performed.
8. Hand-carry samples to the laboratory in an upright position if possible; otherwise, choose that mode of transportation least likely to jar the samples in transit.
9. Address the package to the laboratory sample coordinator by name when known and alert him or her of the package description, shipment mode, and anticipated arrival as part of the chain-of-custody and sample tracking procedures. This information will also help the laboratory schedule timely analysis for the samples when they are received.

2.1.4 Shipping Air Samples

Packaging and shipping requirements for air samples vary depending on the media used to collect the samples and the analyses required. Sampling media typically include Summa canisters and Tedlar bags for whole air samples, filters for metals and particulate matter, and sorbent tubes for organic contaminants. This section of the SOP provides general guidelines for packaging and shipping air samples collected using these media. The project FSP or QAPP should also be reviewed for any additional project-specific requirements or instructions.

Summa Canister Samples

1. Close the canister valve by tightening the knob clockwise or flipping the toggle switch. Replace the brass cap on the canister inlet.
2. If a flow controller was used to collect the air sample over a specified time interval, the flow controller should be removed before replacing the brass cap.
3. Fill out the sample tag on the canister with the sample number and the date and time of collection. Include the identification number of the flow controller on the sample tag if one was used. Make sure the information on the sample tag matches the chain-of-custody form.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final Summa canister vacuum readings; Summa canister identification number; and flow controller identification number.
5. Package the Summa canister (and flow controller) in its original shipping box with the original packaging material. Tape the box shut and apply custody seals if required. Note: Summa canisters should never be packaged with ice.
6. Summa canister shipments typically include several canisters, and may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes.
7. Ship the samples by a method that will meet the holding time. Summa canister samples should be analyzed within 30 days of sample collection.

Tedlar Bag Samples

1. Close the Tedlar bag by tightening the valve clockwise.

2. Fill out the label on the bag with the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form.
4. Package the Tedlar bag in a shipping box with appropriate packing material. Multiple bags can be packaged in the same box. Tape the box shut and apply custody seals if required. Note: Tedlar bag samples should not be cooled or packaged with ice.
5. Tedlar bag shipments may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes.
6. Ship the samples using priority overnight delivery. Tedlar bag samples should be analyzed within 3 days of sample collection.

Filter Cassette Samples

1. Disconnect the filter cassette from the air sampling pump and replace the plastic caps on the inlet and outlet openings.
2. Attach a label to the sample that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
4. Package the filter cassettes in a shipping box (such as a FedEx box). Use an appropriate packing material (such as bubble wrap) to separate the samples and prevent damage.
5. Place the chain-of-custody form within the box, seal the box, and apply custody seals if required. Filter cassette samples typically do not need to be cooled, but check the FSP or QAPP for project-specific requirements.
6. Ship the samples by a method that will meet the holding time.

Sorbent Tube Samples

1. Disconnect the sample tube from the air sampling pump and seal both ends of the tube with plastic caps.
2. Complete a sample label that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. If the tube is small and the label cannot be attached to the tube, the tube can be placed in a small sealable plastic bag and the label can be attached to the bag or placed inside the bag with the tube.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.

5. Packaging requirements for the sample tubes will depend on the analysis required, and the sampler should check the FSP or QAPP for project-specific requirements (for example, tubes may need to be wrapped in aluminum foil to prevent exposure to light). Packaging containers and methods include (1) shipping boxes (as described under filter cassette samples), (2) small sample coolers filled with double-bagged ice, and (3) small sample coolers filled with blue ice.
6. Place the chain-of-custody form within the box or container, seal the box or container, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time.

Polyurethane Foam (PUF) Tube Samples

1. Disconnect the PUF tube from the air sampling pump and wrap the tube in aluminum foil.
2. Attach a label to the wrapped sample tube that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Wrap the PUF tube in bubble wrap and place the tube in a glass shipping jar.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
5. Package the PUF tube jars in a cooler that is filled with double-bagged ice. Use bubble wrap or other cushioning material to separate the samples and prevent breakage.
6. Place the chain-of-custody form within the cooler, seal the cooler, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time. Samples collected in PUF tubes typically must be extracted within 7 days of collection.

2.2 SHIPPING DOCUMENTATION FOR SAMPLES

Airbills, chain-of-custody forms, and custody seals must be completed for each shipment of non-hazardous environmental samples. Figures 1, 2, and 4 provide examples of these forms and instructions for completing them.

Field staff collecting samples should also review their field work plans to confirm what documentation must be completed during each sampling event, including client-specific requirements. For example, some EPA programs have a specific requirement to use Scribe software, an environmental data management system, to create sample documentation, electronically input information into Traffic Report or chain-of-custody forms, and enter other data.

- The Scribe software can be accessed from the EPA Environmental Response Team (ERT) at the following address: http://www.ertsupport.org/scribe_home.htm
- The ERT User Manual for Scribe, reference, and training materials can be accessed from the Scribe Support Web site at the following address: http://www.epaosc.org/scribe

Note that some laboratories must routinely return sample shipping coolers within 14 calendar days after the shipment has been received. Therefore, the sampler should also include instructions for returning the cooler with each shipment, when possible. The sampler (not the laboratory) is responsible for paying for return of the cooler and should include shipping airbills bearing the sampler's shipping account number,

as well as a return address to allow for return of the cooler (see Figure 1). Samplers should use the least expensive option possible for returning coolers.

2.3 SHIPMENT DELIVERY AND NOTIFICATION

A member of the field sampling team must contact the laboratory to confirm it accepts deliveries on any given day, especially Saturdays. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required. The sampler needs to know the laboratory's contact name, address, and telephone number and be aware of the laboratory's requirements for receiving samples.

The sampler needs to know the shipping company's name, address, and telephone number (see Figure 1). In addition, samplers should be aware of the sample holding times, shipping company's hours of operation, shipping schedule, and pick-up and drop-off requirements to avoid delays in analytical testing.

Priority Overnight Delivery

Priority overnight delivery is typically the best method for shipment. Delays caused by longer shipment times may cause the sample temperature to rise above the acceptable range of 4° C (+ 2 ° C) and technical holding may expire, which in turn may compromise sample integrity and require recollection of samples for analysis. If sample delivery procedures are to be modified for particular contract- or laboratory-specific requirements, the procedures should be clearly described in site-specific plans such as work plans, FSPs, or QAPPs.

Saturday Delivery

If planning to ship samples for Saturday delivery, the laboratory must be contacted in advance to confirm it will accept deliveries on Saturdays or arrange for them to be accepted. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required.

2.4 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHA) for the project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment (PPE) necessary to address potential hazards. The hazards specific to project tasks must be identified and

controlled to the extent practicable and communicated to all project personnel via the approved, project-specific Health and Safety Plan (HASP).

3.0 POTENTIAL PROBLEMS

The following potential problems may occur during sample shipment:

- Leaking package. If a package leaks, the carrier may open the package and return the package. Special care should be taken during sample packaging to minimize potential leaks.
- Improper labeling and marking of package. If mistakes are made in labeling and marking the package, the carrier will most likely notice the mistakes and return the package to the shipper, thus delaying sample shipment. A good practice is to have labels, forms, and container markings double checked by a member of the field team.
- Bulk samples and air samples delivered to the analytical laboratory in the same container. If samples are combined in this way, they will be rejected. Always ship bulk samples in separate containers from air samples.
- Issues in packing asbestos samples. When asbestos samples are shipped, avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials with asbestos samples because of possible contamination.
- Improper, misspelled, or missing information on the shipper’s declaration. The carrier will most likely notice these errors as well and return the package to the shipper. A good practice is to have another field tram member double check this information.
- Missed drop off time or wrong location. Missing the drop off time or having the wrong location identified for drop off will delay delivery to the laboratory and may cause technical holding times to expire. Establish the time requirements in advance of completing the field

effort and be sure and provide some contingency time for potential delays such as traffic or checking and redoing paperwork.

- Incorrectly packaging samples for analysis at multiple laboratories. For example, inorganic samples may be shipped to one laboratory for analysis, while organic samples may need to be shipped to another laboratory. All field staff should be aware which samples are to be shipped to which laboratory they package samples for multiple types of analysis.

- Holidays or weather-related delays. Be aware of holidays and weather forecasts that could cause delays in delivery. Delays caused by longer shipping times may cause technical holding times to expire, which in turn may compromise sample integrity or require recollection of samples for analysis.

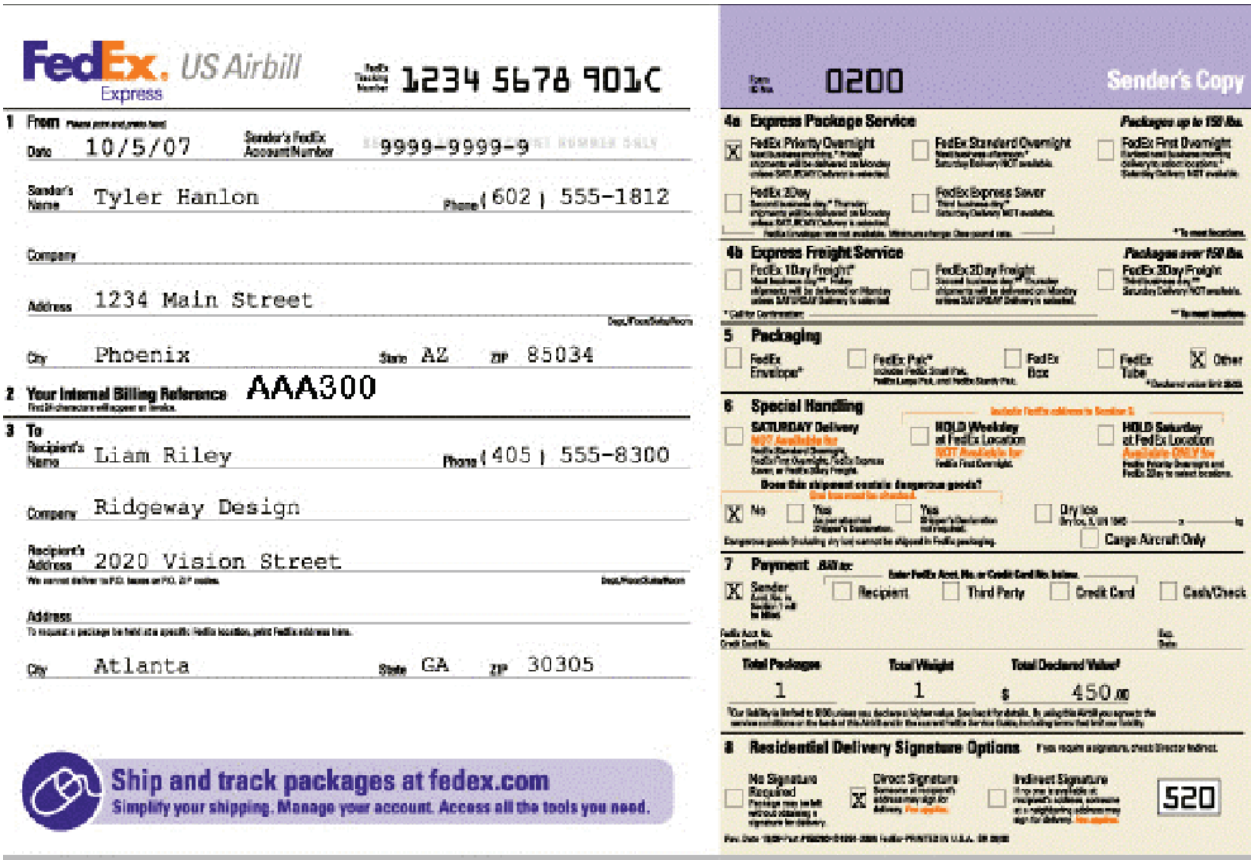
- Not noting field variances in field log book. Field variances should be noted in the field log book and the project manager notified. Common field variances include:

  − Less sample volume collected than planned. Notify appropriate staff and the laboratory to ensure there is an adequate amount for analysis.

− Sample collected into incorrect jar because of broken or missing bottle-ware. Notify appropriate laboratory staff to ensure there is no confusion regarding the analysis of the sample.

FIGURE 1

EXAMPLE OF A FEDEX US AIRBILL FOR LOW LEVEL ENVIRONMENTAL SAMPLES



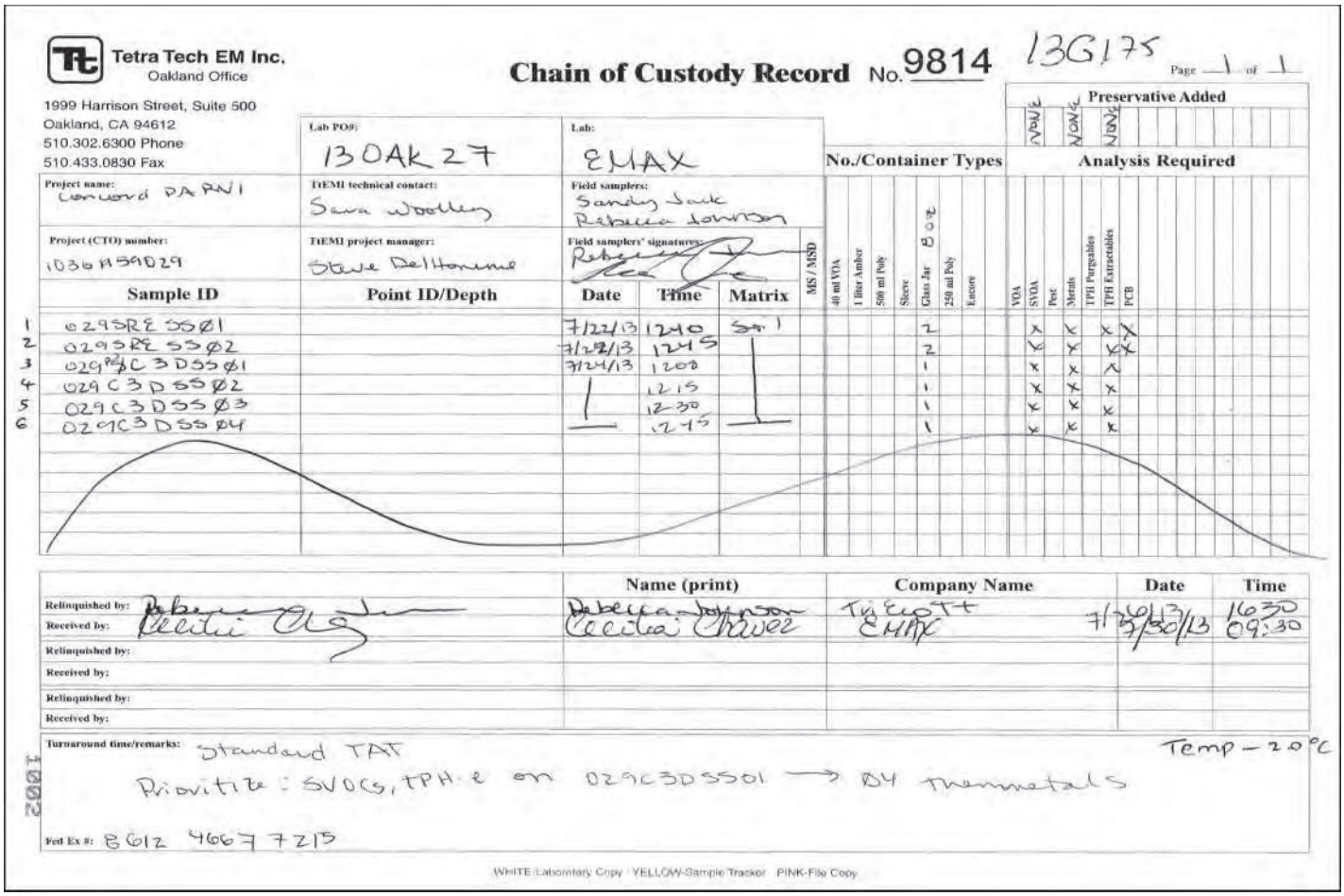
Filling Out the FedEx US Airbill

- The sender *must complete* the following fields on the pre-printed airbill:

- Section 1: Date
- Section 1: Sender's FedEx Account Number
- Section 1: Sender's Name, Company, Address, and Phone Number
- Section 2: Internal Billing Reference (Project Number)
- Section 3: Recipient's Name, Company, Address, and Phone Number
- Section 4: Express Package or Freight Services (Priority Overnight)
- Section 5: Packaging (usually "Other," your own packaging)
- Section 6: Special Handling (Saturday delivery if prearranged with receiving laboratory; "No" dangerous goods contained in shipment)
- Section 7: Payment ("Bill to Sender")
- Section 7: Total Number of Packages
- Section 7: Total Weight (completed by FedEx employee)
- Section 8: Delivery Signature Options ("No Signature Required")

FIGURE 2

EXAMPLE OF A CHAIN-OF-CUSTODY FORM (WHITE COPY)



Tetra Tech EM Inc.
Oakland Office
1999 Harrison Street, Suite 500
Oakland, CA 94612
510.302.6300 Phone
510.433.0830 Fax

Chain of Custody Record No. 9814 13G175 Page 1 of 1

Lab PO#: 130Ak27
Lab: EMAX
Project name: Concord PA PN1
TtEMI technical contact: Sara Woolley
Field samplers: Sandy Sack, Rebecca Johnson
Project (CTO) number: 103501159029
TtEMI project manager: Steve Dellhomme
Field samplers' signatures:

Preservative Added: None / None / None

	Sample ID	Point ID/Depth	Date	Time	Matrix	MS / MSD	No./Container Types: 40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 8 oz	250 ml Poly	Encore	Analysis Required: VOA	SVOA	Pest	Metals	TPH Purgeables	TPH Extractables	PCB
1	0295RE5501		7/22/13	1240	Soil						2			X	X			X	X	
2	0295RE5502		7/22/13	1245							2			X	X			X	X	
3	029[22]C3D5501		7/24/13	1200							1			X	X			X		
4	029C3D5502			1215							1			X	X			X		
5	029C3D5503			1230							1			X	X			X		
6	029C3D5504			1245							1			X	X			X		

	Name (print)	Company Name	Date	Time
Relinquished by:	Rebecca Johnson	TtEMI	7/26/13	1630
Received by:	Cecilia Chavez	EMAX	7/30/13	09:30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks: Standard TAT — Temp – 20°C
Prioritize: SVOCs, TPH-e on 029C3D5501 → BY Thermetals
Fed Ex #: 8612 4667 7215

2001

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

Completing a Sample Chain-of-Custody Form

After samples have been collected, they will be maintained under chain-of-custody procedures. These procedures are used to document the transfer of custody of the samples from the field to the designated analytical laboratory. The same chain-of-custody procedures will be used for the transfer of samples from one laboratory to another, if required.

The field sampling personnel will complete a Chain-of-Custody and Request for Analysis (CC/RA) Form (Figure 1, Chain of Custody Record) for each separate container of samples to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis. Information contained on the triplicate, carbonless form will include:

1. Project identification (ID) (for example, contract and task order number);
2. Project Contract Task Order (CTO) number;
3. Laboratory Project Order (PO) number;
4. Tetra Tech Technical Contact;
5. Tetra Tech Project Manager
6. Laboratory name;
7. Field sampler names;
8. Field sampler signature;
9. Sample ID;
10. Point ID and Depth (Do **NOT** include this information on the laboratory copy of the chain-of-custody (top white copy);
11. Date and time of sampling;
12. Sample matrix type;
13. Sample preservation method; note "NONE" if no preservatives;
14. Number and types of sample containers and container capacity;
15. Sample hazards (if any);
16. Requested analysis;
17. Requested sample turnaround time or any special remarks;
18. Page __ of __;
19. Method of shipment;
20. Carrier/waybill number (if any);
21. Signature, name, and company of the person relinquishing the samples and the person receiving the samples when custody is transferred;
22. Date and time of sample custody transfer;
23. Condition of samples when they are received by the laboratory.

The sample collector will cross out any blank space on the CC/RA Form below the last sample number listed on the part of the form where samples are listed.

The sampling personnel whose signature appears on the CC/RA Form is responsible for the custody of a sample from time the sample is collected until the custody of the sample is transferred to a designated laboratory, a courier, or to another Tetra Tech employee for transporting a sample to the designated laboratory. A sample is considered to be in custody when the custodian: (1) has direct possession of it; (2) has plain view of it; or (3) has securely locked it in a restricted access area.

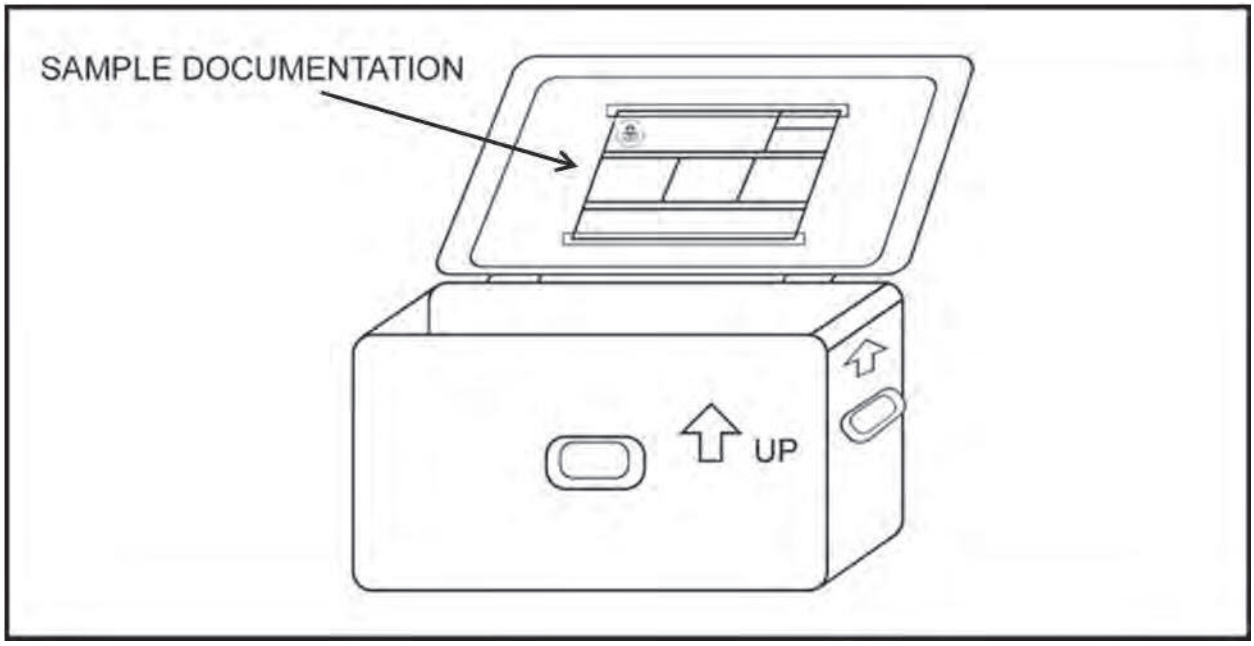
Custody is transferred when both parties to the transfer complete the portion of the CC/RA Form under "Relinquished by" and "Received by" or a sample is left at a FedEx facility pending shipment.

Signatures, printed names, company names, and date and time of custody transfer are required. When custody is transferred, the Tetra Tech sampling personnel who relinquished the samples will retain the third sheet (pink copy) of the CC/RA Form. When the samples are shipped by a common carrier, a Bill of Lading supplied by the carrier will be used to document the sample custody, and its identification number will be entered on the CC/RA Form. Receipts of Bills of Lading will be retained as part of the permanent documentation in the Tetra Tech project file.

FIGURE 3

EXAMPLE OF A SAMPLE COOLER WITH ATTACHED DOCUMENTATION

Place the necessary paperwork (chain-of-custody form, cooler return instructions, and associated paperwork) in the shipping cooler or acceptable container. All paperwork must be placed in a plastic bag or pouch and then secured to the underside of the shipping container lid.



Source: U.S. Environmental Protection Agency. 2011.

FIGURE 4

EXAMPLE OF A CUSTODY SEAL

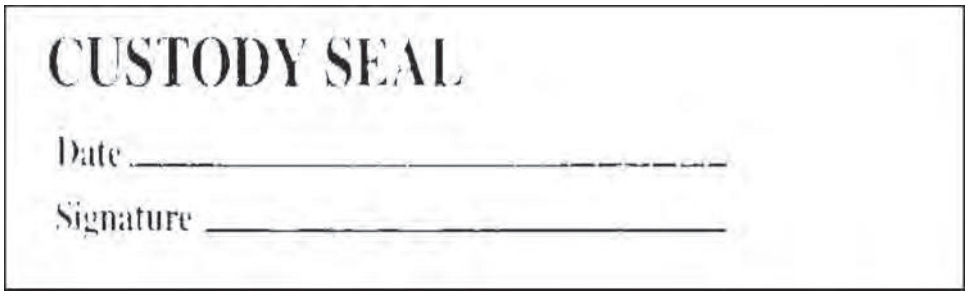
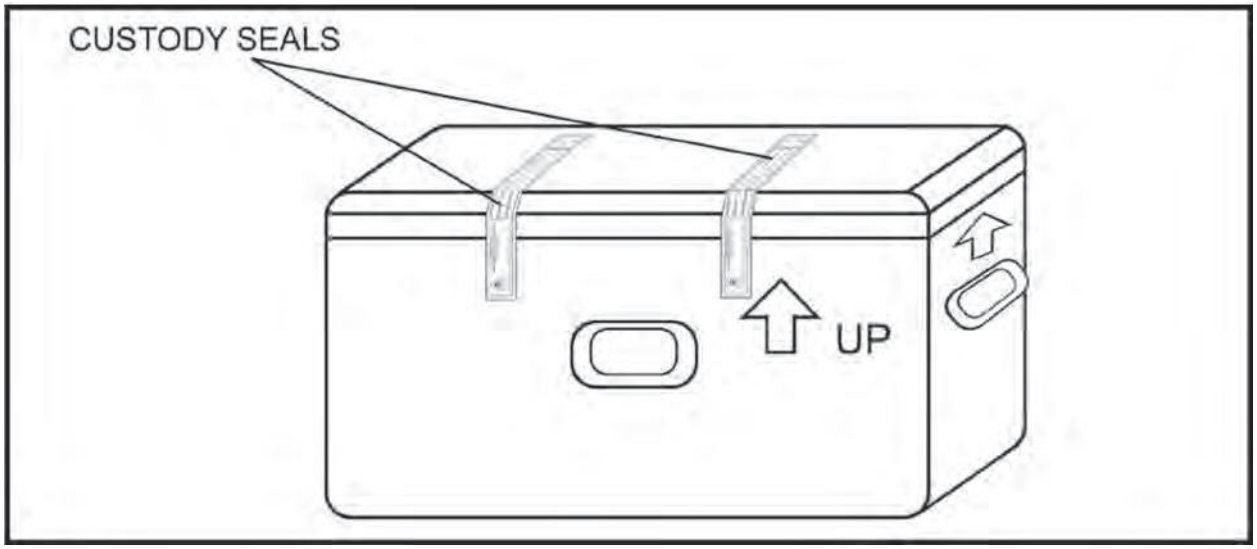


FIGURE 5

EXAMPLE OF SHIPPING COOLER WITH CUSTODY SEALS



Source: U.S. Environmental Protection Agency. 2011.

Please note that the two seals typically are affixed *to opposite sides of the cooler and offset from each other*, although the offset is not depicted on the EPA figure above.

Appendix D

Sample Transferee's Certification

Instructions:

- Do not delete the footnotes from this document so they are available in the future if the parties need to draft a site-specific certification.
- If the State is a party to the settlement, include the bracketed language in dark red throughout this document. Revise language as appropriate based on the expected State roles and responsibilities. Add a separate signature page for the State if it is a party.
- Delete these instructions before finalizing the settlement.

Certification of: [**Transferee's name**]
In the Matter of: [**Site name and Location**]
CERCLA Docket No.: [**number**]

Under penalty of perjury, 28 U.S.C. § 1746, [**Transferee's name**], represented by the undersigned, certifies that the following is true and accurate:

1. [**Transferee's name**] ("Transferee") intends to acquire the property located at [**insert description of property**] ("Transferee's Property").

2. Transferee acknowledges that Transferee's Property is part of the [**name of Superfund Site**] ("Site") and is subject to the Administrative Settlement Agreement for Remedial Action by Prospective Purchaser between the United States[, the State,] and [**Purchaser's name**] ("Settlement"), CERCLA Docket No. [**number**].

3. Transferee has reviewed the Settlement.

4. By submission of this Certification to the U.S. Environmental Protection Agency ("EPA")[and the State], signed by a person authorized to bind Transferee, Transferee is requesting that EPA [and the State]give written consent to the assignment of the obligations in this Certification, which are currently required of [**Purchaser's name**] under the Settlement.

5. So long as Transferee retains an interest in the Transferee's Property, Transferee agrees:

    a. [pursuant to Section VI (Response Action to be Performed), to perform [**insert ongoing obligations related to the Response Action**]; and][1]

[1] Include this paragraph if there are ongoing obligations related to the Response Action being assigned to Transferee that are required under Section VI, not under the Property Requirements Section, of the Settlement and have been determined by EPA [and the State]to be insufficient for the United States [and the State]to provide a covenant not to sue to Transferee pursuant to ¶ [28.d(2)] of the Settlement (e.g., mowing grass over a cap).

b. to comply with Section VII (Property Requirements).

6. [Transferee agrees to comply with Section XIX (Records). Upon request of Transferee, EPA may shorten the Record Retention period for any Records covered by Section XIX.][2]

7. Transferee agrees EPA[and the State] has[have] the authority to enforce the obligations in Paragraph[s] 5 [and 6]of this Certification against Transferee.

8. Transferee has no other obligations under the Settlement.

9. Transferee acknowledges that it is not receiving the rights and benefits provided to Purchaser under the Settlement. Instead, Transferee has taken steps to avail itself of protections afforded a "bona fide prospective purchaser" (BFPP) under CERCLA section 101(40) and 107(r)(1) ("BFPP protections"), 42 U.S.C. §§ 9601(40) and 9607(r)(1), and will continue to maintain its status as a BFPP for the duration of its interest in the Transferee's Property, including taking reasonable steps in accordance with CERCLA section 101(40).

10. Until EPA issues a Certification of Work Completion under ¶ [**5.10**] of the Settlement Statement of Work, Transferee agrees that upon the sale or other conveyance of title of any of the Transferee's Property, Transferee will require future transferees to submit a certification in substantially the same form to EPA[and the State], unless EPA[and the State] directs[direct] otherwise. If EPA has issued a Certification of Work Completion or EPA [and the State]otherwise determines[determine] that a Transferee's certification is not required, instead of submitting a certification, a future transferee should take steps to avail itself of the BFFP protections for the duration of its interest in any of the Transferee's Property.

11. If the Settlement is modified in the future, Transferee shall continue to be bound by this Certification, unless and until it signs and submits a new certification to EPA.

Contacts:

As to Transferee:	[**name of email address for Transferee's representative**]
As to DOJ:	eescdcopy@usdoj.gov Re: DJ # [**EES DJ number**]
As to EPA:	[**name and email address for EPA's RPM**] [**name and email address for EPA's Site attorney**] Re: Site/Spill ID # [**EPA Site/Spill number**]
As to Purchaser:	[**name and email address for Purchaser's representative**]

[2] Include this paragraph if EPA has not issued a Certification of Work Completion under the Settlement.

[As to the State:] [**name and email address for State's representative**]

Certified by:

[**Name of Transferee**]

By: _____ Executed on: [**date**]
[**Name**]
[**Title**]
[**Company**]
[**Address**]

Signature Page[3] for Transferee's Certification regarding the **[Site name]** Superfund Site (CERCLA Docket No. [**number**])

The U.S. Environmental Protection Agency hereby gives written consent to assign to Transferee the Settlement obligations specified in this Certification with respect to Transferee's Property. [**Option 1:** As of the date of EPA's signature of this Certification, Purchaser's obligations under the Settlement are terminated with respect to Transferee's Property consistent with ¶ [28] of the Settlement, except for those obligations listed in ¶ [28.f] of the Settlement.][4] [**Option 2:** Purchaser's obligations under the Settlement are not terminated by this Certification.][5]

By: _____

[**Name**] Dated
[**Title**]
U.S. Environmental Protection Agency
Region [**number of Region**]

[3] A separate signature page is required for each party. Send a signed copy to the Purchaser.
[4] Choose one sentence. Keep Option 1, and modify as appropriate, if Purchaser's obligations are being terminated upon execution of this Certification.
[5] Keep Option 2 if none of Purchaser's obligations are being terminated upon execution of this Certification. Do not use both.