STATEMENT OF WORK

SITE OPERATIONS AND MAINTENANCE

IRON MOUNTAIN MINE

SHASTA COUNTY, CALIFORNIA

October 2, 2000

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1. Introduction

1. This Statement of Work (SOW) includes the principal steps necessary to operate and maintain the currently selected CERCLA remedy at the Iron Mountain Mine (IMM) over the Performance Period, in a highly reliable manner. It is the Site Operator's obligation to implement this SOW.

2. In general, the IMM Remedy includes remedial actions selected by the EPA to respond to hazardous substance releases from Iron Mountain Mine. The IMM Remedy involves, among other things, the collection, conveyance, and treatment of all acid mine drainage (AMD) from the Richmond Mine workings, the Lawson Mine workings, the Old/No. 8 Mine workings, and the disturbed portion of the Slickrock Creek watershed collected behind the Slickrock Creek Retention Reservoir (SCRR). The IMM Remedy requires treatment of all these flows at a high density sludge (HDS) treatment plant and the long-term onsite storage of sludge generated from the treatment process.

3. The IMM Remedy also requires proper operation and maintenance of clean water diversions, caps, disposal cells, an onsite landfill, the mine workings, Site infrastructure such as roads and other civil projects, the Boulder Creek Tailings Dam, offsite activities in connection with Site access, and the downstream impacts of clean water diversions and other activities.

4. The IMM Remedy also includes components that promote reliable operation of the Site under a wide variety of adverse conditions. These include emergency backup electrical generators, emergency storage tanks, horizontal drains in the Boulder Creek landslide, and effective maintenance requirements for the mine workings and other facilities.

5. Activities to be implemented under this SOW include, but are not limited to, performing routine and non-routine operation and maintenance; conducting emergency response actions to ensure continuous operation of the IMM Remedy; replacing major and minor equipment on an as-needed basis; responding to changing Site conditions to ensure continuous achievement of the Performance Standards and other requirements of this SOW, including but not limited to damage caused by extreme events and other changes that affect the Site or Site facilities; performing any and all other actions necessary to meet the Performance Standards and all other requirements of this SOW.

6. The actions to be implemented under this SOW are performed under government oversight, but the Site Operator assumes full responsibility for attaining the Performance Standards and meeting all other requirements of this SOW.

7. The general description in this Section is intended to be explanatory and introductory in nature and is not intended to expand or limit the scope of activities required by this SOW.

2. Definitions

Unless otherwise expressly provided herein, terms used in this SOW that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in the statute or its implementing regulations. Whenever terms listed below are used in this SOW, or in the documents attached to this SOW, or incorporated by reference into this SOW, the following definitions shall apply:

1. "Adit" shall mean a horizontal or near-horizontal access way connected to the ground surface.

2. "AMD" shall mean acid mine drainage, acid rock drainage, or acid drainage.

3. "Brick Flat Pit (BFP) Landfill" shall mean the disposal cell used to store HDS sludge produced at the Minnesota Flats Treatment Plant. The BFP Landfill shall be subject only to federal and State Regulations related to landfills identified in the RODs, applicable designs, and this SOW.

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

5. "Consent Decree" shall mean the consent decree signed by the Site Operator, EPA, and others in connection with the Site.

6. "Day" shall mean a calendar day unless expressly stated to be a Working Day.

7. "Designated Contaminant Discharges" shall mean the following AMD that historically discharged from the Richmond Portal, Lawson Portal, and Old/No. 8 Mine Seep, and all AMD-contaminated flows collected by the SCRR.

    a. At the Richmond Portal, all AMD currently collected at the 5-way check dam, approximately 1,400 feet inside the Richmond Portal, and floor drainage collected at the Richmond Portal (as described in the document *Richmond Adit and Drifts Rehabilitation As Built Report* [North Pacific Research, October 2004]);

    b. At the Lawson Portal, all AMD currently collected at the primary check dam, approximately 550 feet from the portal, and floor drainage collected at the secondary check dam approximately 60 feet from the Lawson portal (as described in the document *Boulder Creek Remedial Investigation Report* [EPA, May 1992]);

    c. At the Old/No. 8 Mine, all AMD currently collected by pumping the No. 8 Mine workings using Wells PW2 and PW3 (the artesian AMD flow referenced as the Old/No. 8 Mine Seep in the document *Remedial Investigation and Feasibility Study Old/No. 8 Mine Seep Operable Unit* [EPA, December 1992]); and

    d. All flows entering the SCRR catchment area up to the capacity of the reservoir and operation of the Minnesota Flats Treatment Plant (as described in *Draft Operations*

and Maintenance Manual for Slickrock Creek Dam and Slickrock Creek Retention Reservoir [CH2M HILL, June 11, 2004]).

8. "Dispute Resolution" shall mean the process set forth in Section XIX of the Consent Decree.

9. "Dry Landfill" shall mean a disposal cell in which the fill material (for example, sludge placed in BFP) is placed and compacted in a controlled, engineered manner. The minimum requirements for operating BFP as a dry landfill are given in Section 9.7.2.

10. "DTSC" shall mean the California Department of Toxic Substances Control, and any successor agency, officials, and employees acting within the scope of their duties and in their capacity as officials or employees.

11. "Effective Date of this SOW" shall mean the first day of the Performance Period.

12. "Emergency Response" shall mean steps necessary to make emergency repairs due to damage by storms, major equipment or infrastructure failures, earthquakes, landslides, or any other factor to ensure continuous operation of the IMM Remedy.

13. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States, and its officials and employees acting within the scope of their duties and in their capacity as officials and employees.

14. "EPA/State MOU" shall mean the Memorandum of Understanding among EPA, DTSC, and the RWQCB regarding the relationship between the Oversight and Support Agencies with respect to this SOW and the Consent Decree (Appendix H to the Consent Decree).

15. "Force Majeure" shall have the meaning as set forth in Section 7.15 of this SOW.

16. "IMM Remedy" shall mean all response actions selected in the U.S. EPA Records of Decision (RODs 1 through 4) and all removal actions identified in the Consent Decree, other than as identified on Attachment A. In general, the IMM Remedy includes the following:

    a. Collect, convey, and treat all Designated Contaminant Discharges using the high density sludge treatment process;

    b. Inspect, maintain, and operate the O&M Units, listed and described in Section 9, in a manner that maximizes the reliability and long-term performance of the engineered structures, landforms (mine workings, creeks, and hillslopes), and infrastructure (roads and utilities); and

    c. Inspect, maintain, and operate all other Site locations not specifically designated an O&M Unit that may affect the performance of the O&M Units, or that can result in the release of hazardous substances from the Site.

17. "Inflation Escalator" shall be the Consumer Price Index for all Urban Consumers (CPI-U) published by the Department of Labor, Bureau of Statistics. In the event the CPI-U is no longer available, an appropriate substitute index shall be used.

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

19. "Non-routine O&M" includes all activities that are needed on an irregular, less frequent basis than Routine O&M activities to reliably operate and maintain the IMM Remedy and to meet the Performance Standards and other requirements of this SOW. These activities include, but are not limited to, periodic refurbishment of the sludge drying beds, replacement of major equipment items, replacement of mine supports and sets, repair of damage associated with storms less severe than a 25-year storm, upgrades to Site facilities necessary to ensure reliability of the IMM Remedy, and other components of the Work described in Section 9, *Routine and Non-routine O&M*, of this SOW.

20. "Operation and Maintenance," "O&M" or "Work" shall mean all activities required to maintain the effectiveness of the IMM Remedy, including but not limited to, Routine O&M, Non-routine O&M, Emergency Response, Response to Extreme Events, Remedial Design, and Remedial Action activities required under this SOW, and the Management Plans developed by the Site Operator pursuant to Section 6, *Management Plans and Reports*, of this SOW, and approved by the Oversight Agency, and any and all other actions required by this SOW.

21. "O&M Unit" shall mean the facilities described in Section 9 of this SOW and any upgrades or improvements thereto.

22. "O&M Unit Components" shall mean all elements associated with an O&M Unit, including but limited to, non-engineered structures and materials (including but not limited to creeks, hillslopes, landslides, existing soil, natural drainages, mine workings, trees, and brush), and all engineered structures (including but not limited to, buildings, pipelines, equipment, systems, retaining walls, tanks, roadways, and all items listed in Section 9 for each O&M unit).

23. "Oversight Agency" shall mean the agency(ies) of the United Sates or the State that serves as the "lead agency" within the meaning of the NCP. At the start of the Performance Period, EPA shall serve as the lead agency. At the discretion of the State and federal government, the governments may change the Oversight Agency to other State or federal agencies during the duration of the Performance Period.

24. "Portal" shall mean the above-ground entrance to an adit.

25. "Paragraph" shall mean a subportion of Sections of this SOW identified by an Arabic numeral and its subparts.

26. "Performance Period" shall mean the period from the Inception Date of the Policy to 30 years from the Inception Date of the Policy (e.g. if the Inception Date is December 15, 2000, the Policy Period shall run from December 15, 2000 to December 15, 2030) unless modified by mutual consent of the Site Operator and the Oversight Agency.

27. "Performance Standards" shall mean those cleanup standards, standards of control, and other substantive requirements, objectives, criteria, or limitations that have been adopted as of August 1, 2000, and that are identified in Section 8 and Section 14.

28. "Policy" shall mean the *Iron Mountain Mine Manuscript* Cleanup Cost Cap Pollution Legal Liability Select™ Insurance Policy issued by American International Specialty Lines Insurance Company, a copy of which is attached as Appendix J to the Consent Decree and any subsequent endorsements agreed to by the "Oversight Agency" and Chartis Specialty Insurance Company (f/k/a American International Specialty Lines Insurance Company).

29. "RWQCB" shall mean the California Regional Water Quality Board for the Central Valley Region, and any successor agency, officials, and employees acting within the scope of their duties and in their capacity as officials or employees.

30. "Record Drawings" shall mean drawings that show the manner, location, and dimensions of all Work as actually performed. Preparing a Record Drawing involves marking a set of drawings to show details of Work items that were not performed exactly as they were originally designed and shown in the final design drawings, such as changed Work, changed Site conditions, and variations in alignment and location. In addition, details and exact dimensions are given for those Work items that were not precisely located on the final design such as depths, locations, and routings of electrical service and underground piping and utilities.

31. "Records of Decision" or "RODs" shall mean the U.S. EPA Region IX Records of Decision relating to the Site and all attachments thereto. These include: (a) ROD1 signed on October 3, 1986, by the Assistant Administrator, Office of Solid Waste and Emergency Response, (b) ROD2 signed on September 30, 1992, by John Wise for the Regional Administrator, (c) ROD3 signed on September 24, 1993, by John Wise, Acting Regional Administrator, and (d) ROD4 signed on September 30, 1997, by the Director, Superfund Division.

32. "Remedial Action" or "RA" shall mean those activities to be undertaken by the Site Operator to implement the Remedial Design for all facilities, structures, or equipment to be constructed, erected, or installed as required by this SOW.

33. "Remedial Design" or "RD" shall mean those investigations, analyses, or design activities to be undertaken by the Site Operator to develop the plans and specifications for all facilities, structures, or equipment to be constructed, erected, or installed as required by this SOW.

34. "Response Costs" shall mean all costs, including direct costs, indirect costs, and accrued interest incurred by the United States or the State to perform or support response action at the Site in connection with Work Takeover as set forth in Section 7.16 or Section 10 of this SOW and the costs of insurance purchased by the Oversight Agency as set forth in Section 5.1. Response Costs do not include Remedy Review costs paid by the Site Operator pursuant to Section 7.7.

35. "Response to Extreme Events" shall mean all activities (including but not limited to RD and RA activities) conducted in connection with the O&M Units, other Site facilities, or other components of the IMM Remedy to repair, replace, or upgrade O&M Units, other Site facilities, or other components of the IMM Remedy damaged by storms, earthquakes, landslides, mine collapse, intentional acts, or any other event (other than events addressed through Routine O&M or Non-routine O&M).

36. "Routine O&M" shall mean all normal, routine, regular operation and maintenance activities performed to operate and maintain the IMM Remedy and to meet the Performance Standards and other requirements of this SOW for all areas of the Site, including, but not limited to, the O&M Units.

37. "Statement of Work" or "SOW" shall mean this statement of work and all attachments included herein and incorporated by reference during the Performance Period.

38. "Section" shall mean a portion of this SOW identified by an Arabic numeral and includes one or more paragraphs.

39. "Site" shall mean the parcels listed in Attachment B and depicted generally on the map provided as Attachment C. In the event of inconsistency between the map and list of parcels, the list of parcels will control.

40. "Site Operator" means Global Loss Prevention, Inc. (f/k/a AIG Consultants, Inc.)

41. "State" shall mean the State of California and all of its agencies, officials, and employees acting within the scope of their duties and in their capacity as officials or employees.

42. "Support Agency" shall mean the agency(ies) of the United States or the State that support the activities of the Oversight Agency in accordance with the NCP. At the start of the Performance Period, the State of California, on behalf of DTSC and RWQCB, shall designate the State agency(ies) to be the Support Agency. At the discretion of the State and federal government, the governments may change the Support Agency to other State or federal agencies during the duration of the Performance Period.

43. "United States" shall mean the United States of America.

44. "Waste Material" shall mean (a) any hazardous substance under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (c) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (d) any "hazardous waste," "hazardous substance," "hazardous material," "waste," "pollutant," "contaminant," "mining waste," "pollution," or "contamination" under California Health & Safety Code §§ 25117, 25260, and 25316, California Water Code § 13050, and any provision of the Fish & Game Code.

45. "Work Takeover" shall mean a work takeover pursuant to Section 7.16 or Section 10 of this SOW.

46. "Working Day" shall mean a day other than a Saturday, Sunday, federal or State holiday. In computing any period of time under this SOW, where the last day shall fall on a Saturday, Sunday, federal or State holiday, the period shall run until the end of the next working day.

3. General O&M Requirements

1. The Site Operator shall operate and maintain all operational facilities and infrastructure components of the IMM Remedy in a proactive manner consistent with good engineering practice.

2. The Site Operator shall perform all Work in a manner that meets the Performance Standards and the other requirements of this SOW in a highly reliable manner.

3. The Site Operator shall operate the O&M Units in concert to provide continuous effective operation of the IMM Remedy, continuous compliance with the Performance Standards, and near-continuous access for personnel and materials to all areas of the Site to implement the IMM Remedy.

4. It is the Site Operator's obligation to meet the Performance Standards set forth in this SOW and other requirements of this SOW. The Site Operator assumes the risk that actions and facilities, in addition to the specific actions and O&M Units identified in this SOW, may be necessary to achieve the Performance Standards or to otherwise meet the requirements of this SOW. Except as provided in Section 9.2(5), the Site Operator shall upgrade the existing facilities that are not able to achieve the Performance Standards or other requirements of this SOW in a highly reliable manner, due to a change in Site conditions or any and all other factors whether known or unknown at the time of the Consent Decree. Failure of an existing facility, whether or not due to or during a Force Majeure event, is not conclusive evidence of the necessity for an upgrade.

5. The Site Operator shall develop and implement management plans and coordination procedures for execution of the Work in a manner that, at a minimum, meets the requirements specified in Section 6, *Management Plans and Reports*, of this SOW.

6. The Site Operator shall perform all monitoring and reporting requirements set forth in this SOW and in the work plans implementing this SOW.

7. The Site Operator is responsible for all procurement and support undertaken in connection with this SOW. The Site Operator shall procure, purchase, and store all quicklime, fuel, and other required materials in a manner that ensures continuous performance of the IMM Remedy.

8. The Site Operator is responsible for planning and executing the Work consistent with the requirements of this SOW.

9. The Site Operator is responsible for supervising all subcontracts and services in connection with this SOW and for assuring that the Work is performed in a manner consistent with this SOW.

10. The Site Operator is responsible for providing technical direction for all aspects of this SOW.

11. The Site Operator shall address any problems or conditions that currently exist or that may develop during the Performance Period that may jeopardize the reliable performance of the IMM Remedy. This includes problems and conditions resulting from failure to adequately operate and maintain the IMM Remedy and any other problem that may jeopardize the reliable performance of the IMM Remedy. This includes both known and unknown problems and conditions.

12. The Site Operator shall comply with the RD and RA requirements to the extent required by this SOW.

13. Except as otherwise provided in Section 4.2, the Site Operator is responsible for all costs and expenses and liability it, its subcontractors, and any related party incurs in connection with this SOW.

14. The Site Operator shall timely resolve or discharge any lien filed by any architect, engineer, contractor, or supplier, of any tier, providing any goods or services under contract with or on behalf of the Site Operator providing goods or services to the Site unless the Site Operator shall have posted a bond equal to the amount required by law.

15. As used in this SOW, the terms "repair," "replace" and "upgrade" mean to repair, replace, or upgrade, as needed, to ensure the achievement of all the Performance Standards and all other requirements of this SOW in a highly reliable manner.

4. Payment

4.1 Compensation of Site Operator for Work Under this SOW

1. The Policy, provided as Appendix J to the Consent Decree, has been established to pay a portion of the costs of the Site Operator in carrying out Work under this SOW and the Consent Decree. The Site Operator is responsible for costs and expenses not paid by the Policy, except as provided in Section 4.2.

4.2 Compensation of Site Operator for Added Scope Work

4.2.1 Added Scope Work

1. This Section provides the procedures regarding compensation for Work beyond the scope of this SOW. If, pursuant to Section 8.1(2) hereof, the Oversight Agency changes a Performance Standard or requires the Site Operator to conduct additional Work beyond the scope of this SOW, such work will be "Added Scope Work," provided that the Oversight Agency agrees in writing that the Work is Added Scope Work or that the Site Operator establishes through Dispute Resolution pursuant to Section XIX of the Consent Decree that such Work is beyond the scope of this SOW. If the Site Operator establishes, through Dispute Resolution pursuant to Section XIX of the Consent Decree, that such Work is beyond the scope of this SOW, the Oversight Agency may, in its sole discretion, decide whether to proceed or not proceed with the Added Scope Work.

4.2.2 Estimate of Additional Cost

1. If it is determined, by agreement or Dispute Resolution, that Work is Added Scope Work, the Site Operator shall provide the Oversight Agency with an estimate of the cost of performing the Added Scope Work. The cost estimate should consider any probable reduction in the cost of performing Work already required by this SOW resulting from performance of the Added Scope Work. The estimate will be used by the Oversight Agency to establish or augment the Iron Mountain Disbursement Special Account described in paragraph 4.2.3.

4.2.3 Iron Mountain Disbursement Special Account

1. If, after the receipt of the estimate from the Site Operator, the Oversight Agency elects to proceed with the Added Scope Work, EPA shall promptly establish a new special account, the Iron Mountain Disbursement Special Account, within the EPA Hazardous

Substance Superfund and shall transfer the estimated amount from the Iron Mountain Special Account to the Iron Mountain Disbursement Special Account. Subject to the terms and conditions set forth in this Section, EPA agrees to make the funds in the Iron Mountain Disbursement Special Account, including interest earned on the funds, if any, available for disbursement to the Site Operator, or to the Trust or under the Policy as appropriate in payment for the Added Scope Work.

4.2.3.1 Cost Certification

1. Prior to receiving any payment for Added Scope Work, the Site Operator shall provide EPA with a Cost Summary and Certification, or in the event of milestone or periodic payments, with Cost Summaries and Certifications relating to the milestone or periodic payment. Each Cost Summary and Certification shall include a complete and accurate written cost summary and certification of the necessary costs incurred and paid by the Site Operator for the Added Scope Work covered by the particular submission, excluding costs not eligible for disbursement under Section 4.2.3.2. Each Cost Summary and Certification shall contain the following statement signed by the chief financial officer or treasurer of the Site Operator, an independent certified public accountant, or other third party approved by the Oversight Agency:

   > "To the best of my knowledge, after thorough investigation and review of the documentation of costs incurred and paid for Added Scope Work performed pursuant to the Consent Decree and Statement of Work dated [_____, legal reference to Consent Decree], [insert as appropriate, "up to the date of completion of Milestone 1," between the date of completion of Milestone 1 and the date of completion of Milestone 2," "for the Added Scope Work described in ___," "for the Added Scope Work performed during the month of _____, 20__," or other appropriate designation of the Work completed by milestone or time period], I certify that the information contained in or accompanying this submittal is true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment."

2. The person executing this certification shall also provide EPA a list of the documents that he or she reviewed in support of the Cost Summary and Certification. Upon request by EPA, the Site Operator shall submit to EPA any additional information that EPA deems necessary for its review and approval of a Cost Summary and Certification.

3. If EPA finds that a Cost Summary and Certification includes a mathematical accounting error, costs excluded under Section 4.2.3.2 , costs that are inadequately documented, or costs submitted in a prior Cost Summary and Certification, it will notify the Site Operator and provide an opportunity to cure the deficiency by submitting a revised Cost Summary and Certification. If the Site Operator fails to cure the deficiency within thirty (30) days after being notified of, and given the opportunity to cure the deficiency, EPA will recalculate the Site Operator's costs eligible for disbursement for that submission and disburse the corrected amount to the Site Operator in accordance with the procedures in Section 4.2. The Site Operator may dispute EPA's recalculation under this Paragraph pursuant to Section XIX of the Consent Decree (Dispute Resolution). In no event shall the Site Operator be disbursed funds from the Iron Mountain Disbursement

Special Account in excess of amounts properly documented in a Cost Summary and Certification accepted or modified by EPA.

4.2.3.2 Costs Excluded from Disbursement

1. The following costs are excluded from, and shall not be sought by the Site Operator for disbursement from the Iron Mountain Disbursement Special Account: (a) Response Costs paid pursuant to Section XVI of the Consent Decree; (b) attorneys' fees and costs, except if agreed in writing by the Oversight Agency; (c) costs of any response activities the Site Operator performs that are not agreed to or determined to be Added Scope Work; (d) except as provided in Sections 4.2.4.2 or 4.2.4.3, internal costs of the Site Operator, including but not limited to, salaries, travel, or in-kind services, except for those costs that represent the Work of employees of the Site Operator directly performing the Added Scope Work; (e) any costs incurred by the Site Operator prior to written agreement by the Oversight Agency, or final determination by Dispute Resolution, that the Work is Added Scope Work; or (f) any costs incurred by the Site Operator pursuant to Section XIX of the Consent Decree (Dispute Resolution). Subsection (e) above shall not apply to the extent that, pursuant to Section 7.12, the Oversight Agency orders the Site Operator to perform Work directly in dispute if the Site Operator establishes through Dispute Resolution that Work is Added Scope Work. However, this Section does not limit the coverage that may be available under the Policy.

4.2.3.3 Termination of Disbursements from the Special Account

1. EPA's obligation to disburse funds from the Iron Mountain Disbursement Special Account under this SOW shall terminate as to that portion of the Added Scope Work to which the funds pertain upon EPA's determination that the Site Operator: (a) has knowingly submitted a materially false or misleading Cost Summary and Certification; (b) has submitted a materially inaccurate or incomplete Cost Summary and Certification, and has failed to correct the materially inaccurate or incomplete Cost Summary and Certification within ten (10) days after being notified of, and given the opportunity to cure the deficiency; or (c) has failed to submit a Cost Summary and Certification as required by Section 4.2.3.1(1) within thirty (30) days (or such longer period as EPA agrees) after being notified that EPA intends to terminate its obligation to make disbursements pursuant to this Section because of the Site Operator's failure to submit the Cost Summary and Certification required by Section 4.2.3.1(1). EPA's obligation to disburse funds from the Iron Mountain Disbursement Special Account shall also terminate as to that portion of the Added Scope Work to which the funds pertain upon EPA's assumption of performance of any portion of the Work pursuant to Section 7.16, when such assumption of performance of the Work is not challenged by the Site Operator or, if challenged, is upheld under Section XIX of the Consent Decree (Dispute Resolution). The Site Operator may dispute EPA's termination of special account disbursements under Section XIX of the Consent Decree (Dispute Resolution).

4.2.3.4 Recapture of Special Account Disbursements

1. Upon termination of disbursements from the Iron Mountain Disbursement Special Account under Section 4.2.3.3, if EPA has previously disbursed funds from the Iron

Mountain Disbursement Special Account for activities specifically related to the reason for termination (e.g., discovery of a materially false or misleading submission after disbursement of funds based on that submission), EPA shall submit a bill to the Site Operator for those amounts already disbursed from the Iron Mountain Disbursement Special Account specifically related to the reason for termination, plus interest on that amount covering the period from the date of disbursement of the funds by EPA to the date of repayment of the funds by the Site Operator. Within fifteen (15) days of receipt of EPA's bill, the Site Operator shall reimburse the Hazardous Substance Superfund for the total amount billed by a certified or cashier's check or checks made payable to "EPA Hazardous Substance Superfund," and delivered to the Oversight Agency.

4.2.3.5 Balance of Special Account Funds

1. If, after completion of the Added Scope Work, any funds remain in the Iron Mountain Disbursement Special Account, EPA may transfer such funds to the Iron Mountain Special Account or to the Hazardous Substance Superfund. Any transfer of funds to the Iron Mountain Special Account or the Hazardous Substance Superfund shall not be subject to challenge by the Site Operator pursuant to the Dispute Resolution provisions of the Consent Decree or in any other forum.

4.2.4 Methods of Calculating Payment for Added Scope Work

4.2.4.1 Lump Sum

1. The Site Operator and the Oversight Agency will negotiate in good faith to determine a fair cost for performing the Added Scope Work for a lump sum. At the option of the Oversight Agency, the lump sum amount may be:

   a. Added to this SOW by appropriate amendments to this SOW and the Insurance Policy funding the Site Operator's performance under this SOW; or

   b. Subject to a direct written agreement between the Site Operator and the Oversight Agency for performance of the Added Scope Work.

2. The lump sum amount will ordinarily be payable after completion of the Added Scope Work or proportionately after completion of jointly agreed milestone events. If payment is to be made by milestones, the parties will jointly negotiate the Work to be completed by a milestone and the percentage of the lump sum amount that is to be paid upon satisfactory completion of a milestone. The lump sum amount may have a retainage payable after completion of the last milestone and expiration of any periods for the filing and prosecution of mechanics' liens or similar claims arising out of the Added Scope Work.

3. The parties may negotiate for a present lump sum payment for ongoing future Work, provided that the insurance and financial assurance required by this SOW are amended to provide assurance that the future Work will be timely and properly completed.

4.2.4.2 Cost Plus

1. If the Site Operator and the Oversight Agency cannot agree on a lump sum amount for the Added Scope Work, the Oversight Agency may elect to pay for the Added Scope Work on a cost-plus basis..

2. At the request of the Oversight Agency, the Site Operator shall make available, during normal business hours, documents, records and financial data reflecting the costs incurred for the Added Scope Work. If the Site Operator's charges for Added Scope Work exceed the amount calculated based on documented costs, the Site Operator shall immediately pay to the Oversight Agency the difference between the audited costs and the amount actually received by the Site Operator.

4.2.4.3 Other Methods of Payment

1. Other methods of payment for Added Scope Work may be used if jointly agreed by the Oversight Agency and the Site Operator.

4.2.4.4 Effect of Cost Reductions

1. If the Added Scope Work will probably reduce the cost of performing the Work already required under this SOW, then the compensation for the Added Scope Work will be reduced by the estimated savings in the cost of performing Work already required by this SOW.

4.2.5 Reservations

1. No payment by the Oversight Agency to the Site Operator shall waive any rights of the Oversight Agency, the Support Agency, or any other agency or the United States, or the State of California, to pursue and obtain any remedy for the Site Operator's failure to satisfactorily comply with any obligation of this SOW except as such rights are otherwise limited by the Consent Decree or SOW.

4.2.6 Antideficiency Act

1. The Site Operator recognizes and acknowledges that any payment obligation or commitment of the Oversight Agency can only be paid from settlement funds or from appropriated funds legally obligated for such purpose. Nothing in this SOW or the Consent Decree shall be interpreted or construed as a commitment or requirement that the Oversight Agency or any other federal or State agency obligate or pay funds in contravention of the Antideficiency Act, 31 U.S.C. Section 1341, or any other applicable provision of federal or State law.

2. The Oversight Agency will not order the Site Operator to perform Work beyond the scope of this SOW unless there are sufficient funds in the Iron Mountain Special Account or other appropriate source to pay for the reasonably expected cost of such Work. In any order to perform Added Scope Work, the Oversight Agency will include the most recent accounting statement from the Iron Mountain Special Account or other appropriate account that indicates whether sufficient funds are available to pay for such Work.

4.3 Option to Restructure O&M Program

1. The "O&M Program" includes the Work as contemplated in this SOW and terminal payment (by others) at the end of the Performance Period to fund O&M and other activities after the Performance Period.

2. At each 10-year interval, or other such time agreeable by the Oversight Agency, the Support Agency, and the Site Operator, the Oversight Agency, the Support Agency, and the Site Operator may agree to restructure the O&M Program by using a portion of the terminal payment or other settlement funds to fund an extension of the Performance Period for an additional 10 years (or other period as agreed by the Oversight Agency, the Support Agency, and the Site Operator). Such an extension would involve deferring all or a portion of the remaining terminal payment and extending the Performance Period on terms acceptable to the Site Operator, the Oversight Agency, and the Support Agency. A decision on whether or not and how to restructure the O&M Program is not subject to Dispute Resolution or judicial review by the Site Operator.

5. Insurance and Indemnity

5.1 Liability and Property Insurance

1. The Site Operator shall maintain the following insurance coverage during the term of this SOW. The limits required by this Section are stated in year 2000 dollars, and shall be adjusted every 5 years based on the Inflation Escalator, and rounded up to the next million dollars of coverage. If the Inflation Escalator exceeds 5 percent, then the Site Operator shall adjust the coverage limits annually until the Inflation Escalator decreases below 5 percent. If, for any reason, these coverages lapse, or are canceled or reduced, the Oversight Agency, in its discretion and after notice to the Site Operator with reasonable opportunity to cure, may purchase such insurance coverage as covers all, or any portion of, the insurance omission, and the Site Operator shall reimburse the Oversight Agency for the premiums paid as Response Costs. However, nothing in the Consent Decree or SOW requires that the Oversight Agency or Support Agency purchase any insurance due to the Site Operator's failure to obtain the insurance coverages required below. The Site Operator shall have the option to meet the limits required by this Section by evidencing umbrella coverage that meets the requirements of this Section with respect to the particular coverage or limit.

5.2 Insurance Certificates

1. Prior to commencing any Work under this SOW, and within thirty (30) days after the renewal date of any required policy, the Site Operator shall provide the Oversight Agency with insurance certificates evidencing the required insurance coverages and additional insured endorsements. The insurance certificates shall be executed by the insurer or its authorized representative and shall provide that the policy(ies) shall not be terminated, nor shall coverage be diminished, without providing the Oversight Agency with written notice thirty (30) days prior to cancellation, termination, or reduction in coverage.

5.2.1 Acceptable Insurers

1. Only insurers acceptable to the Oversight Agency may provide insurance that meets the requirements of this Section. Unless otherwise agreed in writing, such insurers must be rated equal to or better than Bests A, VIII, and must be admitted and authorized to issue insurance in California. The Oversight Agency's agreement to accept a policy or policies that do not meet these requirements is only valid for a single policy year and does not waive the Oversight Agency's right to require subsequent policies to meet all of the requirements of this paragraph.

5.2.2 Commercial General Liability

1. The Site Operator shall obtain and maintain one or more broad-form Commercial General Liability insurance with annual aggregate and per-occurrence limits of not less than $10 million per occurrence and in the aggregate. The policy shall apply separately to each insured and may not exclude coverage for claims by and between insureds. The policy shall be endorsed to provide coverage for contractually assumed liability. The policy shall waive subrogation against any of the Indemnified Parties. The policy shall also name each of the Indemnified Parties as additional insureds using an additional insured certificate that provides coverage equal, or better than, the coverage under ISO Form GC20100397 (1999 Edition). The policy shall not contain an insured versus insured exclusion that applies to the Indemnified Parties.

5.2.3 Vehicle Liability

1. The Site Operator shall obtain and maintain liability insurance covering any automobile, vehicle, or mobile equipment owned, leased, rented, or used by the Site Operator. The policy shall have per-accident limits of not less than $10 million per accident or in the aggregate. The Indemnified Parties shall be named as additional insureds under this policy. The policy shall not contain an insured versus insured exclusion that applies to the Indemnified Parties.

5.2.4 Workers Compensation

1. The Site Operator shall satisfy, or shall ensure that its subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing the activities required by this SOW and the Consent Decree. Prior to commencement of the activities required by this SOW, the Site Operator shall provide to the Oversight Agency certificates of such insurance and a copy of each insurance policy. The Site Operator shall resubmit such certificates and copies of policies each year on the anniversary of the Effective Date of this SOW. If the Site Operator demonstrates by evidence satisfactory to the Oversight Agency and the Support Agency that any subcontractor maintains insurance equivalent to that described above, or insurance covering the same risks but in a lesser amount, then, with respect to that subcontractor, the Site Operator need provide only that portion of the insurance described above which is not maintained by the subcontractor.

5.2.5 Contractor's Pollution Liability

1. The Site Operator shall obtain and maintain Contractor's Pollution Liability insurance to cover claims arising from the discharge or release of hazardous materials, pollution, or contaminants during the course of construction activities. Such insurance shall have

annual limits not less than $5 million per claim and in the aggregate. The Indemnified Parties shall be named as additional insureds under this Policy. The Policy shall not contain an insured versus uninsured exclusion that applies to the Indemnified Parties.

5.2.6 Property Insurance

1. The Site Operator shall obtain and maintain Property All Risk Coverage to cover the repair or replacement costs of real and personal property that may arise from the perils set forth in Section 11(2). The policy shall have annual total limits of $10 million. This coverage shall be in excess of Coverage B of the Policy.

5.2.7 Alternative Insurance Coverages

1. The Oversight Agency recognizes that the Site Operator may be able to obtain insurance that duplicates the coverage(s) provided by one or more of the required insurance policies or that changes in the insurance market may justify a modification to the above requirements. The Oversight Agency may, in its sole discretion, agree to accept alternative insurance coverages (including but not limited to any modifications to the above insurance requirements) proposed by the Site Operator, provided such alternative coverages are substantially equivalent to the required insurance policies. Unless otherwise agreed by the Oversight Agency, the Oversight Agency's agreement is for a single policy year, and the Oversight Agency retains the right to require that insurance provided for subsequent policy years meets all of the requirements of this Section.

5.2.8 Insurance Market Disruption

1. If, as a result of changes in the insurance markets, a required insurance coverage is unavailable, the Site Operator shall not be in breach because of the inability to procure that required insurance.

5.3 Indemnity

5.3.1 Indemnified Parties

1. The parties to be indemnified by the Site Operator are:

   a. The United States, the Oversight Agency (when it is an agency of the United States), the Support Agency (when it is an agency of the United States), and their respective political subdivisions, departments, and agencies; the employees, consultants, representatives, and agents of the Oversight Agency, the Support Agency, and the United States, and their respective officers, directors, partners, and employees; and

   b. The State, the Oversight Agency (when it is a State agency[ies]), the Support Agency (when it is a State agency[ies]), and all of their agencies, representatives, agents, consultants, and respective officials, officers, directors, partners, and employees acting within the scope of their duties and in their official capacities.

2. These parties are collectively referred to as the "Indemnified Parties." The indemnification afforded by this Section applies individually to each Indemnified Party, and the conduct of an Indemnified Party shall not be attributed to any other Indemnified Party for the purposes of determining the Indemnified Party's relative degrees of fault, if any, pursuant to Section 5.3.2.

5.3.2 Indemnification

1. To the fullest extent permitted by law, the Site Operator agrees to defend, indemnify and hold harmless the Indemnified Parties, and each of them, from and against any and all claims, liability, loss or damage, including attorneys' fees, consultant fees, legal costs and other costs of defense, and including injury or death of the Site Operator's employees, that arises from, or is alleged to arise from, the Site Operator's: (a) negligence or willful misconduct; (b) breach of any obligation of the Consent Decree and SOW; or (c) failure of the Site Operator to comply with any order, regulation, ordinance, statute, constitution, or any legal decision having the force of law, except to the extent that the claim, liability, loss or damage is caused by the sole negligence or willful misconduct of the entity or person indemnified.

2. The Site Operator agrees to defend the Indemnified Party(ies), as provided in Section 5.3.5, provided, however, that the Site Operator's duty to defend shall terminate when it is judicially determined (after exhaustion of all appeals) that the Site Operator has no liability with respect to the asserted claim. Except for defense and indemnification claims asserted by Indemnified Parties, nothing contained in the indemnification obligations is intended to, nor shall it be construed to, waive the Site Operator's defenses based on the protections afforded the Site Operator pursuant to Section 119 of CERCLA and Section 25400 of the California Health & Safety Code to the extent applicable by law.

5.3.3 Insurance Unaffected

1. Nothing herein shall affect any Indemnified Party's ability to make a claim upon any of the insurance provided pursuant to Section 5.1 or the financial assurance provided pursuant to Section 7.13 or any other policy.

5.3.4 Notification and Tender

1. Unless earlier barred by all applicable statutes of limitations, as a condition precedent to indemnification, an Indemnified Party must submit a written demand for indemnification to the Site Operator (a) for claims asserted by third-parties against an Indemnified Party, within one hundred eighty (180) days of the date the Indemnified Party receives from a third party a written demand for payment of, or other written notice of a claim for liability with respect to a damage, loss, or expense suffered by the third party; and (b) for claims for a loss sustained by an Indemnified Party, within two (2) years of the date the Indemnified Party knew or reasonably should have known of the loss.

5.3.5 Counsel

1. The Site Operator shall pay for and appoint counsel reasonably acceptable to the person or entity being defended, and no counsel appointed may represent, or may have represented, parties with conflicting interest unless the parties, after full and complete written disclosure, consent to such representation.

5.3.6 Continuing Obligation

1. Subject to Section 5.3.4 hereof, the Site Operator shall defend and indemnify the Indemnified Parties only with respect to claims reported to the Site Operator in writing within 5 years of the termination of the Site Operator's obligations under this SOW.

5.3.7 No Third Party Benefit

1. Nothing in the Consent Decree or this SOW creates or confers or is intended to create or confer on any third party any right or benefit or is admissible or otherwise useable by any third party for any purpose in any civil, criminal or administrative action, including to establish any standard of care or the breach thereof.

6. Management Plans and Reports

6.1 Management Plan Requirements

1. In general, in developing management plans and reports, the Site Operator may rely on the existing site management plans and reporting formats to the extent they are applicable and meet the requirements of this SOW.

2. The Site Operator developed and submitted the following plans and reports to the Oversight Agency for Oversight:

   a. O&M Plan;

   b. Site Health and Safety Plan (this plan is subject to agency review and comment but not agency approval); and

   c. Quality Assurance Project Plan

3. The Site Operator shall develop and submit the following plans and reports to the Oversight Agency for Oversight Agency review and approval pursuant to Section. 7.11, *Oversight Agency Approval of Plans and Submissions:*

   a. Annual Operations Work Plan;

   b. Landfill Management Report and Plan.

4. The Site Operator shall develop and submit the following reports to the Oversight Agency for Oversight Agency review and approval pursuant to Section 7.11, *Oversight Agency Approval of Plans and Submissions.* These monthly reports shall be deemed to be approved unless the Oversight Agency notifies the Site Operator otherwise within sixty (60) days of receipt. Approval of a Monthly Progress Report shall not indicate approval or disapproval of costs or expenses contained in such reports.

   a. Monthly Progress Reports; and
   b. RD/RA Monthly Progress Reports.

5. All reports and other documents submitted by the Site Operator to the Oversight Agency that purport to document the Site Operator's compliance with the terms of this SOW and Consent Decree shall be signed by an authorized representative of the Site Operator.

6. Unless otherwise specified in this SOW, the Consent Decree or written agreement by the Oversight Agency, the Site Operator shall submit three copies of all plans, reports, and data required by this SOW (or any other approved plans) to the Oversight Agency in accordance with the schedules set forth. The Site Operator shall simultaneously submit one copy of all such plans, reports, and data to the Support Agency.

6.2 O&M Plan

1. The Site Operator shall develop the O&M Plan for Oversight Agency approval. The O&M Plan shall provide a comprehensive plan for Site O&M and shall comply with the requirements of this Section.

2. IT Iron Mountain Operations LLC submitted the *Operation and Maintenance Plan, Iron Mountain Operations, LLC, Redding, Shasta County, California* to the Oversight Agency in April 2001. The O&M Plan, or any future revisions made per the requirements of Section 6 of this SOW that supersede the 2001 O&M Plan, shall be incorporated into this SOW.

3. The O&M Plan shall, at a minimum:

   a. Describe in detail each of the following O&M Units and each of the maintenance and inspection requirements for each Unit, including, at a minimum, the requirements identified in Section 9:

      i. Minnesota Flats Treatment Plant;
      ii. Treatment plant ancillary facilities;
      iii. Roads;
      iv. AMD collection and conveyance systems;
      v. Brick Flat Pit;
      vi. Subsidence areas;
      vii. Mine workings;
      viii. Clean water diversions;
      ix. Boulder Creek Tailings Dam;
      x. Slickrock Creek Basin;
      xi. Boulder Creek slide area;
      xii. Sampling program;
      xiii. Security systems;
      xiv. Offsite facilities; and
      xv. Waste disposal facilities.

   b. Provide an effective operations and maintenance program for Routine and Non-routine O&M (Section 9), Emergency Response (Section 10), and Response to Extreme Events (Section 11) Work activities.

   c. Contain a maintenance program schedule and checklist for all O&M Unit Components in each O&M Unit and all equipment. The Site Operator shall specify maintenance procedures, maintenance schedules, equipment replacement schedules, and compliance procedures for each of the O&M Units, O&M Unit Components and all other equipment. The O&M Plan shall include a detailed inspection checklist to be used to document inspections and to propose corrective actions. The schedule shall identify at a minimum all regularly scheduled inspections, maintenance activities, and reporting activities. This requirement does not apply to office equipment such as fax machines, telephones, and other equipment as agreed by the Oversight Agency.

d. Describe the maintenance records program that documents compliance with the maintenance program required in this SOW.

e. Include a description of the Standard Operation and Safety Procedures ("SOSP") for all process equipment at the MFTP and all equipment at other O&M Units.

f. Require that the Site Operator follow equipment manufacturers' recommendations pertaining to operation and maintenance of all equipment at the Site unless additional action is necessary to meet the Performance Standards or other requirements of this SOW. The Site Operator may seek and secure approval from the Oversight Agency for alternative procedures. If the Site Operator intends to modify the manufacturer's recommendations, the Site Operator shall, in the draft O&M Plan, clearly identify the proposed modification and the justification for the modification. This requirement does not apply to office equipment such as fax machines, telephones, and other equipment as agreed in writing by the Oversight Agency.

g. Provide sufficient flexibility such that the Site Operator may request that specific obligations be deferred or waived, should the Site Operator determine that certain tasks are not needed for a specific period of time. The O&M Plan shall also provide flexibility for rescheduling of operation and maintenance activities to accommodate other activities at the Site, including, but not limited to, response actions by the Oversight Agency, upon receipt of a request to reschedule the activity by the Oversight Agency.

h. Require that each contractor (contractors) selected by the Site Operator to perform a portion of this SOW have demonstrated relevant expertise in construction, operations, and maintenance of facilities similar to those at the Site. Provide that the Site Operator shall provide a copy of the relevant portions of this SOW to each person representing the Site Operator with respect to the Site or the Work and shall condition all contracts and subcontracts in conformity with the terms of this SOW.

i. Require the Site Operator to submit to the Oversight Agency, for Oversight Agency approval, draft plans, if necessary, and specifications for repair or replacement of all individual pieces of equipment, not identical in make and model to existing equipment, that costs more than $ 25,000 (adjusted based on the Inflation Escalator). If the proposed equipment item is not identical in make and model to the existing equipment item that will be repaired or replaced, the Site Operator shall submit engineering calculations, manufacturer's cut-sheets, or other information that demonstrates that the proposed equipment is of equal or superior quality and functionality as the original equipment. Upon approval by the Oversight Agency, the Site Operator shall conduct the Work necessary to replace or repair the equipment.

j. Require the Site Operator to submit to the Oversight Agency for Oversight Agency review and approval, draft plans and specifications for repair or replacement of all non-equipment O&M Unit Components that cost more than $50,000 (adjusted based on the Inflation Escalator). O&M Unit Components include, but are not limited to, roadways, buildings, structures, earth structures, dams, bridges, sludge

drying beds, geotextiles, culverts, impact structures, water-holding structures, water diversion structures, or other components listed in Section 9. If the proposed repair or replacement does not return the O&M Unit Component substantially to its original condition, the Site Operator shall submit engineering calculations or other information that demonstrates that the proposed repair or replacement is 1) of equal or superior quality and functionality as the original O&M Unit Component and 2) of equal durability as the original O&M Unit Component, taking into consideration the expected useful life of the component. Upon approval by the Oversight Agency, the Site Operator shall conduct the Work necessary to replace or repair the O&M Unit Component.

k. Require the Site Operator to submit to the Oversight Agency, for Oversight Agency review and approval, draft plans and specifications for any modifications to the Site that would alter the IMM Remedy or that would modify the approved management plans listed in Section 6.1.

4. Notwithstanding the terms of any contract, the Site Operator is responsible for compliance with this SOW and for ensuring that its contractors, subcontractors, and agents comply with this SOW and perform any Work in accordance with this SOW.

5. Notwithstanding the requirements of this Section to submit draft plans and specifications to the Oversight Agency for Oversight Agency approval, the Site Operator shall conduct emergency repairs, in an effective manner, as necessary, in response to all failures at the Site to ensure continuous operation of the IMM Remedy.

6. The provisions of this Section do not relieve the Site Operator of the obligations imposed by any other provision of this SOW.

6.3 Annual Operations Work Plan

1. By May 1 of each year, or other agreed-upon date, the Site Operator shall submit for Oversight Agency review and approval a draft Annual Operations Work Plan. This plan will provide a detailed plan for the operation, maintenance, and inspection activities planned for the twelve (12)-month period beginning on June 1 of that year ("next year"). The draft Annual Operations Work Plan shall address all activities related to O&M, Remedial Designs, Remedial Actions, modifications to the Site implemented during the previous plan year, modifications to the Site planned for the next year, and all other information necessary to enable the Oversight Agency to effectively evaluate whether the Performance Standards have been and will be met.

2. Except as provided in Section 6.3(3) below, the draft Annual Operations Work Plan shall:

   a. Provide an adequate description for each maintenance problem or repair item experienced in the previous twelve (12)-month period, including, but not limited to, equipment or facility failures and storm damage to Site facilities that require repair and the steps to be taken to remedy those problems;

   b. Provide conceptual designs and specifications for each proposed equipment or storm damage repair item identified in Section 6.2(5)(i) and 6.2(5)(j), together with supporting engineering calculations and other information; and

c. Identify and provide a schedule for all routine inspections and maintenance activities to be performed.

3. The following items are not subject to the reporting requirements for the draft Annual Operations Work Plan:

   a. The replacement of belts on drives between motors and the equipment driven (e.g., lime slurry pumps and slaker drums); slaker screens; filters for water and oil; local level indicators on tanks and silos; hoses for lime transfer from trucks; pH probes; belt guards; light bulbs; and minor repairs to buildings and building equipment;

   b. Maintenance tasks for remedying plugging of lime transfer piping;

   c. Replacement of valves and miscellaneous equipment costing less than $1,000;

   d. Removing minor rockfalls that partially block the roads and drainage ditches;

   e. Repairing minor road erosion that does not interfere with road traffic or normal access; and

   f. Other items agreed to in writing by the Oversight Agency.

4. After submittal of the draft Annual Operations Work Plan, the Site Operator shall participate in a telephone conference call to present and discuss the draft Annual Operations Work Plan.

5. The Site Operator shall incorporate the Oversight Agency comments (if any) on the draft Annual Operations Work Plan, including revisions to the conceptual designs and specifications, within thirty (30) days from the receipt of Oversight Agency's comments. If the Site Operator disputes any of the Oversight Agency's written comments, the Site Operator may invoke the Dispute Resolution procedure of Section XIX of the Consent Decree, but the Site Operator shall incorporate all undisputed written comments into a draft final Annual Operations Work Plan. The Site Operator shall submit the draft final Annual Operations Work Plan to the Oversight Agency for review and approval. Upon Oversight Agency approval, the draft final Annual Operations Work Plan, including the draft repair designs and specifications (but excluding major projects covered by the RD/RA requirements in Section 12, *Remedial Design*, and Section 13, *Remedial Action*), becomes final. The final Annual Operations Work Plan, including the final repair designs and specifications, is incorporated into this SOW as a requirement of this SOW and shall be an enforceable part of this SOW.

6. Upon Oversight Agency approval of the draft final Annual Operations Work Plan, the Site Operator shall perform, in accordance with the approved plan, the operations, maintenance, and inspection activities, and implement the approved repairs. The Site Operator shall not commence a repair unless the repair is approved in the then-current Annual Operations Work Plan, otherwise approved by the Oversight Agency, or not subject to approval in the Work Plan (due to the scope of the repair, emergency conditions, or some other factor). Unless otherwise approved by the Oversight Agency, the Site Operator shall prepare and retain Record Drawings for each repair involving water, electrical, pipelines that have been buried, and any project that costs more than $100,000 (adjusted by the Inflation Escalator).

7. The Annual Operations Work Plan shall include sections specific to the condition of each of the O&M Units, the competency and/or capacity of the O&M Units to meet the Performance Standards and other requirements of this SOW, and the requirements for repairs, upgrades, or replacement of O&M Unit Components.

8. The last five Annual Operations Work Plans required to be submitted during the Performance Period (i.e., the plans required to be submitted on May 1, 2025, May 1, 2026, May 1, 2027, May 1, 2028 and May 1, 2029) shall each include a transition plan identifying the Non-Routine O&M activities necessary for all O&M Units and O&M Unit Components to meet or exceed the applicable Transition Condition (as defined in Section 8.2) described in the Final Asset Management Plan (as defined in Section 8.2), and shall specify which of those activities are planned for the period covered by that Annual Operations Work Plan. The transition plan in the final Annual Operations Work Plan required to be submitted during the Performance Period (i.e., the plan required to submitted on May 1, 2029 ("Final Annual Operations Work Plan") shall specify as planned activities for the period covered by the Final Annual Operations Work Plan all remaining Non-Routine O&M activities necessary for all O&M Units and O&M Unit Components to meet the Performance Standards set forth in subparagraph 2(f) of Section 8.2 by the end of the Performance Period.

6.4 Landfill Management Report and Plan

1. The Landfill Management Report and Plan (LMRP) is an annual report that enables the Oversight Agency to effectively evaluate whether the Brick Flat Pit (BFP) landfill was properly managed, consistent with the concept design for a dry landfill, over the preceding twelve (12)-month period, and that the landfill will be properly managed as a dry landfill over the upcoming twelve (12)-month period. Section 8.8 presents the Performance Standards for the BFP landfill. Section 9.7.1 presents a description of the BFP O&M Unit.

2. The Site Operator shall detail in the LMRP the Site Operator's proposed approach for ensuring compaction and placement requirements and for operating BFP as a dry landfill.

3. By November 30 of each year, the Site Operator shall provide to the Oversight Agency, for Oversight Agency review and approval, the LMRP. This plan provides operation details for the BFP sludge disposal site and the Sludge Drying Beds for the twelve (12)-month period ending on October 31 of that year and the planned operations for the twelve (12)-month period beginning on November 1 of that year. In the event that a sludge haul occurs during the month of November, the Site Operator shall provide data related to that sludge haul as a supplement to the annual report. The Site Operator shall provide such supplemental data by December 31 of the year in which the November sludge haul occurs.

4. With respect to operations from the preceding twelve (12)-month period ending on October 31 of that year, the LMRP shall contain at a minimum the following information:

    a. An updated as-built drawing of the BFP landfill, with updated topography;

b. A discussion of the manner in which sludge was dewatered, excavated, hauled, and placed in the BFP landfill, landfill operations practices, and any problems encountered during sludge dewatering, excavation, haulage and placement, or landfill operations;

c. A discussion of repairs that were made to sludge dewatering or BFP landfill facilities, or construction activities that were undertaken to modify sludge dewatering and BFP landfill facilities; and

d. At a minimum, the following flow, analytical, and geotechnical data:

   i. Sludge influent flow rates to sludge drying beds (to be reported as a daily average);

   ii. Filtrate flow rates from sludge drying beds and BFP (to be reported as a daily average);

   iii. Filtrate water quality from sludge drying beds (to be reported as a composite daily average) and BFP (to be reported as a daily average);

   iv. Sludge volume, specific gravity, solids contents of sludge hauled to BFP (to be reported in a manner consistent with the Operations and Maintenance Plan for at least six locations from each sludge dewatering bed);

   v. Total volume of sludge in BFP and revised stage storage/elevation curves; and

   vi. Results of routine analytical testing conducted on BFP filtrate and seepage discharge. Analytical testing shall comply with the procedures, requirements, and standards set forth in Section 14, *Performance Standards and Verification Plan.*

e. A discussion of areas of deviation of the revised LMRP with the previous LMRP;

f. Any inconsistencies between the activities or operations projected in the previous LMRP and the activities or operations actually undertaken during the projected period;

g. With respect to future operations for the twelve (12)-month period beginning on November 1 of the year, the Landfill Management Report and Plan shall contain at a minimum the following information:

   i. Plan for operating BFP as a dry landfill, including a description of sludge placement and landfill operations practices to be employed;

   ii. Identification of the area of the landfill to be used for the placement of seasonal sludge production;

   iii. Specific identification of each planned construction activity to repair or modify sludge dewatering or landfill facilities and any changes to sludge dewatering or landfill operations practices;

   iv. A discussion of any areas of concern; and

v. A complete listing of the analytical and geotechnical testing and methods that will be completed prior to the sludge haulage, during the next sludge haulage, and on a routine basis.

6.5 SCRR Startup/Shakedown Work Plan

1. The Draft *Slickrock Creek Retention Reservoir, Startup and Shakedown Plan* was prepared by CH2M HILL for the Oversight Agency in February 2004. The Startup and Shakedown Plan detailed the tests and procedures to be performed during the startup and shakedown period for the retention reservoir including the planned flow discharge to the MFTP and testing all systems for controlling the operation of the reservoir.

2. The Site Operator provided comments on the Startup and Shakedown Plan in March 2004. The Final *Slickrock Creek Retention Reservoir, Startup and Shakedown Plan* was issued by the Oversight Agency in March 2004. The results of the initial filling and the startup and shakedown performance testing are provided in Appendix E, *Startup and Shakedown Performance Testing*, of the *ROD 4 Remedial Action Report, Slickrock Creek Retention Reservoir* (CH2M HILL, 2004).

6.6 Site Health and Safety Plans

1. The Site Operator contracted SHN Consulting Engineers to prepare the *Health and Safety Plan* and *Injury and Illness Prevention Program* to protect the health and safety of individuals who will be on the Site during performance of the Work. The plan shall address O&M, RD, and RA activities. The Site Health and Safety Plan shall conform to the applicable Occupational Safety and Health Administration and EPA requirements, including but not limited to the following:

   a. 54 Fed. Reg. 9294;

   b. CERCLA Sections 104(f) and 111(c) (6);

   c. EPA Order 1440.2—Health and Safety Requirements for Employees Engaged in Field Activities;

   d. EPA Order 1440.11—Respiratory Protection;

   e. EPA Occupational Health and Safety Manual;

   f. EPA Standard Operating Safety Guide Manual (OSWER Directive 9285.1-02; July 1988);

   g. EPA Field Standard Operating Procedures Manual: No. 9—Site Safety Plan (OSWER Directive 9285.2-05; April 1985);

   h. Federal Mine Safety and Health Act, 30 U.S.C. Section 801.962;

   i. Part 1910 of 29 C.F.R. revised July 1, 1982, OSHA Standards for General Industry;

   j. National Institute of Occupational Safety and Health Manual of Analytical Methods, Volumes I-VII;

k. Threshold Limit Values (TLV) for Chemical Substances and Physical Agents in the Work Environment with Intended Changes adopted by the American Conference of Governmental Industrial Hygienists, latest edition;

l. ANSI Z88.2—1980, American National Standard Practices for Respiratory Protection;

m. Air Sampling Instruments for Evaluation of Atmospheric Contaminants, 6th Edition, 1983, American Conference of Governmental Industrial Hygienists; and

n. Appropriate State health and safety statutes.

2. The Site Operator shall update plans on an as-needed basis to comply with current health and safety requirements.

6.7 Monthly Progress Reports

1. In addition to any other requirement of this SOW and the Consent Decree, and unless the Site Operator and Oversight Agency agree in writing to a different reporting schedule, the Site Operator shall submit to the Oversight Agency and the Support Agency Monthly Progress Reports that include the following:

   a. A description of the actions that have been taken to comply with this SOW during the prior month;

   b. A description of all Work planned for the next month with schedules;

   c. A detailed description of equipment failures that occurred during the preceding month, all steps taken to respond to the failure, whether a release of untreated AMD or other impact occurred as a result of the failure, and all steps that were or will be taken to avoid the risk of such failure in the future;

   d. Analytical test results and flow data designated in Section 14;

   e. A description of any problems encountered or anticipated that have affected or might affect the performance of O&M activities or other activities pursuant to this SOW and Consent Decree, together with a description of efforts made to resolve or mitigate those problems;

   f. Any modifications to any Work Plans or other schedules that the Site Operator has proposed to the Oversight Agency;

   g. A download of the treatment plant operations data for the previous month. The download shall contain historical process information (including flow, pH, water elevation, and other data) that is currently contained in the Wonderware software utilized to operate the treatment plant and related facilities; and

   h. A certificate executed by the Site Operator's Project Manager, with the power to bind the Site Operator, warranting that, during the billing period, the Site Operator has performed all of its obligations under this SOW, and a summary in a form acceptable to the Oversight Agency detailing the costs expended during that period with respect to the Site and certifying that such sums were actually expended.

2. In general, the Site Operator may continue use of the monthly report format used by the former site operator during 1999-2000 as an acceptable format, with revisions to reflect additional reporting requirements consistent with this SOW.

3. The Site Operator shall submit these progress reports to the Oversight Agency and the Support Agency by the 21st day of every month following the commencement of activities under this SOW and continuing until termination pursuant to Section 7.14. If requested by the Oversight Agency or the Support Agency, the Site Operator shall also provide briefings to the Oversight Agency and the Support Agency to discuss issues concerning O&M activities or other activities pursuant to this SOW and Consent Decree.

4. Unless otherwise agreed by the Oversight Agency and the Site Operator, the Site Operator shall submit the Monthly Progress Report in hard copy and electronic version.

5. At the request of the Oversight Agency or Support Agency, the Site Operator shall send the Monthly Progress Report to representatives and consultants of the Oversight Agency or Support Agency.

6. Upon the occurrence of any event during performance of O&M activities or other activities pursuant to this SOW and the Consent Decree that the Site Operator is required to report pursuant to Section 103 of CERCLA or Section 304 of the Emergency Planning and Community Right-to-know Act (EPCRA), the Site Operator shall, within twenty-four (24) hours of the onset of such event, orally notify the Oversight Agency Project Manager and the Support Agency Site Manager, or the Alternate Oversight Agency Project Manager (in the event of the unavailability of the EPA Project Coordinator), or, in the event that neither the Oversight Agency Project Manager nor Alternate Oversight Agency Project Manager is available, the Emergency Response Section, Region 9, United States Environmental Protection Agency. These reporting requirements are in addition to the reporting required by CERCLA Section 103 or EPCRA Section 304.

7. Within twenty (20) days of the onset of such an event, the Site Operator shall furnish to the Oversight Agency a written report, signed by the Site Operator's Site Manager, setting forth the events that occurred and the measures taken, and to be taken, in response thereto. Within thirty (30) days of the conclusion of such an event, the Site Operator shall submit a report setting forth all actions taken in response thereto.

6.8 Quality Assurance Project Plan ("QAPP")

1. In general, the Site Operator may, for the development of its own Quality Assurance Project Plan(s) ("QAPP(s)") rely on the existing QAPPs in use for various projects and procedures at the Site, to the extent they are applicable and meet the requirements of this SOW.

2. The Site Operator shall use quality assurance, quality control, and chain-of-custody procedures for all samples that may be required to be taken under this SOW or O&M Plan in accordance with:

   a. *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operation*, (EPA QA/R5);

b. *Preparing Perfect Project Plans*, QAMS-005/80; and (EPA /600/9-88/087); and

c. Subsequent amendments to such guidelines upon notification by the Oversight Agency to the Site Operator of such amendment. Amended guidelines shall apply only to procedures conducted after such notification.

3. Prior to the commencement of any monitoring project under this SOW or RA activities with construction costs exceeding $50,000 (adjusted based on the Inflation Escalator), the Site Operator shall submit to the Oversight Agency for approval a QAPP that is consistent with this SOW, the NCP, and applicable guidance documents.

4. If relevant to the proceeding, the Parties agree that validated sampling data generated in accordance with the QAPP(s) and reviewed and approved by the Oversight Agency shall be admissible as evidence, without objection, in any proceeding under the Consent Decree. The Site Operator shall ensure that the Oversight Agency, State personnel, and their authorized representatives are allowed access at reasonable times to all laboratories utilized by the Site Operator for analyses.

5. The Site Operator shall ensure that the laboratories it utilizes analyze all samples submitted by the Oversight Agency pursuant to the QAPP for quality assurance monitoring. The Site Operator shall ensure that such laboratories perform all analyses according to accepted EPA methods for the analysis of samples taken pursuant to this SOW and the Consent Decree.

6. Accepted EPA methods consist of those methods which are documented in the "Contract Lab Program Statement of Work for Inorganic Analysis" and the "Contract Lab Program Statement of Work for Organic Analysis," dated February 1988, and any amendments made thereto during the course of the implementation of this SOW. The Site Operator shall ensure that all laboratories it uses for analysis of samples taken pursuant to this SOW or O&M Plan participate in an EPA or EPA-equivalent QA/QC program. The Site Operator shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this SOW or the Consent Decree will be conducted in accordance with the procedures set forth in the QAPP approved by EPA.

7. Upon request, the Site Operator shall allow split or duplicate samples to be taken by the Oversight Agency and the Support Agency or their authorized representatives. The Site Operator shall notify the Oversight Agency and the Support Agency not less than ten (10) days in advance of any sample collection activity unless shorter notice is agreed to by the Oversight Agency. The notification requirement does not apply to sampling activities scheduled in the O&M Plan, the Annual Operations Work Plan, the LMRP, and the Monthly Progress Reports. The notification requirement does not apply to sampling activities associated with process control at the treatment plant. For sampling activities scheduled in the O&M Plan, the Annual Operations Work Plan, the LMRP, and the Monthly Progress Reports, the Site Operator shall, at the request of the Oversight Agency, coordinate with the Oversight Agency so that the Oversight Agency can schedule personnel for obtaining split samples.

8. The Oversight Agency and the Support Agency, or their authorized representatives, at their own cost and expense, shall have the right to take any additional samples that the Oversight Agency or the Support Agency deems necessary. Upon request, the Oversight Agency and the Support Agency shall allow the Site Operator to take, split or duplicate samples of any samples it takes as part of the Oversight Agency's oversight of the Site Operator's implementation of O&M activities.

9. The Site Operator shall submit to the Oversight Agency and the Support Agency three copies of the results of all sampling and/or tests or other data obtained or generated with respect to the Site and/or the implementation of this SOW or O&M Plan unless the Oversight Agency agrees otherwise.

10. Notwithstanding any provision of this SOW and the Consent Decree, the United States and the State hereby retain all of their information-gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

11. IT Iron Mountain Operations LLC submitted the 2001 *Quality Assurance Project Plan, Iron Mountain Operations, LLC, Redding, Shasta County, California* to the Oversight Agency in April 2001.

6.9 Monthly RD/RA Progress Reports

1. In general, the Site Operator may rely on the format of historic RD/RA reports for the development of its own Monthly RD/RA Reports, to the extent they are applicable and meet the requirements of this SOW.

2. The Site Operator shall submit Monthly Remedial Design/Remedial Action (RD/RA) Progress Reports (on the 21st day of each month for activities during the previous month) for Site RD/RA activities to repair, reconstruct, or replace any component of the IMM Remedy that is expected to cost in excess of $50,000 (adjusted based on the Inflation Escalator).

3. For an RD/RA activity to repair, reconstruct, or replace any facility component of the IMM Remedy that is expected to cost more than $50,000 (adjusted based on the Inflation Escalator), but less than $250,000 (adjusted based on the Inflation Escalator), the Monthly RD/RA Progress Report shall contain the following information for each such facility component RD/RA activity:

   a. Project Identifiers

      i. Project description;
      ii. Design and/or construction subcontractor(s);
      iii. The Site Operator's construction management and inspection staff; and
      iv. Subcontractor(s) construction management and field supervision staff.

   b. Progress Payment

      i. Original contract amount;
      ii. Amount paid this month;
      iii. Amount paid to date; and

iv. Changes of contract price status.

c. Schedule, Submittals, and Sequence of Work;

i. Compilation of daily inspection reports for each Work activity;
ii. Compilation of weekly inspection reports for each Work activity;
iii. Work completed for previous month;
iv. Work scheduled for next month; and
v. Percentage complete to date.

d. Delivery and inspections:

i. Inspection quality control reports; and
ii. Construction material testing results.

4. For RD/RA activities to repair, reconstruct, or replace facility components of the IMM Remedy that are expected to cost $250,000 or more each (adjusted by the Inflation Escalator), the Site Operator shall include the following information in the Monthly RD/RA Progress Reports:

a. Project Identifiers:

i. Project description;
ii. Design and/or construction subcontractor(s);
iii. The Site Operator's construction management and inspection staff; and
iv. Subcontractor(s) construction management and field supervision staff.

b. Progress Payment:

i. Original contract amount;
ii. Amount paid this month;
iii. Amount paid to date;
iv. Percentage complete to date;
v. Changes of contract price status;
vi. Potential modifications;
vii. Attachment-Monthly Updated Schedule of Values; and
viii. Attachment-Monthly Updated Change Order Log.

c. Schedule, Submittals, and Sequence of Work:

i. Compilation of daily inspection reports for each Work activity;
ii. Compilation of weekly inspection reports for each Work activity;
iii. Work completed for previous month;
iv. Work in progress;
v. Work scheduled for next month;
vi. Substantially completed facilities;
vii. Milestones achieved this month;
viii. Change of contract times status;
ix. Potential progress and weather delays;
x. Attachment-Monthly Updated Project Progress Schedule; and
xi. Attachment-Monthly Update Submittal Log.

d. Delivery and Inspections:

   i. Material and equipment delivery status;
   ii. Inspection quality control reports; and
   iii. Construction material testing results.

e. Health and Safety:

   i. Minor accidents or injuries;
   ii. Lost-time accidents or injuries;
   iii. Weekly toolbox meetings; and
   iv. General site housekeeping.

f. Coordination and Other Items:

   i. Coordination and conflicts;
   ii. O&M manual development status (as required);
   iii. Operation training plan (as required);
   iv. Manufacturer's services (as required);
   v. Startup and shakedown activities (as required);
   vi. Visitors onsite this month; and
   vii. Record of document development.

5. Based on the nature of the RD/RA project, the Oversight Agency may, in its sole discretion, elect to waive some or all of the requirements contained in this Section.

6. Except as otherwise provided in the Consent Decree or this SOW, the Oversight Agency and Support Agency shall handle any data which is claimed by the Site Operator to be confidential business information consistent with the applicable federal or State law in the manner required by applicable federal or State law.

6.10 Modification of Work Plans

1. The Site Operator is responsible for ensuring that the management plans are current and reflect the experience gained during plant operation. If, as a result of experience gained from plant operation, the Site Operator comes to believe that the project Performance Standards or monitoring procedures should be modified, the Site Operator may submit a request to the Oversight Agency to approve a change in the standards or procedures, or may submit a revised management plan incorporating the Site Operator's proposed modifications to the Oversight Agency for review and approval. The request or proposed modified management plan shall contain sufficient information to allow the Oversight Agency to determine the appropriateness of the requested changes. Revised management plans shall supersede any previously issued management plan referenced in this SOW. A decision of the Oversight Agency regarding modification of Performance Standards pursuant to this paragraph shall not be subject to Dispute Resolution or judicial review.

2. If the Oversight Agency determines that modification to the Work specified in this SOW, and/or in Work Plans developed pursuant to this SOW, is necessary to achieve and maintain the Performance Standards or other requirements of this SOW or to maintain the effectiveness of the remedial actions implemented pursuant to RODs 1

through 4, the Oversight Agency may require that such modification be incorporated in such Work Plans; provided, however, that a modification may only be required pursuant to this Paragraph to the extent that it is consistent with this SOW. The Oversight Agency may modify the Performance Standards or add new Performance Standards, but only as provided in accordance with Section 8.1(2) and 8.1(3) of this SOW.

3. If the Site Operator objects to any modification determined by the Oversight Agency to be necessary pursuant to this Section, the Site Operator may seek Dispute Resolution pursuant to Section XIX (Dispute Resolution) of the Consent Decree and performance of the Work in dispute shall be governed by Section 7.12 of this SOW. If the Site Operator invokes Dispute Resolution, the Work Plan shall be modified in accordance with final resolution of the dispute.

4. The Site Operator shall implement any Work required by any modifications incorporated in the Work Plans developed pursuant to this SOW in accordance with this Section.

5. If in the opinion of the Oversight Agency, the Site Operator's actions are not sufficient to meet the requirements of this SOW or any Work Plan submitted by the Site Operator, the Oversight Agency may direct the Site Operator to take additional steps to implement this SOW or Work Plan. The Site Operator shall proceed to comply with the directive(s). The Site Operator may object to the directive(s) and seek annulment or modification of the directive(s) through the Dispute Resolution procedures and performance of the Work in dispute shall be governed by Section 7.12 of this SOW.

6.11 Offsite Shipment

1. All materials removed from the Site shall be disposed of or treated at a facility approved by the Oversight Agency's Project Manager and in accordance with Section 121(d)(3) of CERCLA, 42 U.S.C. § 9621(d)(3); with the U.S. EPA "Revised Offsite Policy," OSWER Directive 9834.11, November 13, 1987; and with all other applicable federal (including the U.S. Department of Transportation), State, and local requirements.

2. The Site Operator shall, prior to any offsite shipment of Waste Material from the Site to an out-of-state waste management facility, pursuant to the O&M Plan developed pursuant to this SOW or any modification thereto, provide written notification to the appropriate state environmental official in the receiving facility's state and to the Project Coordinator of such shipment of Waste Material. However, this notification requirement shall not apply to any offsite shipments when the total volume of all such shipments will not exceed 10 cubic yards.

3. The Site Operator shall include in the written notification required by Section 6.11(2) the following information, where available: (a) the name and location of the facility to which the Waste Material are to be shipped; (b) the type and quantity of the Waste Material to be shipped; (c) the expected schedule for the shipment of the Waste Material; and (d) the method of transportation. The Site Operator shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

4. With respect to shipments to out-of-state facilities, the identity of the receiving facility and state will be determined by the Site Operator following Oversight Agency approval of the O&M Plan or any modification thereto. The Site Operator shall provide the information required by Section 6.11(3) at least sixty (60) days prior to planned shipment of the Waste Material.

7. Site Coordination

7.1 Project Manager

1. All communications, whether written or oral, from the Site Operator to the Oversight Agency shall be directed to the Oversight Agency's Project Manager (PM) or Alternate Project Manager. The Site Operator shall submit to the Oversight Agency three copies of all documents, including plans, reports, and other correspondence, which are developed pursuant to this SOW, and shall send these documents by certified mail, overnight mail, or other method such as electronic transmission agreed to by the Oversight Agency. EPA's Project Manager: United States Environmental Protection Agency, Region 9, 75 Hawthorne Street, SFD-7-2, San Francisco, California 94105. Telephone Number (415) 972-3265. The Oversight Agency Alternate Project Manager: United States Environmental Protection Agency, Region 9, 75 Hawthorne Street, SFD-7-2, San Francisco, California 94105. Telephone Number: (415) 972-3148.

2. The Oversight Agency may change its PM and Alternate PM. If the Oversight Agency changes its PM or Alternate PM, the Oversight Agency will inform the Site Operator in writing of the name, address, and telephone number of the new PM (or alternate). A change in PM and Alternate PM is not subject to Dispute Resolution.

3. The Oversight Agency's PM and Alternate PM shall have the authority lawfully vested in a Remedial Project Manager and On-Scene Coordinator ("OSC") by the NCP, 40 C.F.R. Part 300. The Oversight Agency's PM shall have authority, consistent with the National Contingency Plan, to halt any work required by this SOW, and to take any necessary Response Action.

7.2 Project and Site Manager

1. Within ten (10) days after the effective date of this SOW, the Site Operator shall designate a Project Manager and shall submit the name, address, and telephone number of the Project Manager to the Oversight Agency for review and approval. The Site Operator's Project Manager shall be responsible for overseeing the Site Operator's implementation of this SOW. If the Site Operator wishes to change the Project Manager, the Site Operator shall provide written notice to the Oversight Agency five (5) days prior to changing the Project Manager of the name and qualifications of the new Project Manager. The Site Operator's selection of a Project Manager shall be subject to the Oversight Agency approval, not to be unreasonably withheld. The Site Operator may seek Dispute Resolution with regard to the Oversight Agency's disapproval of selection of or change in a Project Manager.

2. All aspects of the Work to be performed by the Site Operator pursuant to this SOW shall be under the direction and supervision of a qualified Site Manager. The Site Manager shall be qualified on the basis of education and experience applicable to

implementing projects similar in scope to this SOW. The selection of the Site Manager shall be subject to approval by the Oversight Agency, not to be unreasonably withheld. Within fifteen (15) days after the Effective Date of this SOW, the Site Operator shall notify the Oversight Agency in writing of the name and qualifications of the Site Manager, including primary support entities and staff, proposed to be used in carrying out Work under this SOW. If at any time the Site Operator proposes to use a different Site Manager, the Site Operator shall notify the Oversight Agency and shall obtain approval, not to be unreasonably withheld, from the Oversight Agency before the new Site Manager performs any Work under the Consent Decree and this SOW.

3. The Oversight Agency will review the Site Operator's selection of a Site Manager. If the Oversight Agency disapproves of the selection of the Site Manager, the Site Operator shall submit to the Oversight Agency, within thirty (30) days after receipt of the Oversight Agency's disapproval of the Site Manager previously selected, a list of Site Managers, including primary support entities and staff, that would be acceptable to the Site Operator. The Oversight Agency will thereafter provide written notice to the Site Operator of the names of the Site Managers that are acceptable to the Oversight Agency. The Site Operator may then select any approved Site Manager from that list and shall notify the Oversight Agency of the name of the Site Manager selected within twenty-one (21) days of the Oversight Agency's designation of approved Site Managers. The Oversight Agency will not unreasonably withhold approval of a proposed new Site Manager.

7.3 Site Access and Data/Document Availability/ Institutional Controls

1. The Site Operator shall provide the Oversight Agency, the Support Agency, and their representatives with access at all reasonable times to the Site, or such other property, to conduct any activity related to this SOW, including but not limited to, the following activities:

   a. Monitoring the Work;

   b. Verifying any data or information submitted to the Oversight Agency or the Support Agency;

   c. Conducting investigations relating to contamination at or near the Site;

   d. Obtaining samples;

   e. Assessing the need for, planning, or implementing additional response actions at or near the Site;

   f. Implementing response activities at the Site;

   g. Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by the Site Operator or its agents, consistent with Section 7.4, *Access to Information*;

   h. Assessing the Site Operator's compliance with the Consent Decree and SOW;

i. Determining whether the Site or other property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted, by or pursuant to this SOW;

j. Conducting tests as the Oversight Agency or its authorized representatives or contractors deem necessary; and

k. Using a camera, sound recording device, or any other documentary type equipment.

2. Commencing on the date of the Consent Decree, the Site Operator shall refrain from using the Site, or such other property, in any manner that would interfere with or adversely affect the integrity or protectiveness of the remedial measures to be implemented pursuant to the Consent Decree and SOW.

3. If the Site Operator acquires any ownership or other property interest in the Site, or any other property where access and/or land/water use restrictions are needed to implement the Consent Decree, the Site Operator shall:

a. Upon acquiring such interest, provide the Oversight Agency, the Support Agency and their authorized representatives with access at all reasonable times to the Site, or such other property, for the purpose of conducting any activity related to this SOW and the Consent Decree including, but not limited to, the activities listed in Section 7.3(1); and

b. In coordination with the Oversight Agency and the Support Agency, take appropriate steps to ensure the long-term enforceability of access and institutional controls with respect to such property, including, but not limited to, appropriate deed notices and other actions.

4. The Oversight Agency will secure permission for the Site Operator to enter and perform Work at the property owned by Iron Mountain Mines, Inc., T.W. Arman (or subsequent owners), the United States, or the State (if any), including the facilities, plant and equipment located thereon (and necessary to carry out the actions of this SOW and Consent Decree) for the sole purpose of permitting the Site Operator to carry out the Work under this SOW and Consent Decree.

5. To the extent that access and/or land/water use restrictions at property not owned by the Site Operator and not at the property referenced in Section 7.3(4) are needed to implement the Consent Decree or this SOW, the Site Operator shall use its best efforts to secure from persons who own such property, to the extent determined by the Oversight Agency to be necessary, as applicable:

a. An agreement to provide access thereto for the Site Operator, as well as for the United States and the State, and their representatives (including contractors), for the purpose of conducting any activity related to the Consent Decree including, but not limited to, those activities listed in Section 7.3(1) of this SOW;

b. An agreement, enforceable by the Site Operator, the United States, and the State to abide by the obligations and restrictions established by Section 7.3(2) of this SOW, or that are otherwise necessary to implement, ensure non-interference with, or

ensure the protectiveness of the activities to be performed pursuant to the Consent Decree;

c. The execution and recordation in the Recorder's Office of Shasta County, California, of an easement, running with the land, that (i) grants a right of access for the purpose of conducting any activity related to this SOW and the Consent Decree including, but not limited to, those activities listed in Section 7.3(1) of this SOW, and (ii) grants the right to enforce the land/water use restrictions that the Oversight Agency and the Support Agency, as appropriate, determine are necessary to implement, ensure non-interference with, or ensure the protectiveness of the activities to be performed pursuant to the Consent Decree or this SOW;

d. The access rights and/or rights to enforce land/water use restrictions shall be granted to (i) the United States, on behalf of its representatives, (ii) the State and its representatives, and (iii) other appropriate grantees, as determined by the Oversight Agency; and

e. If the Oversight Agency so requests, within sixty (60) days of notice from the Oversight Agency that access is required, the Site Operator shall submit to the Oversight Agency and the Support Agency, as appropriate, for review and approval with respect to such property:

   i. A draft easement that is enforceable under the laws of the State of California, free and clear of all prior liens and encumbrances (except as approved by the Oversight Agency), and acceptable under the Attorney General's Title Regulations promulgated pursuant to 40 U.S.C. Section 255; and

   ii. A current title commitment or report prepared in accordance with the U.S. Department of Justice Standards for the Preparation of Title Evidence in Land Acquisitions by the United States (1970) (the "Standards"). Within fifteen (15) days of approval by the Oversight Agency and the Support Agency, as appropriate, and acceptance of the easement, the Site Operator shall update the title search and, if it is determined that nothing has occurred since the effective date of the commitment or report to affect the title adversely, the easement shall be recorded with the Recorder's Office of Shasta County. Within thirty (30) days of the recording of the easement, the Site Operator shall provide the Oversight Agency and the Support Agency, as appropriate, with final title evidence acceptable under the Standards and a certified copy of the original recorded easement showing the clerk's recording stamps.

6. If any access or land/water use restriction agreements required by Section 7.3(5) of this SOW are not obtained within the time specified in this SOW, or any access easements or restrictive easements required by this SOW are not submitted to the Oversight Agency in draft form within the time specified in this SOW, the Site Operator shall promptly notify the Oversight Agency and Support Agency in writing and shall include in that notification a summary of the steps that the Site Operator has taken to attempt to comply with Section 7.3(5) of this SOW. The United States and the State, as they deem appropriate, may assist the Site Operator in obtaining access or land/water use

restrictions, either in the form of contractual agreements or in the form of easements running with the land, or by utilizing appropriate enforcement mechanisms.

7. For purposes of Section 7.3(5) of this SOW only, "best efforts" includes the payment of reasonable sums of money in consideration of access, access easements, land/water use restrictions, and/or restrictive easements.

8. Notwithstanding any provision of this SOW, the United States and the State retain all of their access authorities and rights, as well as all of their rights to require land/water use restrictions, including enforcement authorities related thereto, under CERCLA, RCRA, and any other applicable federal or State law, statutes, or regulations.

9. During any future field work conducted by the Oversight Agency or its representatives to perform Remedial Investigations, Remedial Designs, Remedial Actions, or other projects, the Site Operator shall cooperate with the Oversight Agency to coordinate Site operations and to facilitate the activities to be performed by the Oversight Agency or its representatives. To the extent that the Oversight Agency activities require the use of water supplies from the existing water tanks (near the treatment plant and near the Richmond Portal) or other water sources, the Site Operator shall maintain the clean water delivery systems at no charge to the Oversight Agency, provided that the use of the clean water systems does not impose an undue impact to those systems. The Oversight Agency shall have the right to make use of the Site roadways and shall repair the roadways if damaged by the Oversight Agency activities. If electrical power is required during the performance of the Oversight Agency activities, the Oversight Agency shall have the right to use the electrical systems and compensate the Site Operator only for the power consumption costs for the Oversight Agency activities.

7.4 Access to Information

1. The Site Operator shall provide to the Oversight Agency and the Support Agency, upon request, copies of all documents and information within its possession or control or that of its contractors or agents relating to activities at the Site or to the implementation of the Consent Decree or this SOW, including, but not limited to, sampling, analysis, chain-of-custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, all operations and operators' logs, or other documents or information related to the activities required under the Consent Decree and SOW or previously conducted at the Site. The Site Operator shall also make available to the Oversight Agency and the Support Agency, their employees, agents, or representatives, knowledge of relevant facts concerning the performance of the activities required by the Consent Decree and SOW for purposes of investigation or information gathering.

2. The Site Operator may assert business confidentiality claims covering part or all of the documents or information submitted to the Oversight Agency and the Support Agency under this SOW or the Consent Decree to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Documents or information determined to be confidential by the Oversight Agency will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to the Oversight Agency and the Support Agency, or if the Oversight Agency has notified the Site Operator that the documents or information are not confidential under the stan-

dards of Section 104(e)(7) of CERCLA, the public may be given access to such documents or information without further notice to the Site Operator.

3. The Site Operator may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Site Operator asserts such a privilege in lieu of providing documents, the Site Operator shall provide the following: (a) the title of the document, record, or information; (b) the date of the document, record, or information; (c) the name and title of the author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the contents of the document, record, or information: and (f) the privilege asserted by the Site Operator. However, no documents, reports, or other information that are created or generated pursuant to the specific requirements of the Consent Decree and SOW shall be withheld on the grounds that they are privileged.

4. No claim of confidentiality shall be made with respect to any data, including but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, cost data relating to the Work excepting cost data related to wages, overhead rates, and profit, or any other documents or information evidencing conditions at or around the Site.

7.5 Record Preservation

1. Until 10 years after receipt of the Oversight Agency's notification pursuant to Section 7.14, *Completion of Work*, the Site Operator shall preserve and retain all records and documents now in its possession or control or that come into its possession or control that relate in any manner to the performance of activities at the Site, regardless of any corporate retention policy to the contrary. The Site Operator shall also instruct its subcontractors and agents to preserve all documents, records, and information of whatever kind, nature, or description relating to the performance of activities at the Site for a period of 10 years after the contractor or subcontractor has completed Work under this SOW. Notwithstanding the requirements of this Section, the Oversight Agency may, at its discretion, agree to shorten the records retention period or otherwise limit the obligations of this Section.

2. At the conclusion of the applicable document retention periods specified above, the Site Operator shall notify the Oversight Agency and the Support Agency at least ninety (90) days prior to the destruction of any such records or documents and, upon request by the Oversight Agency and the Support Agency, shall deliver any such records or documents to the Oversight Agency and the Support Agency. The Site Operator may assert that certain documents, records, and other information are privileged under the attorney-client privilege or any other privilege recognized by federal law. If the Site Operator asserts such a privilege, it shall provide the following: (a) the title of the document, record, or information; (b) the date of the document, record, or information; (c) the name and title of the author of the document, record, or information; (d) the name and title of each addressee and recipient; (e) a description of the subject of the document, record, or information; and (f) the privilege asserted by the Site Operator. However, no documents, reports or other information that are created or generated pursuant to the

specific requirements of the Consent Decree and SOW shall be withheld on the grounds that they are privileged.

7.6 Public Information and Meetings

1. The Site Operator shall cooperate with the Oversight Agency in providing information regarding the Work to the public.

2. As requested by the Oversight Agency, the Site Operator shall participate in the preparation of such information for distribution to the public and in public meetings that may be held or sponsored by the Oversight Agency to explain activities at or relating to the Site.

7.7 Remedy Review and Future Remedial Action

1. The Site Operator shall provide the Oversight Agency with any information available to the Site Operator that may assist the Oversight Agency in conducting any studies and investigations that may be appropriate to permit the Oversight Agency to conduct reviews of whether the remedial actions set forth in RODs 1 through 4 are protective of human health and the environment, at least every 5 years as required by Section 121(c) of CERCLA and any applicable regulations; provided, however, that the Site Operator shall not be required to expend more than $5,000 (adjusted for the Inflation Escalator) per each 5-year review period assisting in any one EPA review.

2. The Oversight Agency may select further response actions for the Site in accordance with the requirements of CERCLA and the NCP. Unless otherwise agreed by the Oversight Agency and the Site Operator, further response actions, including any further response actions implemented through future records of decision (such as decisions that address the Boulder Creek area sources and downstream sediments), or a modification, amendment or explanation of significant differences (ESD) of the RODs, neither diminish nor increase the scope of the Site Operator's obligations under this SOW.

7.8 Primary Oversight Agency

1. The Work is subject to oversight by the Oversight Agency. The Oversight Agency is the only state or federal agency authorized to direct the Site Operator with regard to the Site Operator's obligations under this SOW and the Consent Decree. The Oversight Agency is the agency authorized to give directions with regard to the Site Operator's obligations under this SOW and the Consent Decree on behalf of all participating government agencies. At the time the parties sign the Consent Decree, the Oversight Agency shall be the EPA. At some time in the future, the State and federal governments may change the Oversight Agency to a State or federal agency other than EPA. The relationship between the Oversight Agency and the Support Agency with respect to this SOW and Consent Decree are governed by the EPA/State MOU. A change in Oversight or Support Agency is not subject to Dispute Resolution by the Site Operator.

2. The governments will provide reasonable notice to the Site Operator if the governments change the Oversight Agency.

7.9 Support Agency Participation

1. The State of California, on behalf of DTSC and RWQCB, shall designate one of these two agencies to be the Support Agency for the Site during the period of time that EPA serves as the Oversight Agency. The State will provide notice to the Oversight Agency and the Site Operator of which State agency shall be the Support Agency. The State may change the Support Agency. A change in the Support Agency is not subject to Dispute Resolution by the Site Operator.

2. The governments will provide reasonable notice to the Site Operator if the governments change the Support Agency.

3. The Site Operator shall submit copies of documents submitted for Oversight Agency review pursuant to Section 6, *Management Plans and Reports*, and other documents requested, to the Support Agency at the same time the documents are submitted to the Oversight Agency.

4. The Support Agency shall have the right to participate in all meetings and inspections required by this SOW.

5. The Support Agency shall have a Support Agency Project Manager. The Support Agency will provide to the Oversight Agency and the Site Operator the name and address of the Support Agency Project Manager.

6. The relationship between the Oversight Agency and the Support Agency is addressed in the EPA/State MOU.

7.10 Compliance with Applicable Laws

1. All activities by the Site Operator pursuant to this SOW shall be performed in accordance with the requirements of all federal and state laws and regulations. EPA has determined that the activities contemplated by this SOW are consistent with the NCP.

2. As provided in Section 121(e) of CERCLA and Section 300.400(e) of the NCP, no permit shall be required for any response actions conducted entirely onsite (i.e., within the areal extent of contamination and all suitable areas in very close proximity to the contamination and necessary for implementation of such response actions) where such action is selected and carried out in accordance with Section 121. Where any activity that is not onsite (as defined in this SOW) requires a federal or state permit or approval, the Site Operator shall submit timely and complete applications and take all other actions necessary to obtain all such permits or approvals.

3. This SOW is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

4. The requirement of the Site Operator to perform all activities in this SOW in accordance with the requirements of all federal and state laws and regulations, as stated in Section 7.10(1) above, is subject to the provisions of Section 7.7(2) (relating to future remedial action) and Section 8.1(2) (relating to compensation associated with changes in Performance Standards imposed by the Oversight Agency).

7.11 Oversight Agency Approval of Plans and Submissions

1. In reviewing any plan, report, or other item which is required to be submitted for approval pursuant to this SOW or the Consent Decree, the Oversight Agency will consider whether the submittal will achieve the Performance Standards and other requirements of this SOW in a highly reliable manner based on sound technical and/or engineering practices.

2. After review of any plan, report, or other item which is required to be submitted for approval pursuant to this SOW and Consent Decree, the Oversight Agency, after reasonable opportunity for review and comment by the Support Agency, shall:

   a. Approve, in whole or in part, the submission;

   b. Approve the submission upon specified conditions;

   c. Modify the submission to cure the deficiencies;

   d. Disapprove, in whole or in part, the submission, directing that the Site Operator modify the submission; or

   e. Any combination of the above.

   However, the Oversight Agency shall not modify a submission without first providing the Site Operator at least one notice of deficiency and an opportunity to cure within sixty (60) days, except where to do so would cause serious disruption to the activities being undertaken pursuant to the Consent Decree and SOW or where previous submission(s) have been disapproved due to material defects and the deficiencies in the submission under consideration indicate a bad faith lack of effort to submit an acceptable deliverable.

3. In the event of approval, approval upon conditions, or modification by the Oversight Agency, pursuant to Section 7.11(2)(a, b, or c), the Site Operator shall proceed to take any action required by the plan, report, or other item, as approved or modified by the Oversight Agency, subject only to its right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) of the Consent Decree with respect to the modifications or conditions made by the Oversight Agency and subject to Section 7.12 regarding the performance of disputed Work. In the event that the Oversight Agency modifies the submission to cure the deficiencies pursuant to Section 7.11(2)(c) and the submission has a material defect, the Oversight Agency retains its right to seek stipulated penalties, as provided in Section XX (Stipulated Penalties) of the Consent Decree.

4. Upon receipt of notice of disapproval pursuant to Section 7.11(2)(d), the Site Operator shall, within thirty (30) days or such longer time as specified by the Oversight Agency in such notice, correct the deficiencies and resubmit the plan, report, or other item for approval. Stipulated penalties applicable to the submission, as provided in Section XX of the Consent Decree, shall accrue during the 30-day period or otherwise specified period, but shall not be payable unless the resubmission is disapproved or modified due to a material defect as provided in Section 7.11(2) or Section 7.11(7).

5. Notwithstanding the receipt of a notice of disapproval pursuant to Section 7.11(2)(d), the Site Operator shall proceed, at the direction of the Oversight Agency, to take any action

required by any non-deficient portion of the submission. Implementation of any non-deficient portion of a submission shall not relieve the Site Operator of any liability for stipulated penalties under Section XX (Stipulated Penalties) of the Consent Decree.

6. In the event that a resubmitted plan, report, or other item, or portion thereof, is disapproved by the Oversight Agency, the Oversight Agency may again require the Site Operator to correct the deficiencies, in accordance with the preceding paragraphs. The Oversight Agency also retains the right to modify or develop the plan, report or other item. The Site Operator may invoke the procedures set forth in Section XIX (Dispute Resolution) of the Consent Decree to dispute a disapproval or modification under this Paragraph. The Site Operator shall implement any such plan, report, or item as modified or developed by the Oversight Agency except to the extent that the Site Operator invokes the procedures set forth in Section XIX (Dispute Resolution) of the Consent Decree. If the Site Operator invokes the Dispute Resolution procedures, the performance of Work in dispute shall be governed by Section 7.12.

7. If upon resubmission, a plan, report, or item is disapproved or modified by the Oversight Agency due to a material defect, the Site Operator shall be deemed to have failed to submit such plan, report, or item timely and adequately unless the Site Operator invokes the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution), and the Oversight Agency's action is overturned pursuant to that Section. The provisions of Section XIX (Dispute Resolution) and Section XX (Stipulated Penalties) of the Consent Decree shall govern the implementation of all activities pursuant to the Consent Decree and the accrual and payment of any stipulated penalties during Dispute Resolution. If the Oversight Agency's disapproval or modification is upheld, stipulated penalties shall accrue for such violation from the date on which the initial submission was originally required, as provided in Section XX of the Consent Decree.

8. All plans, reports, and other items required to be submitted to the Oversight Agency under this SOW and the Consent Decree shall, upon approval or modification by the Oversight Agency, be enforceable under this SOW or the Consent Decree. In the event the Oversight Agency approves or modifies a portion of a plan, report, or other item required to be submitted to the Oversight Agency under this SOW or the Consent Decree, and the modification is upheld through Dispute Resolution (if applicable), the approved or modified portion shall be enforceable under this SOW or the Consent Decree.

9. In connection with agency oversight of the Work, the Site Operator shall participate in conference calls and meetings, as necessary.

10. Nothing contained in the Consent Decree or this SOW shall confer any benefit or right to any person or entity not a signatory to the Consent Decree, nor shall any such person or entity have any right to enforce the Consent Decree, this SOW, or any of the provisions of either of them. However, any federal or State agency designated as the Oversight Agency or Support Agency shall have all of the rights of any predecessor Oversight Agency regardless of whether the Oversight Agency or Support Agency was a signatory to the Consent Decree.

7.12 Performance of Disputed Work

1. During the Dispute Resolution under Section XIX of the Consent Decree, the Oversight Agency may elect to order the Site Operator to perform the Work directly in dispute and the Site Operator shall comply with the order to perform such Work. The Oversight Agency may also order the Site Operator to provide a cost estimate of the Work directly in dispute (under the procedures of Section 4.2.2). The Oversight Agency will not order the Site Operator to perform such Work unless the Oversight Agency has sufficient funds in the Iron Mountain Mines special account or accounts or sources of funds established pursuant to the Consent Decree to pay for the disputed Work (taking into account any avoided costs or savings), and so notifies the Site Operator in advance by providing the most current accounting statement from the Iron Mountain Mines special account or other funding source. If the Oversight Agency directs the Site Operator to perform such Work, such Work shall be Added Scope Work for purposes of Section 4.2 if the Site Operator establishes through Dispute Resolution that such Work is beyond the scope of this SOW. If the Site Operator does not establish that the Work is beyond the scope of this SOW, the Site Operator shall be responsible for the costs and expenses of the disputed Work.

2. The invocation of Dispute Resolution does not relieve the Site Operator from meeting the Performance Standards or other requirements of this SOW.

7.13 Assurance of Ability to Complete Work

7.13.1 Purpose

1. The Site Operator shall provide the Oversight Agency with the assurance that it has adequate financial capabilities to complete the Work required by this SOW. At the start of the Performance Period, the Policy, in combination with the Site Operator's compliance with the other insurance requirements contained in this SOW, will provide financial assurance that exceeds the Site Operator's projected cost of the Work under this SOW. In the event that the expected project completion costs for Work under this SOW exceeds the applicable limits remaining in the Policy, the Site Operator shall post financial assurance using one or more of the methods outlined in Section 7.13.4 of this SOW to the extent required by this Section to ensure completion of the Work under this SOW.

7.13.2 Timing

1. At the end of the Site Operator's 10th fiscal year, and every 3 years thereafter, the Site Operator shall prepare and submit to the Oversight Agency for review and approval a financial report comparing the funds available in the Policy with the current estimated cost to complete the Work under this SOW. If the report indicates that financial assurance is required, then the Site Operator shall post the required financial assurance within ninety (90) days after the close of the Site Operator's fiscal year.

7.13.3 Method of Calculation for Presumed Current Completion Costs

1. This Section sets forth the method for calculating the expected project completion costs ("Current Project Completion Costs") and the amount of financial assurance required in the event that project completion costs exceed the remaining policy limits. The method

of calculating the Current Project Completion Costs is presumed to be sufficiently accurate, but the parties may use another, reasonable method of calculating the expected project completion costs if factors indicate that the presumed method of calculation significantly misstates the actual cost to complete. In that event, the Oversight Agency may approve use of another, reasonable method of calculating the expected cost of project completion.

2. Beginning with the fiscal year ended December 31, 2001, the Site Operator shall, on an annual basis, convert the total costs for each fiscal year back to Year 2000 dollars by discounting (using the increase in the CPI-U from December 2000) the actual costs and fees (including markups) incurred by the Site Operator in each fiscal year; provided, however, the Site Operator shall not be required to include any increase in the CPI-U for the fiscal year ending December 31, 2001. For example, if the total cost at Year 2 was $5 million and the CPI-U has increased by 5 percent since 2000, the figure for Year 2 is discounted back to Year 2000 dollars using the following formula: $5M/1.05. This figure shall be the "Real Dollar Cost" for that given year.

3. The Site Operator shall sum the Real Dollar Cost for each year and determine the average Real Dollar Cost by dividing the total sum by the number of years in the set. This average will be the "Real Dollar Average Cost."

4. The Site Operator shall convert the Real Dollar Average Cost to the then-current dollars by inflating the Real Dollar Average Cost to current dollars. This calculation is performed by multiplying the Real Dollar Average Cost by the percentage increase in the CPI-U since December 2000. This figure will be the "Current Dollar Average Cost." For example, if the Real Dollar Average Cost over the first 10 years is $5 million and the CPI-U has increased by 15 percent by Year 10, the Current Dollar Average Cost would be calculated as follows: $5M x 1.15.

5. The Site Operator shall assume that the Current Dollar Average Cost reflects the average future costs and that future inflation is 3.25 percent per year. The expected future project costs are calculated by taking the sum of the expected future costs by adjusting the Current Dollar Average Cost using a 3.25 percent inflation factor for each year remaining in the program. For example, if there were 3 years left in the program and the Current Dollar Average Cost were $10 million, the calculation would be as follows:

   $10M \times 1.0325 + 10M \times 1.0325^2 + 10M + 1.0325^3$.

6. The figure calculated in this manner shall be presumed to be the Current Cost of Completion unless there is strong evidence that the figure should be modified. Factors that may justify a modification to this calculation include:

   a. Whether the rainfall over the entire period has been significantly above or below the historic average rainfall;

   b. Whether there is a new technology that has demonstrated an expected significant cost savings or cost increase relative to the historic costs;

   c. Whether the Site conditions have changed in a significant manner that translates into demonstrated increased or decreased costs relative to the historic costs;

d. Whether an extremely low probability and very high cost event has occurred; and

e. Whether there are factors that have occurred since the project start that provide strong evidence that the cost of completion should be modified.

If such factors exist, the Current Cost of Completion may be modified as appropriate to reflect such factors.

7. If the Current Cost of Completion is equal to or less than the remaining applicable limits of the Policy, the Site Operator shall not be obligated to post financial assurance in addition to the Policy.

8. If the Current Cost of Completion is greater than the remaining applicable limits of the Policy, then the Site Operator shall post financial assurance in an amount equal to the difference between the Current Cost of Completion and the remaining limits of the Policy.

7.13.4 Form of Financial Assurance

1. If the Site Operator is required to post financial assurance under this Section, the Site Operator shall establish and maintain financial security in one or more of the following forms:

   a. A surety bond guaranteeing performance of the activities to be undertaken pursuant to the Consent Decree and this SOW;

   b. One or more irrevocable letters of credit equaling the total estimated cost of such activities;

   c. A trust fund;

   d. A guarantee to perform the activities required under the Consent Decree and this SOW by one or more parent corporations or subsidiaries, or by one or more unrelated corporations that have a substantial business relationship with the Site Operator;

   e. A demonstration that the Site Operator satisfies the requirements of 40 C.F.R. Part 264.143(f); or

   f. An appropriate insurance vehicle satisfactory to the Oversight Agency.

2. If the Site Operator seeks to demonstrate the ability to complete the activities required by the Consent Decree and this SOW through a guarantee by a third party pursuant to Section 7.13.4(1)(d), above, the Site Operator shall demonstrate that the guarantor satisfies the requirements of 40 C.F.R. Part 264.143(f). If the Site Operator seeks to demonstrate its ability to complete the activities required by the Consent Decree and this SOW by means of the financial test or the corporate guarantee pursuant to Section 7.13.4(1)(d) or, it shall resubmit sworn statements conveying the information required by 40 C.F.R. Part 264.143(f) annually, on the anniversary of the Effective Date of this SOW. In the event that the Oversight Agency, after a reasonable opportunity for review and comment by the Support Agency, determines at any time that the financial assurances provided pursuant to this Section are inadequate, the Site Operator shall, within thirty (30) days of receipt of notice of the Oversight Agency's determination, obtain and

present to the Oversight Agency for approval one of the other forms of financial assurance listed in Section 7.13.4(1), above. The Site Operator's inability to demonstrate financial ability to complete the activities required by the Consent Decree and this SOW shall not excuse performance of such activities.

3. The Site Operator may demonstrate that the financial security necessary for the remaining activities required by the Consent Decree and this SOW has diminished below the amount set forth in Section 7.13.3(8) above, on the 3-year anniversaries of the entry of the Consent Decree. The Site Operator may, on those anniversary dates, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. The Site Operator shall submit a proposal for such reduction to the Oversight Agency, in accordance with the requirements of this Section and may reduce the amount of the security upon approval by the Oversight Agency. In the event of a dispute, the Site Operator may reduce the amount of the security in accordance with the final administrative or judicial decision resolving the dispute.

4. The Site Operator may change the form of financial assurance provided under this Section 7.13.4 at any time, upon notice to and approval by the Oversight Agency, provided that the new form of assurance meets the requirements of this Section. In the event of a dispute, the Site Operator may change the form of the financial assurance only in accordance with the final administrative or judicial decision resolving the dispute.

7.14 Completion of Work

1. Within ninety (90) days prior to the termination of the Performance Period, the Site Operator shall schedule and conduct a pre-certification inspection to be attended by the Site Operator, Oversight Agency, and the Support Agency. After the pre-certification inspection, the Site Operator shall submit a written report to the Oversight Agency and the Support Agency stating that the activities required under this SOW and the Consent Decree have been completed in full satisfaction of the requirements of this SOW and the Consent Decree. The report shall contain the following statement, signed by a responsible corporate official of the Site Operator or by the Site Operator's Project Manager:

> To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

2. The Site Operator's obligation to perform Operation and Maintenance under this SOW shall terminate when the Performance Period ends. Notwithstanding the prior sentence, after review of the written report, if the Oversight Agency, after reasonable opportunity to review and comment by the Support Agency, determines that any portion of the activities required to be completed during the Performance Period by this SOW or the Consent Decree has not been completed in accordance with this SOW or the Consent Decree, the Oversight Agency will notify the Site Operator in writing of the activities that must be undertaken by the Site Operator pursuant to this SOW or the Consent Decree. Provided, however, that the Oversight Agency may only require the Site Operator to perform such activities pursuant to this Paragraph to the extent that such

activities were required to be performed prior to the end of the Performance Period and were specified as planned activities in the Final Annual Operations Work Plan (as defined in section 6.3), or to the extent such activities constitute necessary repairs to O&M Units or O&M Unit Components discovered after approval of the Final Annual Operations Work Plan and before the completion of the Performance Period; and further provided that such activities are not Routine O&M activities. The Oversight Agency will set forth in the notice a schedule for performance of such activities consistent with the O&M Plan, this SOW, and the Consent Decree or require the Site Operator to submit a schedule to the Oversight Agency for approval pursuant to Section 7.11, *Oversight Agency Approval of Plans and Other Submissions*. The Site Operator shall perform all activities described in the notice in accordance with the specifications and schedules established therein, subject to its right to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) of the Consent Decree.

3. If the Oversight Agency concludes, based on the initial or any subsequent request for Certification of Completion by the Site Operator and after a reasonable opportunity for review and comment by the Support Agency, that the activities required by this SOW and the Consent Decree have been performed in accordance with this SOW and the Consent Decree, the Oversight Agency will so notify the Site Operator in writing. The Oversight Agency may not unreasonably withhold approval of the Work.

7.15 Force Majeure

1. "Force Majeure," for purposes of the Consent Decree and this SOW, is defined as any event arising from causes beyond the control of the Site Operator, of any entity controlled by the Site Operator, or of the Site Operator's subcontractors, including lack of legal access to the property identified in Section 7.3(4), that delays or prevents the performance of any obligation under this SOW or the Consent Decree despite the Site Operator's best efforts to fulfill the obligation. The requirement that the Site Operator exercises "best efforts to fulfill the obligation" includes using best efforts to anticipate any potential Force Majeure event and best efforts to address the effects of any potential Force Majeure event (a) as it is occurring, and (b) following the potential Force Majeure event, such that the delay or prevention of performance is minimized to the greatest extent possible. "Force Majeure" does not include financial inability to complete the activities required by this SOW or the Consent Decree.

2. If any event occurs or has occurred that may delay or prevent the performance of any obligation under this SOW or the Consent Decree, whether or not caused by a Force Majeure event, the Site Operator shall notify orally the Oversight Agency's Project Coordinator or, in his or her absence, the Oversight Agency's Alternate Project Coordinator or, in the event both of the Oversight Agency's designated representatives are unavailable, the Director of the Superfund Division, EPA Region 9, as soon as possible under the circumstances. It shall be presumed that notice not made within four (4) Working Days of when the Site Operator knew or should have known that the event might cause a delay or non-performance is untimely unless evidence credible to the Oversight Agency and to the contrary is provided to the Oversight Agency by the Site Operator. Within ten (10) days thereafter or such longer time as specified by the Oversight Agency, the Site Operator shall provide in writing to the Oversight Agency and the Support Agency an explanation and description of the reasons for the delay or failure to

perform; the anticipated duration of the delay or failure to perform; all actions taken or to be taken to prevent or minimize the delay or failure to perform; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay or failure to perform; the Site Operator's rationale for attributing such delay or failure to perform to a Force Majeure event if it intends to assert such a claim; and a statement as to whether, in the opinion of the Site Operator, such event may cause or contribute to an endangerment to public health, welfare, or the environment. The Site Operator shall include with any notice all available documentation supporting its claim that the delay or failure to perform was attributable to a Force Majeure. Failure to substantially comply with the above requirements shall preclude the Site Operator from asserting any claim of Force Majeure for that event for the period of time of such failure to comply, and for any additional delay or failure to perform caused by such failure to comply. The Site Operator shall be deemed to know of any circumstance of which the Site Operator, any entity controlled by the Site Operator, or the Site Operator's subcontractors knew or should have known.

3. If the Oversight Agency, after a reasonable opportunity for review and comment by the Support Agency, agrees that the delay or anticipated delay or failure to perform is attributable to a Force Majeure event, (a) the time for performance of the obligations under this SOW or the Consent Decree that are affected by the Force Majeure event will be extended by the Oversight Agency, after a reasonable opportunity for review and comment by the Support Agency, for such time as is necessary to complete those obligations and (b) any non-compliance with Performance Standards or other requirements of this SOW directly caused by the Force Majeure event shall not be a violation of this SOW. An extension of the time for performance of the obligations affected by the Force Majeure event shall not, of itself, extend the time for performance of any other obligation not affected by the Force Majeure event. If the Oversight Agency, after a reasonable opportunity for review and comment by the Support Agency, does not agree that the delay, anticipated delay, or failure to perform has been or will be caused by a Force Majeure event, the Oversight Agency will notify the Site Operator in writing of its decision and the Site Operator may invoke Dispute Resolution under the Consent Decree. If the Oversight Agency, after a reasonable opportunity for review and comment by the Support Agency, agrees that the delay or failure to perform is attributable to a Force Majeure event, the Oversight Agency will notify the Site Operator in writing of the length of the extension, if any, for performance of the obligations affected by the Force Majeure event.

4. If the Site Operator elects to invoke the Dispute Resolution procedures set forth in Section XIX (Dispute Resolution) of the Consent Decree, it shall do so no later than fifteen (15) days after receipt of the Oversight Agency's notice. In any such proceeding, the Site Operator shall have the burden of demonstrating by a preponderance of evidence that the delay, anticipated delay, or failure to perform has been or will be caused by a Force Majeure event, that the duration of the delay, failure to perform, or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay or failure to perform, and that the Site Operator complied with the requirements of Paragraphs 1, 2, and 3 of this Section 7.15. If the Site Operator carries this burden, the delay or failure to perform at

issue shall be deemed not to be a breach by the Site Operator of the affected obligation of this SOW or the Consent Decree identified to the Oversight Agency and the Court.

7.16 Work Takeover

1. If the Oversight Agency determines that the Site Operator has ceased implementation of any portion of the activities required by the Consent Decree and this SOW, is seriously or repeatedly deficient or late in its performance of any such activities, or is implementing any such activities in a manner that presents an imminent and substantial endangerment to human health or the environment, or has improperly transferred responsibility without approval under Section III of the Consent Decree, the Oversight Agency may assume the performance of all or any portions of such activities as the Oversight Agency determines necessary. Before assuming performance of the Work, the Oversight Agency shall first give the Site Operator notice of its intent to do so and, unless there is insufficient time to do so or the condition is one that cannot be cured, shall provide the Site Operator with a reasonable period of time to cure the alleged problems with the Work. The Site Operator may invoke the procedures set forth in Section XIX of the Consent Decree (Dispute Resolution) to dispute the Oversight Agency's determination that takeover of any activity required under the Consent Decree and this SOW is warranted under this Section or the amount of any payment due the Oversight Agency under this Section.

2. The Site Operator's obligations in the event of a Work Takeover are:

   a. To continue performance of all obligations under this SOW other than related solely to the specific Work being taken over by the Oversight Agency;

   b. To cooperate fully with the Oversight Agency and assist the transition from the Site Operator of the Work being assumed by the Oversight Agency;

   c. To provide the Oversight Agency, or its designee, with all tools, equipment, vehicles, materials, supplies, software, documents, files, or other equipment or materials being used by the Site Operator to perform the Work being assumed by the Oversight Agency. The Oversight Agency shall exclude from its Response Costs any charge for fair market/rental value for such items provided by the Site Operator except to the extent a third party charges the Oversight Agency for such costs. Use of such items by the Oversight Agency shall not give rise to a charge, set-off or similar right by the Site Operator;

   d. To provide the Oversight Agency, or its designee, with all historic records, documents, or other materials that document the conditions at the Site or the Work performed by the Site Operator prior to the Work Takeover;

   e. To provide the Oversight Agency with access to the Site Operator's key employees who have operational knowledge of the Work being assumed by the Oversight Agency; and

   f. To help the Oversight Agency obtain, if requested by the Oversight Agency, enforceable rights to continue, any contracts, subcontracts, supply contracts, licenses, or other intangible assets being used by the Site Operator to perform the Work being assumed by the Oversight Agency.

3. If the Oversight Agency takes over performance of some or all of the activities required under the Consent Decree and this SOW, the Site Operator shall pay the Oversight Agency's Response Costs in the manner provided by Section XVI of the Consent Decree, except to the extent that such costs are paid to the Oversight Agency by the Policy. To the extent required by the NCP, the Oversight Agency shall use reasonable efforts to mitigate its Response Costs in the event of a full or partial Work Takeover. At the discretion of the Oversight Agency, the Oversight Agency may take over the Work itself, or the Site Operator may be replaced by a third party. A Work Takeover does not relieve the Site Operator from obligations relating to financial assurance, payment of Response Costs, or document retention. In the event that a Work Takeover by the Oversight Agency is found through Dispute Resolution to not be authorized under this SOW, the Site Operator shall be reinstated with respect to such Work, and the Site Operator shall not be deemed to have waived any rights for damages that it may have for the period that Work was taken over. Costs incurred by the Oversight Agency pursuant to Section 7.16 shall be considered Response Costs that the Site Operator shall pay pursuant to Section XVI of the Consent Decree (Reimbursement of Response Costs).

4. The remedies provided in this Section are in addition to, and not exclusive of, any other remedies provided by this SOW or Consent Decree.

7.17 Post-Performance Period Transition

1. At the end of the Performance Period, or such other time that the Site Operator's Work obligations under this SOW are terminated, the Site Operator shall transfer, or cause the Trust to transfer, to the entity as directed by the Oversight Agency, whatever right, title and interest in or to the Site, any O&M Unit, and any O&M Unit Component which the Site Operator and Trust may have. The Site Operator may retain any vehicles, trucks, expensed equipment, office supplies, and other personal property owned by the Site Operator, and the Site Operator will remove such property from the Site within a reasonable period after the Performance Period.

2. At the conclusion of the Performance Period, the Site Operator will assist the Oversight Agency in the orderly transition of responsibility for Site activities from the Site Operator to the Oversight Agency or other entity as directed by the Oversight Agency.

8. Performance Standards

8.1 Introduction

1. The Site Operator shall diligently operate and maintain the O&M units to protect facilities and personnel, both onsite and offsite, from damage, injury, or illness that could result from fire, accidental chemical releases, unsafe conditions, flooding, erosion, and all other reasonably anticipated sources, conditions, and events. The criteria used to design the O&M Units to achieve the Performance Standards for the IMM Remedy are further described in applicable Design Criteria Reports, Engineering Analysis Reports, designs, and other design documents produced during the design of the facilities to implement the IMM Remedy. To the extent practicable, the Site Operator shall reconstruct or repair components of the O&M Units in conformance with the available design documents for the IMM Remedy listed in Attachment D to this SOW. To the extent such

documents are not available or to the extent the Site Operator can establish an alternative approach meets the objectives of this SOW, the Site Operator shall reconstruct or repair the components in a manner that achieves the Performance Standards and other requirements of this SOW in a reliable manner.

2. The Performance Standards stated in Sections 8 and 14 shall be the applicable Performance Standards during the Performance Period. The Oversight Agency may impose more stringent Performance Standards or add new Performance Standards, provided that the Site Operator is compensated for its additional costs, if any, as provided in Section 4 and is given a reasonable period of time to achieve the modified or new Performance Standards. Actions required to meet the Performance Standards or other requirements of this SOW shall not be a modification of Performance Standards for purposes of this Paragraph.

3. At any time during the Performance Period, the Site Operator may petition the Oversight Agency to modify the Performance Standards provided herein. The Site Operator shall describe in detail its basis for modification and attach all supporting data. A decision of the Oversight Agency regarding modification under this Section 8.1.3 of Performance Standards shall not be subject to Dispute Resolution or judicial review by the Site Operator.

4. Notwithstanding anything herein to the contrary, neither this SOW nor the Site Operator's Work Plans or other documents submitted pursuant to this SOW, nor the undertaking of any Work herein, shall constitute a warranty, express or implied, as to Site Operator's ability to meet the Performance Standards.

5. This SOW and the Consent Decree do not obligate the Site Operator to perform, without additional compensation, any Work that is beyond the scope of this SOW.

8.2 General Performance Standards

1. The Site Operator is responsible for achieving the Performance Standards and other requirements of this SOW despite any unknown or unanticipated conditions, unusual weather or severe conditions, except to the limited extent specifically allowed by this SOW.

2. The Site Operator shall:

   a. Comply with all requirements set forth in the Consent Decree.

   b. Ensure effective and reliable operation of the IMM Remedy.

   c. Ensure the collection, conveyance, and treatment of all Designated Contaminant Discharges except to the extent specifically allowed by this SOW in Sections 8.4 or 7.15 or to the extent specifically allowed in subsequent amendments to this SOW and/or Consent Decree.

   d. Ensure achievement of the Performance Standards set forth in Sections 8 and 14 of this SOW.

   e. Plan and execute the Work under this SOW in a manner that provides safe working conditions and ensures protection of worker health and safety under all anticipated

conditions. The Site Operator shall use best efforts to anticipate and avoid situations that pose an unacceptable risk to worker health and safety. If a situation arises where performing a task poses an unacceptable risk to worker health and safety, the Site Operator may reschedule the Work element until the soonest next available time when the Work can be safely performed in accordance with this SOW and requirements of the Health and Safety Plan for the Site. In such situations, the Site Operator shall take all necessary actions to mitigate and minimize any non-compliance with the Performance Standards and other requirements of this SOW. If a situation giving rise to the unacceptable health and safety risk arose despite the best efforts of the Site Operator to anticipate and prepare for the situation, and the Site Operator took appropriate mitigation steps during the delay, the Site Operator shall not be considered to be in breach of this SOW or the Consent Decree for the delay in performing the required task. The Site Operator shall report to the Oversight Agency and Support Agency such situations within twelve (12) hours of discovery of the situation and in the Monthly Progress Reports.

f. The Site Operator shall maintain and replace, as appropriate, all O&M Units and O&M Unit Components so that, during the performance of this SOW and at the completion of the Site Operator's obligations under this SOW, the O&M Units, and all O&M Unit Components:

   i. Are reliable and fully functional; and

   ii. Meet or exceed the applicable Transition Condition (as defined in paragraph 3 of this section below) described in the Final Asset Management Plan (as defined in paragraph 3 of this section below);

3. By May 1, 2014, the Site Operator shall submit for the Oversight Agency's review and approval an asset management plan that is consistent with *Asset Management: A Best Practices Guide* (EPA 816-4-08-014, March 2008), to the extent such guidance is applicable to the types of O&M Units and O&M Components operated by the Site Operator. The Site Operator shall submit for the Oversight Agency's review and approval an updated asset management plan by May 1, 2019, and another by May 1, 2024. The updated asset management plan submitted by May 1, 2024 (the "Final Asset Management Plan") shall include a description, for each O&M Unit and O&M Unit Component, of the operating condition ("Transition Condition") that the unit or component must meet or exceed at the end of the Performance Period to ensure that it is reliable and fully functional and has a reasonable remaining useful life.

8.3 Good Housekeeping Standards

1. The Site Operator shall diligently perform good housekeeping with respect to the O&M Units to ensure effective implementation of the IMM Remedy.

2. The Site Operator shall maintain equipment in a manner that ensures a clean, well-kept appearance.

3. The Site Operator shall maintain the O&M Units and all areas within 30 feet of O&M Units clear of dead and downed brush, trees, and debris. The Site Operator shall

properly dispose of removed and cleared brush and trees, such as through chipping or burning at an approved burn location.

4. The Site Operator shall maintain all areas within 30 feet of all power poles clear of dead and downed brush, trees, and debris. The Site Operator shall properly dispose of removed and cleared brush and trees, such as through chipping or burning at an approved burn location.

5. The Site Operator shall use reasonable efforts to prevent unauthorized entry to the Site.

6. The Site Operator shall provide a safe working environment through keeping Work areas free of tripping and other hazards, providing lighting for any night work, and implementing an adequate safety program.

8.4 Minnesota Flats Treatment Plant

1. The Site Operator shall achieve the Performance Standards in this SOW as set forth in Sections 8 and 14.

2. The Site Operator shall operate and maintain the HDS plant in a manner that optimizes (maximizes) terminal sludge density while maximizing long-term performance and reliability of the treatment plant equipment. Terminal sludge density is the density of the sludge prior to sludge haulage.

3. The Site Operator shall operate and maintain the reactor blowers and aeration systems in a manner that maximizes oxidation of the sludge prior to discharge of the sludge to the sludge drying beds. The Site Operator shall, to the maximum extent practicable, produce a fully oxidized sludge characterized by a deep red color (Munsell Soil Color Chart 10R 3/6 Dark Red).

4. The Site Operator shall provide staff trained for operations, maintenance, and safety in accordance with the requirements specified in the *Operations and Maintenance Instructions, High Density Sludge Treatment Plant, Iron Mountain Mine-Redding, CA,* included by reference as Attachment E. The Site Operator shall maintain records onsite that verify the training for all treatment plant staff.

5. The Site Operator shall maintain the maximum design peak inflow capacity at 6,500 gpm. The Site Operator shall operate the MFTP with a target inflow rate of 5,500 gpm to ensure 1,000 gpm emergency capacity to address AMD surges and other unusual conditions. The Site Operator shall follow the operational requirements as stated in the *Draft Operations and Maintenance Manual, Slickrock Creek Retention Reservoir Project.*

6. The Site Operator shall maximize the use of emergency storage to prevent discharge of untreated or partially treated Designated Contaminant Discharges. In the event that the influent flow rate to the MFTP exceeds the capacity of the MFTP to neutralize the influent, and all available storage, the Site Operator shall maximize removal of metals by providing treatment of Designated Contaminant Discharges according to the following priorities: (a) Richmond portal, (b) Lawson portal, (c) Old No. 8 Mine Seep, and (d) SCRR.

7. In situations where the Designated Contaminant Discharges exceed the capacity of the MFTP, the Site Operator shall notify the Oversight Agency within eight (8) hours, shall

use best efforts to avoid the release of untreated AMD, and shall coordinate with the Oversight Agency to modify the operations approach to address the problem. The Site Operator shall take immediate actions to prevent or minimize the release of untreated or partially treated AMD, including, but not limited to, coordinating the operation of the SCRR, using the Old/No. 8 Mine as a storage facility, filling the AMD storage tank, and filling the Modutank. If despite these efforts, there is insufficient storage and treatment capacity, the Site Operator shall maximize removal of metals by prioritizing the treatment of flows according to Section 8.4(6). If there is a release of untreated or partially treated Designated Contaminant Discharges, then the Site Operator shall not be responsible for the release of Designated Contaminant Discharges due to an exceedance of the capacity of the MFTP, to the extent that such discharges exceed the capacity of the MFTP, provided that the Site Operator follows these procedures and has maintained the capacity of the MFTP and other relevant facilities as required by this SOW.

8.5 Treatment Plant Ancillary Facilities

8.5.1 Plant Roads

1. The Site Operator shall maintain the roadbase-surfaced roads in a manner that preserves or improves the existing (August 1, 2000) condition and road surface quality, provides safe access, preserves the initial investment of the roadway construction, and provides reasonable ride quality. The Site Operator shall maintain all roadways within and adjacent to the treatment plant and sludge drying beds. This maintenance shall include routine regular removal of sediment from ditches and culverts prior to and during winter months, routine road grading and patching, filling potholes, and resurfacing of roads surfaced with roadbase to minimize rut formation in conformance with the original design.

2. The Site Operator shall maintain the asphalt-paved road in a manner that preserves the existing (August 1, 2000) road surface, provides safe access, preserves the initial investment of the roadway construction, and provides reasonable ride quality. Asphalt roadway deficiencies vary considerably. Conditions to be prevented and corrected include, but are not limited to, chronically slippery pavement, raveling, rutting, potholes, abrupt vertical variations, pavement cracks, and shoulder distress. Depending on the extent and severity of the observed distress, the Site Operator shall implement corrective measures, including roadbase repair, hand patching, machine patching, spot sealing, seal coat, crack sealing and/or filling, cold planing, and overlays.

3. Inspections of the asphalt-paved roads shall be conducted as needed, but at a minimum the inspections shall be performed annually to identify pavement deficiencies requiring corrective measures. Upon identification of a deficiency, permanent corrective measures shall be scheduled to occur on an annual basis. If unsafe conditions exist when permanent repair operations are not scheduled, temporary measures may be utilized to bring the pavement into a safe condition. These temporary measures shall be replaced with a permanent corrective measure during the next regular repair operation.

4. The Site Operator shall maintain asphalt-paved roads at the Site in a manner that complies with the Shasta County Development Standards.

8.5.2 Hillslopes

1. The Site Operator shall maintain hillslopes above and below the emergency storage tank, sludge drying beds, and the treatment plant in a manner that directs drainage to the existing drainage ditches, and prevents gullying, concentrated flow patterns, and erosion of the slope surfaces. The Site Operator shall repair or improve surface erosional features annually, or more often as required, to prevent development of gullies and sedimentation of receiving drainage ditches. The repairs shall include placement or replacement of erosion mats, geotextiles, and riprap covers, or other designs.

8.5.3 Effluent Discharge Works

1. The Site Operator shall operate and maintain the effluent discharge works, including the intake, piping, outlet works, and dike separating the outlet works from Spring Creek, in a manner that ensures continuous 10,000 gpm discharge capacity of the outlet works. The Site Operator shall operate and maintain the effluent discharge works to ensure that all treated effluent is discharged to Spring Creek.

8.5.4 Modutank

1. The Site Operator shall maintain the Modutank and supporting pipes, valves, and other equipment in a manner that ensures availability and reliable operation of the Modutank during emergency conditions, including treatment plant downtimes and major storm events.

2. The Site Operator shall maintain the Modutank and related structures in a manner that does not leak beyond acceptable design tolerances based on a forty-eight (48)-hour leak test with a full head of water.

8.5.5 AMD Storage Tank

1. The Site Operator shall operate and maintain the AMD storage tank and supporting pipes, valves, and other equipment in a manner that ensures availability and reliable operation of the tank capacity for operations and storage during both routine and emergency conditions (including treatment plant downtimes and major storm events).

2. The Site Operator shall operate and maintain the AMD storage tank and related equipment in a condition that does not leak beyond acceptable design tolerances.

8.5.6 Clean Water System

1. The Site Operator shall operate and maintain the clean water system to ensure sufficient lime slurry makeup water at the treatment plant at all times and under all treatment plant inflow conditions.

2. The Site Operator shall operate and maintain the clean water intake structure stilling pool to minimize intake of sediment and debris; reduce wear on pumps, pipes, and valves; and minimize sediment loading of the clean water storage tank.

8.5.7 Sludge Drying Beds

1. The Site Operator shall maintain the integrity of the lining system and prevent filtrate from infiltrating into the groundwater beyond acceptable design tolerances.

2. The Site Operator shall prevent sludge and supernatant from overtopping the drying beds and discharging into the Flat Creek watershed drainage.

3. The Site Operator shall prevent overtopping of the filtrate pump station sump and discharge of filtrate into the Flat Creek watershed.

4. The Site Operator shall operate and maintain the sludge drying beds in a manner that maximizes separation of water from the sludge, ensures collection and conveyance of the filtrate to the filtrate pump station, and ensures conveyance of the filtrate to Spring Creek.

8.6 Site Roads

1. All roads, ditches, culverts, grates, drainage control structures, and structures supporting roadways at the Site require regular maintenance. For purposes of this SOW, the roadways are classified in Section 9.5.2 as Critical Access Roads, Important Access Roads, and Non-critical Access Roads.

2. The Site Operator shall maintain the roads in a manner that preserves or improves the existing (August 1, 2000) road surface, provides safe access, preserves the initial investment of the roadway construction, and provides reasonable ride quality.

3. The Site Operator shall maintain the roads in a fire-safe manner and in a manner that permits access for fire-fighting equipment and personnel. The Site Operator shall maintain the roadways clear of brush overhanging roadways and remove dead, dry brush near roadways.

4. The Site Operator shall keep all roads open, clear, and in good repair. The Site Operator will be allowed to close roads for maintenance or repair operations as required.

5. The Site Operator shall, at a minimum, provide the following levels of access:

    a. Continuous access on Critical Access Roads with short-duration (four [4]-hour maximum) delay allowed during major storm events (precipitation greater than 1.45 inches per hour or 9.7 inches in twenty-four [24] hours). In general, snow shall be removed from Critical Access Roads within twenty-four (24) hours. In the event of significant snow accumulation, snow removal may take longer than 24 hours, but shall be removed as expeditiously as practicable.

    b. Continuous access on Important Access Roads with intermediate duration (twenty-four [24]-hour maximum) delay allowed during major storm events (precipitation greater than 1.45 inches per hour or 9.7 inches in twenty-four [24] hours). Snow shall be removed from Important Access Roads within seven (7) calendar days, unless there are safety concerns or access is not otherwise necessary due to the availability of suitable access by other access roads for maintenance activities. These roads will be cleared as soon as practicable.

    c. Continuous access on Non-critical Access Roads with long-duration (seven [7] calendar-days maximum) delay. Snow need not be removed on Non-critical Access Roads.

6. Additional personnel and equipment shall be under contract and/or onsite or at the Site Operator's disposal to respond promptly during wet-weather operations. The Site Operator shall enumerate these additional resources required for wet-weather operation in the Annual Operations Work Plan required for submission under Section 6.3. In the Annual Operations Work Plan, the Site Operator shall update the anticipated requirements for wet-weather operations resources, and certify by a signed memorandum that these resources are contracted for or will be onsite, or at the Site Operator's disposal for the upcoming wet-weather season.

8.7 AMD Collection and Conveyance Systems

1. The Site Operator shall maintain the AMD collection and conveyance systems at a minimum of 90 percent of the flow capacity in each conveyance element.

2. The Site Operator shall prevent any leakage that is beyond acceptable design tolerances from the AMD collection systems and the AMD conveyance systems.

8.8 Brick Flat Pit

1. The Site Operator shall inspect, operate, and maintain the BFP Containment Dam in compliance with all requirements of the State of California, Department of Water Resources, Division of Safety of Dams (DSOD). To the best of EPA's knowledge, the current structure meets all requirements of DSOD and has passed the most recent annual inspection.

2. The Site Operator shall place HDS sludge in Brick Flat Pit in 12-inch loose lifts, to be compacted by track-walking with a minimum of four passes with a CAT D6 bulldozer or equivalent. If requested by the Oversight Agency, compaction testing will be performed by the Site Operator by using ASTM D 698. The final sludge surface at the end of each sludge haul shall be graded to drain, at slopes less than 5 percent, toward the filtrate riser pipes. At or near the conclusion of sludge hauls, the Site Operator shall conduct nuclear gage testing at 10 locations to provide a record of sludge density during placement. The Site Operator shall report results of the nuclear gage testing in the annual Landfill Management Report and Plan.

3. The Site Operator shall maintain all existing and planned drainage ditches, roads, and drainage structures in the Brick Flat Pit and Subsidence Areas to ensure a minimum 90 percent flow capacity of the drainage system.

4. The Site Operator shall manage Brick Flat Pit in accordance with the existing LMRP (Iron Mountain Mine 2012 Landfill Management Report and Plan) in 2013, and in conformance with the annual revised LMRP.

8.9 Subsidence Areas

1. The Site Operator shall operate and maintain all existing subsidence area caps, including the cracked ground areas and areas capped with shotcrete, in a manner that directs the maximum surface runoff away from the subsidence areas and fracture zones. The surface runoff shall be directed and controlled in a manner that does not result in detrimental erosion or other detrimental effects.

8.10 Mine Workings

1. The Site Operator shall maintain and operate the Richmond Portal, the Lawson Portal, and the Old/No. 8 Mine workings in a manner that ensures collection, conveyance, and treatment of all AMD from these three components of the Designated Contaminant Discharges. In the event that the Designated Contaminant Discharges' pathway changes, the Site Operator shall install and maintain additional collection system(s) necessary to ensure collection, conveyance and treatment of the Designated Contaminant Discharges.

2. The Site Operator shall inspect, maintain and operate the Richmond Adit, the 5-way, and drifts in a manner that ensures near-continuous, safe entry into the Richmond Adit from the portal to the 5-way, into the A Drift (for approximately 130 feet from the 5-way), into the B Drift (for approximately 225 feet from the 5-way), into the C Drift (for approximately 340 feet from the 5-way), into the D Drift (for approximately 65 feet from the 5-way), into the 5-way bypass drift connecting the Richmond Adit to the C Drift, and into the cross-cut connecting the B Drift and the C Drift (at approximately 150 feet and 160 feet from the 5-way, respectively).

3. The actual lengths of adit and drifts to be maintained were determined after completion of the rehabilitation construction in September 2003, as described in the *Richmond Adit and Drifts Rehabilitation As Built Report* (North Pacific Research, October 2004).

4. The Site Operator shall maintain and operate the Lawson Mine workings in a manner that ensures reliable, routine, safe entry into the Lawson adit from the portal to the collection point approximately 550 feet from the portal, on a once-per-month or more frequent basis, as needed.

5. The Site Operator shall maintain and operate the Old/No. 8 Mine Seep collection system in a manner that ensures diligent, selective collection and conveyance of all AMD discharges from the Old/No. 8 Mine Seep component of the Designated Contaminant Discharges.

8.11 Clean Water Diversions

8.11.1 Upper Spring Creek Diversion

1. The Site Operator shall operate and maintain the Upper Spring Creek Diversion in a manner that diverts stream flow, up to the maximum hydraulic capacity of the diversion, from Upper Spring Creek to Flat Creek at all times, except as authorized or directed by the Oversight Agency. The maximum hydraulic capacity of the diversion currently equals approximately 850 cfs.

2. The Site Operator shall operate and maintain the Upper Spring Creek Diversion stilling basin in a manner to settle out sediment particles 1/4 inch or greater in cross section at all stream flow less than or equal to 1,000 cfs.

8.11.2 ROD1 Upper Slickrock Creek Clean Water Diversion

1. The Site Operator shall operate and maintain the ROD1 Upper Slickrock Creek Diversion in a manner that diverts stream flow, up to the maximum hydraulic capacity of the diversion, from Upper Slickrock Creek around the Slickrock Creek Basin to Lower Slickrock Creek at all times, except as authorized or directed by the Oversight Agency.

The maximum hydraulic capacity of the diversion currently equals approximately 80 cfs.

2. The Site Operator shall maintain and operate the Upper Slickrock Creek Diversion stilling basin in a manner that settles out sediment particles 1/4 inch or greater in cross section.

8.11.3 ROD4 Slickrock Creek Clean Water Diversion

1. The Site Operator shall operate and maintain the Upper Slickrock Creek Diversion in a manner that collects and conveys stormflow, up to the maximum hydraulic capacity of the diversion, from Upper Slickrock Creek and South Fork Mountain around the Slickrock Creek Basin and the SCRR to Lower Slickrock Creek. The maximum hydraulic capacity, at the design depth of flow (70 percent of the pipe inside diameter), varies from 520 cfs at the intake structure near the Slickrock Creek Tailings Dam to 610 cfs at the SCRR spillway.

2. The Site Operator shall operate and maintain the Upper Slickrock Creek Diversion stilling basin in the Catfish Pond area in a manner that settles out sediment particles 1/8 -inch or greater in cross section.

8.11.4 Left-Side Water Diversions

1. The Site Operator shall operate and maintain the Left-Side Water Diversions in a manner that collects and conveys all surface-water flow up to and including the peak 100-year surface water flow from the designated drainage areas. The areas are shown in the design document *Iron Mountain Mine, Slickrock Creek Water Diversions, Design Criteria Report* (SMC, March 1999). The peak 100-year design flows are given in the document *Draft Final Iron Mountain Mine Slickrock Creek Retention Reservoir Engineering Calculations, Volume VI* (SMC, April 2000). The Site Operator shall collect and convey contaminated flow to the SCRR sedimentation basin or reservoir. The Site Operator shall direct relatively clean surface-water flow out of the SCRR catchment area.

2. The Site Operator shall operate and maintain the Left-Side Water Diversions in a manner that reduces erosion and minimizes sedimentation of the SCRR, the SCRR sedimentation basin, and Slickrock Creek.

8.12 Boulder Creek Tailings Dam

1. The Site Operator modified the Boulder Creek Tailings Dam embankment and spillway to direct storm flows to the spillway and to provide spillway capacity adequate to pass the peak 100-year storm flow (estimated at 1,650 cfs), as detailed in Section 9.11.3. Improvements to the Boulder Creek tailings dam were completed between December 2003 and October 2004 as described in the *Final Construction Report for Spillway Improvements at Boulder Creek Tailings Area* (TRC, March 2005).

2. The Site Operator shall maintain and operate the Boulder Creek Tailings Dam, the Boulder Creek streambed, and the hillslopes above the Boulder Creek streambed upstream of the tailings dam to the Boulder Creek crossing in a manner that ensures the continuous capacity of the spillway to safely pass at least the peak 100-year stormflow as per Table 14-2 (1,650 cfs) in Section 14 of *Response Action Contract No. 68-W6-0036,*

EPA Work Assignment No. 038-LST-0917, Iron Mountain Risk Assessment, Dated March 2000.

8.13 Slickrock Creek Basin

1. For all items listed under this Section: These improvements were constructed or modified as part of ROD4 work under separate contract. Testing of improvements, as well as any shakedown and startup Work, were completed prior to turning over responsibility for operation and maintenance to the Site Operator. During the Startup/Shakedown Period, the Site Operator assisted the Oversight Agency to solve operational problems at the MFTP that arose during the Startup/Shakedown Period. The Site Operator shall be responsible for operating and maintaining the facilities and addressing design and construction defects.

2. The Site Operator shall operate and maintain the Slickrock Creek Dam and SCRR in accordance with the requirements of the State of California, Department of Water Resources, DSOD.

3. The Site Operator shall maintain and operate the SCRR in a manner that maximizes operating efficiencies (up to a value of 1), defined as flow rate into the reservoir divided by flow rate out of the reservoir to the treatment plant when the inflow to the reservoir is less than 3,500 gpm. For inflows to the reservoir greater than 3,500 gpm, the flow rate to the treatment plant can be maintained at 3,500 gpm to allow for improvements in sludge quality if needed. However, discharges from SCRR will be increased to 4.000 gpm when needed to prevent overtopping of SCRR.

4. To the maximum extent practicable, all inflow into the reservoir shall be continuously discharged for treatment, with the exception of the dead pool storage.

5. The Site Operator shall not allow the reservoir to accumulate storage, except under emergency conditions, treatment plant downtime, maintenance periods, or if the inflow rate exceeds the design discharge flow rate.

6. The Site Operator shall operate the SCRR to achieve an MFTP maximum inflow rate equal to 5,500 gpm. Under peak-flow operating conditions, the SCRR target maximum operational discharge flow rate shall equal 3,250 gpm. The Site Operator shall increase the SCRR operational discharge to a maximum flow rate of 4,000 gpm once the peak AMD discharges from the Richmond and Lawson portals have safely declined from peak-flow conditions.

7. The *Draft Operations and Maintenance Manual, Slickrock Creek Retention Reservoir Project* was prepared by CH2M HILL for the Oversight Agency in June 2004.

8. The Site Operator shall maintain and operate the sedimentation basin in a manner that ensures that the maximum grain size of materials discharged from the sedimentation basin to the SCRR does not exceed 1.0 mm.

9. The Site Operator shall maintain and operate the SCRR in a manner that ensures that the maximum grain size of materials discharged from the SCRR does not exceed 0.1 mm.

10. The Site Operator shall maintain and operate the upper hematite pile and lower hematite pile tailings storage areas in a manner that minimizes erosion of the hematite into Slickrock Creek.

8.14 Boulder Creek Slide Area

1. The Site Operator shall operate and maintain the horizontal drains in a manner that maximizes collection of flow from the horizontal drains, controls the discharge from the drains in a manner that minimizes infiltration of the drainage back into the hillside, and minimizes erosion at the discharge locations.

2. The Site Operator shall operate and maintain the surface-water control ditches and structures in a manner that maximizes the conveyance of surface-water flow away from the Boulder Creek landslide area and minimizes erosion at the surface-water discharge location.

8.15 Sampling Program

1. The Site Operator shall conduct the sampling program in conformance with Section 14, *Performance Standards and Verification Plan*, and the approved QAPP.

8.16 Downgradient Property

1. The Site Operator shall provide for the long-term maintenance of the IMM remedial action improvements at downgradient property locations, including the protection of the Flat Creek embankments at the Iron Mountain Road crossing near the old main gate, adjacent to the Rardin property, at the archeological site, and at the former Finazzo property, in a manner that preserves or improves the existing (August 1, 2000) condition of these property improvements.

2. The Site Operator shall provide for long-term maintenance (or upgrade) of the Flat Creek embankment protections immediately downgradient of the Upper Spring Creek (USC) Diversion energy dissipation structure in a manner that preserves or improves the existing (August 1, 2000) condition of these embankment protections. It is important that the embankment protections are maintained, and upgraded if necessary, to ensure that the energy dissipation structure is not undermined by progressive erosion of the Flat Creek channel.

3. The Site Operator shall perform emergency response actions related to the county road and bridges that may be necessary to ensure access of personnel, supplies, and equipment to the Site to ensure continuous performance of the IMM remedial action.

8.17 Mine Waste Disposal Facilities

1. The Site Operator shall provide for the long-term maintenance of each of the mine waste disposal facilities constructed as part of the IMM Remedy (including the disposal cell constructed upgradient from the Richmond Mill buildings area, the WR-8 and WR-9 mine waste cell, the capped cell at Pond No. 2 at the Temporary Treatment Plant, and the muck disposal cell [also called Mine Waste Disposal Cell]) consistent with the original design and in a manner that preserves or improves the existing (August 1, 2000) function and condition of these facilities. The muck disposal cell construction was

completed in 2002 (*Richmond Adit Mine Waste Repository Cell – Final As-Built Report*, August 28, 2002). The lined disposal cell was constructed at Road Marker 19.

2. The Site Operator shall provide for long-term maintenance of the surface-water controls constructed to minimize surface-water erosion of historic mine waste piles in the Slickrock Creek and Boulder Creek basins in a manner that preserves or improves the existing (August 1, 2000) function and condition of these facilities. Improvements to facilities in some of these areas were constructed as part of ROD4 work under separate contract.

3. If a failure of an historic mine waste pile occurs, the Site Operator shall re-stabilize the remaining mining waste in a manner consistent with the existing (August 1, 2000) function and condition of the waste pile. If such a failure occurs, the Site Operator shall also remove, to the extent practicable as determined by the Oversight Agency, taking into consideration economic and technical constraints, mining wastes from surface waters that drain Iron Mountain, surface-water conveyances, roadways, or other features of the IMM Remedy, and place the recovered mine wastes in a stable disposal area, as approved by the Oversight Agency.

8.18 Failure to Attain Performance Standards

1. In the event that the Oversight Agency determines that modification to the O&M Plan is necessary to meet applicable Performance Standards or other requirements of this SOW, the Oversight Agency may notify the Site Operator that the Site Operator shall modify the O&M Plan. The Site Operator may invoke the Dispute Resolution procedure of the Consent Decree if it disputes the Oversight Agency's request for modification.

2. Unless otherwise directed by the Oversight Agency, within sixty (60) days of receipt of notice from the Oversight Agency that modification to the O&M Plan is necessary, the Site Operator shall submit for approval by the Oversight Agency a modification to the O&M Plan that will achieve the Performance Standards or other requirements of this SOW. The modified O&M Plan shall also be submitted to the Support Agency for review and comment. The modified O&M Plan may call for, among other things, additional response activities consistent with this SOW.

3. If RD or RA work activities are required to achieve Performance Standards or other requirements of this SOW, the Site Operator shall achieve in a reliable and safe manner as determined by the Oversight Agency, the Performance Standards and the design criteria for the respective O&M Units and other requirements of this SOW.

4. Subject to Section 7.15 of this SOW and notwithstanding any action by the Oversight Agency or other State or Federal agency, the Site Operator remains fully responsible for achieving all Performance Standards and other requirements of this SOW.

5. Nothing in this SOW, or in the Oversight Agency's approval of any submission, shall be, or be deemed to constitute, a warranty or representation of any kind by the Oversight Agency that full performance of an approved RD, RA, Work Plan, or other action will achieve the Performance Standards and other requirements of this SOW. The Site Operator's compliance with such approved documents does not preclude the Oversight Agency from seeking additional Work consistent with this SOW to achieve the Performance Standards and other requirements of this SOW.

9. Routine and Non-routine O&M

9.1 Routine O&M

1. This Section presents a brief description of the O&M Units and Routine O&M activities believed to be necessary to meet the Performance Standards. Notwithstanding the prior sentence, the Site Operator shall be responsible to undertake additional O&M activities consistent with the Consent Decree and SOW and necessary to meet the Performance Standards and other requirements of this SOW.

2. The Site Operator shall conduct Routine O&M activities at the O&M Units listed in this Section and at all other locations that, while not specifically designated as an O&M Unit, may affect the performance of the O&M Units or the IMM Remedy.

3. The Site Operator shall diligently perform Routine O&M of the O&M Units, and the IMM Remedy to achieve the Performance Standards and the other requirements of this SOW.

4. The Site Operator shall operate the MFTP and other O&M Units in a manner consistent with the site O&M Plan.

9.2 Non-routine O&M

1. Non-routine O&M includes inspection, operation, and maintenance activities that are required on an irregular or less frequent basis than Routine O&M. These activities include, but are not limited to, the O&M Units and O&M requirements described in the Non-routine O&M sections of this SOW. The Site Operator shall include in the management plans and reports Non-routine O&M necessary to achieve the Performance Standards and other requirements of this SOW.

2. The Site Operator shall diligently perform Non-routine O&M of the O&M Units, and the IMM Remedy to achieve the Performance Standards and the other requirements of this SOW.

3. Non-routine O&M will be required as a result of changes in Site conditions, deterioration of existing structures and facilities, and additional known and unknown Site conditions.

4. The Oversight Agency agrees to assign the warranty rights that the Oversight Agency has with respect to the Site facilities but only if there is no obligation on behalf of a governmental agency to indemnify such contractor, provided further that such assignment is not prohibited, and provided further that such assignment shall terminate in the event of a Work Takeover by the Oversight Agency or at the end of the Performance Period, whichever is first.

5. The Site Operator shall perform upgrades to the O&M Units, as necessary, to achieve the Performance Standards and other requirements of this SOW. Notwithstanding this obligation to perform upgrades, this SOW shall not include the following upgrades, except as set forth in Paragraph 6 of this Section 9.2:

    a. Constructing an additional reactor to increase the capacity of the treatment beyond 6,500 gpm;

b. Increasing the flow capacity of the primary AMD Pipeline Conveyance System beyond the current design capacity;

c. Increasing the hydraulic capacity of the MFTP beyond the upgraded capacity constructed in connection with ROD4;

d. Constructing an additional thickener to increase thickener capacity beyond the current design intent;

e. Enlarging the SCRR beyond its current design capacity;

f. Increasing the capacity of the AMD storage tank, or the Modutank used for AMD storage;

g. Increasing the size of the Brick Flat Pit Containment Dam or the capacity of the associated sludge placement area beyond the capacity of the Stage II dam construction cited in Section 9.7.3(1);

h. Increasing the size or number of sludge ponds at the Minnesota Flats Treatment Plant;

i. Increasing the size or capacity of the effluent discharge tunnel or piping;

j. Increasing the capacity of the Spring Creek diversion tunnel or associated works, such as intake or outfall structures;

k. Increasing the capacity of the Slickrock Creek diversion pipes;

l. Adding any roads or bridges;

m. Updating or increasing the capacity of any electronic, computer or telemetry systems more frequently than every 5 years, except at the option of the Site Operator; and

n. Increasing the size or capacity of power lines and transformers, except in the case where the Site Operator undertakes to expand the need for such system.

6. The above limitations, however, do not apply if the upgrades are necessary as a result of an extreme event that causes a significant change in AMD production such that the capacity of the current facilities is exceeded on a regular basis or the Site Operator elects to make any of the upgrades specified in Paragraph 5 of this Section 9.2. If such modifications are required, the modifications to the Performance Standards shall be within the scope of this SOW to the extent that such modifications are required to collect and treat all Designated Contaminant Discharges using the HDS treatment process.

7. Other than the narrow limitations on upgrades as specified above in Paragraph 5 and modified in Paragraph 6 of this Section 9.2, the above limitations do not limit the obligations to operate, repair, upgrade, and maintain the IMM Remedy, including but not limited to the O&M Units and O&M Unit Components described in Section 9.

8. For any failure, peril, or condition that is not an Extreme Event as defined in Section 11 of this SOW, the Site Operator shall take all steps necessary to respond to, repair, and

correct problems created by any and all failures, or risk of failures, that threaten, endanger, or have interrupted continuous collection, conveyance for treatment, and treatment of Designated Contaminant Discharges or that otherwise threaten to interfere with the ability of the Site Operator to reliably achieve the Performance Standards or other requirements of this SOW under all conditions; provided, however, the Site Operator's obligations under this Section 9.2(8) shall not affect its ability to recover for such Extreme Events under the Policy.

9.3 Minnesota Flats Treatment Plant

9.3.1 Unit Description

1. The Minnesota Flats Treatment Plant (MFTP) is a high density sludge (HDS) treatment plant constructed to treat all AMD discharges from the Richmond, Lawson, and the Old/No. 8 Mine workings. As of June 2000, the treatment plant had a nominal treatment capacity of approximately 2,500 gallons per minute (gpm). This capacity was increased (under separate contract) in 2001 to approximately 6,500 gpm to treat the contaminant flow from the SCRR.

2. The HDS treatment plant was constructed in two stages. Stauffer Management Company (SMC) designed and constructed an aerated simple mix (ASM) treatment plant at Minnesota Flats in response to EPA Orders 93-01 and 94-12. The ASM plant began operation in September 1994, treating discharges from the Richmond and Lawson portals. Flows from the Old/ No. 8 Mine Seep were added to influent flows at the MFTP in October 1994. EPA constructed the HDS treatment plant at the MFTP, with startup in January 1997. The treatment plant systems are computer-monitored and -controlled. Flowmeters at the Richmond portal, the Lawson portal, SCRR, and the Old/No. 8 Mine transmit flow data via telemetry systems to the treatment plant.

3. The treatment process involves oxidation of ferrous iron to produce a more chemically stable sludge. Historically, during lower flow periods (characterized as less than 400 gpm for this Paragraph), full oxidation has generally been achieved using one blower and reactor. During higher flow periods, two blowers and reactors have historically been required to achieve full oxidation.

4. The treatment plant is capable of operating in the ASM or HDS treatment modes. However, experience to date indicates that the HDS process reduces the sludge volume by more than 50 percent compared to the ASM process, improves handling characteristics of the sludge, and enables operation of Brick Flat Pit as a dry landfill in a cost-effective manner.

5. The Site Operator will need to repair or replace major and minor equipment at the plant on a regular basis. Frequent maintenance, repair, and less frequent replacement is expected to be needed for small motors, small valves, small pumps, small mixers, small tanks, and supports and components subject to vibration, movement, corrosion, or abrasion.

6. O&M Unit Components for the MFTP include but are not limited to:

   a. All buildings;
   b. Tanks;

c. Silos, feed systems, lime systems;
d. Mixers;
e. Walkways;
f. Platforms;
g. Roadways;
h. Culverts;
i. Pumps;
j. Pipes;
k. Support structures;
l. Reactors;
m. Thickener;
n. Valves, motors, electrical equipment;
o. Sampling devices;
p. Process control equipment and systems, including telemetry systems;
q. Emergency generators, emergency lights, fuel systems;
r. Blowers;
s. Truck scales; and
t. All other miscellaneous equipment currently in use for operation of the treatment plant or intended for use during the Performance Period of the Consent Decree and this SOW.

9.3.2 Routine O&M Requirements for the Minnesota Flats Treatment Plant

1. The Site Operator shall inspect, operate, maintain, repair, replace and upgrade the MFTP in a manner that conforms to the *Operations and Maintenance Instructions, High Density Sludge Treatment Plant, Iron Mountain Mine-Redding, CA*, included by reference as Attachment E, and achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall operate the HDS plant in a manner that optimizes (maximizes) terminal sludge density. Unless otherwise approved by the Oversight Agency, the Site Operator shall operate and maintain the treatment plant in conformance with the following sludge wasting practice:

   a. Initiate sludge wasting at a reactor sludge density of over 40 but not greater than 45 percent solids; and
   b. Terminate sludge wasting at a reactor sludge density of less than 32 but not less than 25 percent solids.

3. The Site Operator shall operate the HDS plant in a manner that fully oxidizes the sludge prior to discharge to the sludge drying beds.

4. Unless otherwise approved by the Oversight Agency, the Site Operator shall operate and maintain the treatment plant in conformance with the pH control practice as of the Effective Date of this SOW. The current pH control practice requires that the reactor have a pH of 8.4 or higher at all times.

5. The sludge wasting density requirements shall not apply during brief periods that require wasting of sludge to perform facility maintenance, such as centerwell pump changeout, centerwell pump cleanout, and thickener dewatering. The Site Operator

shall notify the Oversight Agency within two (2) Working Days of situations that have required temporary modification of the target sludge density requirements. The Site Operator shall perform maintenance in a manner that minimizes the extent to which sludge is wasted in a manner that does not comply with the normal sludge wasting practice.

6. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade all systems, including but not limited to electrical, mechanical, structural, civil, fuel, and process systems.

7. Components of the MFTP including, but not limited to, the exterior side walls of the reactors, thickener, platforms, troughs, tanks, piping, support structures, roads, and other equipment, are subject to continuous discoloration and staining from sludge, effluent, sprays, and/or mists originating from the reactors, mixing tanks, wind action on the thickener, sludge handling, and routine operation of the O&M Unit Components. The Site Operator shall inspect these structures and all other exposed parts on a weekly basis. The Site Operator shall clean these structures to achieve and maintain a clean, well-kept appearance. The Site Operator shall inspect painting and coating on a quarterly basis and annually conduct touch-up painting, comprehensive painting, and equipment coating programs to maintain the paint and other coatings on the facility components.

8. The Site Operator shall provide approved containers for collection and disposal of waste materials, debris, and rubbish. The Site Operator shall pick up and legally dispose of debris and trash on a frequent basis, sufficient to maintain a well-kept appearance at the Site.

9. The Site Operator shall store onsite at all times spare parts and special tools recommended by the equipment manufacturers for routine operation and maintenance, except to the extent that the Oversight Agency has pre-approved in writing deviation from the manufacturer's recommendation. The requirement in the prior sentence does not apply to office equipment. Additionally, the Site Operator shall maintain onsite at all times any ordinary tools and equipment expected to be on hand for operation and maintenance (including but not limited to cosmetic upkeep) of this facility. Upon request from the Oversight Agency, the Site Operator shall allow for an immediate inspection to identify the tools and spare parts in inventory.

9.3.3 Non-routine O&M Requirements for the Minnesota Flats Treatment Plant

1. Non-routine O&M for the MFTP shall include, at a minimum, the components listed in this Section.

2. During utility company electrical supply outages, the Site Operator shall take all means necessary to ensure continuous operation of the HDS treatment plant facilities, including but not limited to, conducting extended operation of the treatment plant using backup and rental generators. The Site Operator is hereby notified that the Site currently has limited fuel storage capacity and that the Site is subject to short- or long-duration utility company power outages.

3. The Site Operator shall repair or replace principal sludge conveyance equipment components as necessary, including but not limited to, sludge return pumps located in the thickener centerwell, sludge return piping, valves, connections, miscellaneous equipment, and the sludge conveyance troughs. The sludge is corrosive and abrasive. Because the fluid velocity in the sludge return piping exceeds 8 to 9 feet per second, the Site Operator should expect that sludge conveyance equipment will require relatively frequent replacement.

4. The Site Operator shall repair or replace all other principal equipment components as necessary, including but not limited to, mixer motors, gear drives, wood decking covering the reactors, lime systems, blowers and the air delivery system, non-potable water delivery systems, tanks, baffles, valves, and all supporting structures. The Site Operator is hereby notified that the reactor platform structure above and adjacent to TK1 and TK2 vibrates at levels that may cause pipe and valve connections, motors, and all other equipment supported by the structure to require frequent repair, maintenance, or replacement.

5. The Site Operator shall inspect, maintain and repair the thickener wall, rake and centerwell. The Site Operator is hereby notified that the AMD influent and the discharge from the reactors is highly corrosive. This has resulted in corrosion of the inside of the thickener tank wall at numerous locations. Locations were patched with a coating in summer 1999. A cathodic protection system was installed in the thickener in the Fall of 2000 under a separate contract as described in the *Operations and Maintenance Plan* (IT Iron Mountain Operations, LLC, 2001a). The Site Operator replaced the thickener interior coating system (liner) in 2002. The Site Operator shall operate, maintain, repair and replace, or upgrade, as necessary, the cathodic protection system and the thickener liner to protect the thickener from corrosion. The Site Operator shall dewater the thickener each summer, or as required, to ensure long-term performance of the thickener and conduct an inspection of the thickener tank wall and other components for corrosion or deterioration. The Site Operator shall conduct an annual inspection and test of the cathodic protection system. The Site Operator shall perform repairs to the liner and cathodic protection system to ensure long-term reliable performance of the thickener.

6. The Site Operator shall maintain the hillslope benches above the thickener to control erosion, reduce surface water entering the roadway around the thickener, and reduce groundwater recharge. The Site Operator is hereby notified that during heavy or extended rain events, groundwater seeps have been observed discharging from the hillslope near the roadway around the thickener and within the road foundation, but to date, these seeps have not presented a problem.

7. During exceptional conditions, HDS or ASM sludge may need to be excavated from the sludge drying beds during the winter and stored in BFP on a temporary basis, prior to placement as an engineered fill. If the Site Operator intends to store ASM or HDS sludge in BFP on a temporary, emergency basis, the Site Operator shall submit a plan to the Oversight Agency for review and approval. As a minimum, the plan shall meet the performance requirements listed in Section 9.7.3(3).

9.4 Treatment Plant Ancillary Facilities

9.4.1 Unit Description

1. The treatment plant ancillary facilities are defined as those facilities adjacent to the MFTP that are required for operation of the treatment plant. Examples of the treatment plant ancillary facilities and the O&M Unit Components include, but are not limited to, the following:

   a. All roadways within and adjacent to the treatment plant and sludge drying beds;

   b. The emergency storage tank, including piping, valves, and miscellaneous equipment;

   c. The hillslopes above and below the emergency storage tank and the treatment plant, including drainage ditches and benches;

   d. The hillslopes supporting the treatment plant and the sludge drying beds, including drainage ditches and benches;

   e. The effluent discharge works, including the intake, piping, outlet works, and dike separating the outlet works from Spring Creek;

   f. The Modutank, including piping, valves, supports, and miscellaneous equipment;

   g. The clean water system, including the intake structure at the Upper Spring Creek Diversion, stilling basin, pumps, generator, piping, valves, storage tank, and miscellaneous equipment;

   h. The sludge drying beds, including clean water system; ASM and HDS sludge piping; the truck wash station; drainage ditches; culverts; drying bed liner system, including geotextile layers, geosynthetic clay liner, and XR-5 membrane; filter and drainage aggregates; drainage piping; and stormwater drainage collection and conveyance system;

   i. The filtrate pump station, including pumps, piping, electrical, valves, equipment building, miscellaneous equipment, and the emergency generator;

   j. All other hillslopes in the vicinity of the MFTP; and

   k. All other equipment, systems, and features that may be necessary to operate and maintain the MFTP in a reliable manner.

2. The treatment plant ancillary facilities were constructed during and after construction of the ASM treatment plant in 1994. The emergency holding tank and the effluent tunnel were constructed in 1999.

3. The sludge drying beds were used for holding ASM sludge beginning in 1994 though the startup of the HDS treatment plant in 1997. Because of the difficulty of excavating the high water-content ASM sludge, the lining systems may have been damaged during excavations for sludge haulage. The lining system for Drying Bed 1 (most southwest bed) was partially repaired in 1998. The BFP sludge disposal site is intended to store only HDS sludge. Temporary and permanent storage of ASM sludge will require

additional actions and approvals. In the last year of the Performance Period, the Site Operator shall remove sludge from the drying beds in the Fall, but need not remove sludge from the drying beds after the Fall sludge haul.

9.4.2 Routine O&M Requirements for Treatment Plant Ancillary Facilities

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the Treatment Plant Ancillary Facilities in a manner that ensures reliable performance of the IMM Remedy and in a manner that achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade all O&M Unit Components of the Treatment Plant Ancillary Facilities used now or at any time during the Performance Period in connection with the MFTP.

3. Components of the Treatment Plant Ancillary Facilities are subject to continuous discoloration and staining from sludge, effluent, sprays, and/or mists originating from the reactors, mixing tanks, wind action on the thickener, sludge handling, and routine operation of the O&M Unit Components. The Site Operator shall inspect these structures and all other exposed parts on a weekly basis and shall clean these structures to achieve and maintain a clean, well-kept appearance. The Site Operator shall inspect painting and coating on a quarterly basis and annually conduct both touch-up and regular painting and coating programs to maintain the paint and other coatings on the facility components.

4. The Site Operator shall inspect and clean the Modutank and otherwise perform regular maintenance on a schedule that ensures reliable operation of the Modutank.

5. The Modutank shall be kept empty during normal operation except for a minor amount (i.e., less than one foot) of clean water to protect the tank lining from solar degradation during the summer. Flow to the treatment plant will ordinarily bypass the Modutank and flow through the 1-million-gallon emergency storage tank. If an emergency plant shutdown occurs, the discharge valve on the storage tank will be closed and the storage tank will fill. If the liquid level in the storage tank rises to the high-level alarm point (2 feet of freeboard), flow will be diverted to the Modutank. After the treatment plant is returned to operation and the water level returns to a safe level in the storage tank, the Site Operator shall meter flow from the Modutank at a constant rate back into the storage tank.

9.4.3 Non-routine O&M Requirements for Treatment Plant Ancillary Facilities

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the drainage ditches, culverts and hillslopes in the area of the treatment plant. These include, but are not limited to, the hillslopes above and below the treatment plant, the hillslope above and below the emergency holding tank, the hillslope directly west and below Iron Mountain Road above the access road to the effluent tunnel outlet works, the hillslopes supporting the sludge drying beds, and the hillslopes in the area of the Upper Spring Creek Diversion Impact Structure. The Site Operator shall conduct annual inspections, or more frequently as required, and perform maintenance of these hillslopes, adjacent drainage ditches, and culverts.

2. The Site Operator shall conduct an annual evaluation of the sludge drying beds and shall repair or replace components of the sludge drying beds that pose a risk of no longer meeting the Performance Standards. The annual review shall, at a minimum, include evaluation of the sand filter layer and upper geotextile layer. The components below the upper geotextile (lower geotextile, drainage layer, geosynthetic clay layer, drainage piping, and XR5 membrane) will be evaluated as required if there are drainage issues or if the underlying drainage material is exposed to sludge, or if the Oversight Agency requests this review based on concerns regarding performance.

3. The Site Operator shall retain a qualified liner expert. The Site Operator's liner expert shall conduct an annual inspection of the Modutank. The inspection shall include a forty-eight [48]-hour leak test with a full head of water. The Site Operator's liner expert shall provide a written report detailing the results of the inspection and design recommendations for repair or replacement of the liner or liner support structures. If repairs are required due to leakage beyond the manufacturer's recommended tolerances, the Site Operator shall make such repairs. After completion of any repairs, a second leak test may be required, at the discretion of the Oversight Agency, depending on the extent of the liner repairs. Upon completion of the repair or replacement, the Site Operator's liner expert shall prepare a report certifying the capability of the Modutank to provide reliable emergency storage for the upcoming year. The Site Operator's Project Manager shall sign the report.

4. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the effluent tunnel discharge works, including the protective dike separating the outlet works from the main Spring Creek channel. This protective dike is subject to erosion or overtopping during moderate to severe storm events, particularly if the Upper Spring Creek Diversion, located upstream from the outlet works, is closed. The Site Operator shall repair all failures of this protective dike.

5. In coordination with the Oversight Agency, the Site Operator shall inspect and maintain the Flat Creek Stream Channel between the Upper Spring Creek Diversion Impact Structure and 500 feet downstream from Flat Creek Bridge. The Site Operator shall conduct annual inspections and repairs/upgrades, or more frequently during and after major storm events, if requested by the Oversight Agency or in response to failure of the stream banks reported by the property owners.

9.5 Roads

9.5.1 Unit Description

1. The Iron Mountain roads include more than 10 miles of roadways that must be maintained by the Site Operator. Iron Mountain Road near the treatment plant, the road within the treatment plant area, and the road from the Iron Mountain Road to the sludge drying beds are paved roads. All of the roads above the MFTP have a road base or native materials surface that is subject to significant erosion if ditches and culverts are not maintained, prior to, during, and after large storm events (greater than a 5-year storm event). In general, less significant damage is expected with storms less severe than a 5-year storm event.

2. The Iron Mountain access roads are built in steep terrain and are subject to extreme rainfall and massive erosion. The access roads are essential to reliable performance of the IMM Remedy. Erosion of the hillslopes above the roadways during storm events has the potential to convey sediment into drainage ditches, reducing the capacity of the ditches, plugging culverts, and resulting in washout or damage to the roadways.

3. Under EPA Orders 93-01 and 94-12 issued pursuant to ROD2 and ROD3, SMC designed and reconstructed drainage ditches and culverts in the vicinity of the MFTP to convey the 25-year peak stormflow. Minor failures of these ditches and culverts have occurred during repeated 5- to 15-year storm events that have occurred since 1995. To date, the main failure mode of the ditches has been erosion of the rockfill protecting the underlying decomposed granite and deposition of sediment causing blockage of the culverts.

4. Under ROD4, the drainage ditches, culverts, and creek crossings from the MFTP to Boulder Creek Crossing and from Boulder Creek Crossing to the Slickrock Creek Basin have been redesigned to convey the nominal 100-year peak stormflow.

5. Retaining walls and pipelines located on the Iron Mountain Road between the MFTP and Brick Flat Pit and the Jeep Road between the temporary treatment plant and the SCRR site have been designed to accommodate HS 20 loading.

9.5.2 Roadway Classifications and Maintenance

1. All roads, ditches, culverts, grates, drainage control structures, and structures supporting roadways at the Site require regular maintenance. For purposes of this SOW, the roadways are classified as Critical Access Roads, Important Access Roads, and Non-critical Access Roads. At a minimum, the Site Operator shall provide the levels of access as defined in Section 8.6.

2. The access roads shall be maintained according to the importance of access. This SOW defines three levels of maintenance: Full, Partial, and Limited Maintenance:

   a. Full Maintenance includes the following:

      i. Road maintenance prior to and during all storm events;

      ii. Annual regrading of roadway with pavement or roadbase placed to maintain grading and road condition, as needed, to repair rutted surfaces, potholes, gullying, and erosion surfaces; and

      iii. Drainage control structures and ditches shall be cleaned

         (1) Annually to restore full drainage flow capacity; and

         (2) At other times (including during storm events) as needed to ensure a minimum of approximately 80 percent of drainage flow capacity at all locations at all times.

   b. Partial Maintenance includes the following:

      i. Annual regrading of roadway with roadbase placed to maintain grading and road condition, as needed, to repair rutted surfaces, potholes, gullying, and erosion surfaces; and

ii. Drainage control structures and ditches shall be cleaned

(1) Annually to restore all drainage flow capacity; and

(2) At all other times (including during storm events) as needed to ensure a minimum of approximately 80 percent of full drainage capacity at all locations at all times.

c. Limited Maintenance includes the following:

i. Annual regrading of roadway with roadbase (or suitable local fill not consisting of significant organic or clayey material for roadways that do not have roadbase) placed to maintain grading and road condition, as needed, to repair rutted surfaces, potholes, gullying, and erosion surfaces; and

ii. Drainage control structures and ditches shall be cleaned

(1) Annually; and
(2) As needed, to maintain road drainage.

9.5.2.1 Critical Access Roads

1. The roads listed in this Section are designated Critical Access Roads. The Site Operator shall provide continuous access, as defined in Section 8.6, and shall maintain Critical Access Roads as defined in Section 9.5.2.

2. Iron Mountain Road from the property boundary to the Emergency Storage Tank—The Site Operator shall maintain access for highway and two-wheel-drive vehicles. The road shall be paved and have Full Maintenance.

3. Iron Mountain Road from the Emergency Storage Tank to Richmond Mill buildings—The Site Operator shall maintain access for all-weather Site inspections, maintenance of the Richmond adit and surface-water diversions for the Boulder Creek landslide, and access by construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

4. Jeep Road from Iron Mountain Road to the Slickrock Creek Dam—The Site Operator shall maintain access for all-weather dam inspection, dam operations and maintenance, and access by emergency construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

5. SCRR Dam Road from Jeep Road to the Slickrock Creek Dam crest—The Site Operator shall maintain access to the dam crest for all-weather dam inspections, maintenance, and access by heavy construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

6. Slickrock Creek Dam Road from Slickrock Creek Dam to the sedimentation basin and Old/No. 8 Mine pump station and grit chambers—The Site Operator shall maintain access to the reservoir, reservoir outlet works, sedimentation basin, grit chamber, and Old/No. 8 Mine pumps for all-weather inspections, maintenance, and access by con-

struction equipment. These are all-weather access roads. The road shall be maintained with roadbase and have Full Maintenance.

7. Lawson Road from Iron Mountain Road to the Lawson portal—The Site Operator shall maintain access to the Lawson adit, Lawson grit chamber, and Boulder Creek crossing at Lawson portal for all-weather inspections, maintenance, and access by construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

8. Richmond portal access road from Iron Mountain Road to the Richmond portal—The Site Operator shall maintain access to the Richmond portal, Richmond grit chamber, and AMD pipeline for all-weather inspections, maintenance, and access by construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

9. Upper Spring Creek Diversion Road from Iron Mountain Road to Upper Spring Creek Diversion drop structure—The Site Operator shall maintain access to the drop structure, clean-water intake pumps, pipes, emergency generator, and drop structure stilling basin for inspections, maintenance, and access by construction equipment. This road is designated an all-weather access road. The road shall be maintained with roadbase and have Full Maintenance.

9.5.2.2 Important Access Roads

1. The roads listed in this Section are designated Important Access Roads—The Site Operator shall provide continuous access, as defined in Section 8.6, and shall maintain Important Access Roads as defined in Section 9.5.2.

2. Brick Flat Pit access road from Iron Mountain Road to Brick Flat Pit—The Site Operator shall maintain access to Brick Flat Pit landfill drainage control structures, ditches, landfill liner system, filtrate collection system, and filtrate riser pipes for all-weather inspections, maintenance, potential wet-weather sludge haulage, and access by construction equipment. The road shall be maintained with road base and have Full Maintenance.

3. Road 27 from Iron Mountain Road to the sedimentation basin—The Site Operator shall maintain access to the hematite pile, left-side water diversions, drainage ditches, and water control structures for all-weather inspections, maintenance, and access by construction equipment. The road shall be maintained with roadbase and have Full Maintenance.

4. Impact Structure access road from Iron Mountain Road to the Upper Spring Creek Diversion impact structure—The Site Operator shall maintain access to the impact structure and drainage ditches for all-weather inspections and maintenance. The road shall be maintained with roadbase and have Full Maintenance.

5. Brick Flat Pit access roads from Brick Flat Pit to West Rim of Brick Flat Pit, Subsidence Areas and Upper Boulder Creek—The Site Operator shall maintain access to the west rim of BFP, subsidence areas (Locations A, B, C, D, E, F, G, and H on Plate 1, located at the end of this document, following Section 14), emergency treatment plant sludge storage location, and Waste Pile 1 for inspections, maintenance, and access by construction equipment. The roads shall be maintained with roadbase or other suitable

local fill not consisting of significant organic or clayey material and have Partial Maintenance.

6. BCMO Road from Iron Mountain Road to the mouth of Boulder Creek and the effluent tunnel outlet works—The Site Operator shall maintain access to the mouth of Boulder Creek weir and sampling station, access road to the mouth of Slickrock Creek sampling station (SRMO), and effluent tunnel outlets works for inspections, sampling, maintenance, and access by construction equipment. Access is needed for sampling activities during all-weather conditions. This road is cut in decomposed granite and native materials. This road shall be maintained with Partial Maintenance.

9.5.2.3 Non-critical Access Roads

1. The roads listed in this Section are designated Non-critical Access Roads. The Site Operator shall provide access, as defined in Section 8.6, and shall maintain Non-critical Access Roads as defined in Section 9.5.2.

2. Brick Flat Pit access roads from Brick Flat Pit to Slug Gulch, Upper Slickrock Creek, and the U.S. Bureau of Reclamation (USBR) Clean Water Diversion intake structure—The Site Operator shall maintain access to Upper Slickrock Creek and the USBR intake structure for limited inspection, access, and maintenance. This road is cut in native materials. Limited Maintenance is required for this access road.

3. Hornet Portal Road from Lawson Road to Boulder Creek Crossing at the Hornet portal—The Site Operator shall maintain access to the Hornet portal for limited inspections. This road is cut in native materials. Limited Maintenance is required for this access road.

4. SRMO Road from BCMO to SRMO—The Site Operator shall maintain access to the SRMO sampling station and Spring Creek weir sampling station (SCWIR). This road is cut in native materials. Limited Maintenance is required for this access road.

9.5.3 Routine O&M Requirements for Roads

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade roadways to ensure reliable performance of the IMM Remedy to achieve the Performance Standards and the other requirements of this SOW. This includes, among other things, routine, regular removal of sediment from ditches and culverts prior to and during the winter months, road grading and resurfacing to minimize rut formation and gullying, and active maintenance throughout major storm events.

2. The Site Operator shall conduct an active road monitoring program and shall repair road locations consistent with Section 8.6 of this SOW that fail or show signs of impending failure. Repair of the roads and supporting structures shall be completed at all locations showing deterioration of the supporting structures and at locations where sediment and debris sloughs onto the roads or off the hillslopes supporting the roads. In addition, the Site Operator shall monitor areas of unusual road damage and provide design recommendations for repair.

3. Fire control and prevention is an important component of O&M for roadways. For all access roads listed in this Section, the Site Operator shall remove and properly dispose

of dead and downed brush and trees adjacent to the roadways. Proper disposal includes chipping or burning at an approved burn location.

4. The Site Operator shall either have road construction equipment and personnel onsite during wet winter months or shall have a subcontract in place or at the disposal of the Site Operator to ensure delivery of the equipment and equipment operators pursuant to Section 8.6.

5. If the Site Operator constructs new roads in connection with the Work, the Site Operator shall include maintenance procedures in the O&M Plan and shall maintain the roads in conformance with that plan.

9.5.4 Non-routine O&M Requirements for Roads

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade all wire retaining walls used to support the roadways throughout the site. The wire walls were constructed using wire mesh that is subject to corrosion if exposed to AMD. Because of uncertainties related to groundwater and surface-water quality at all locations, these retaining walls may be exposed to AMD. The Site Operator shall monitor the wire walls and repair and replace walls that corrode or fail as a result of other loading conditions or for any other reason.

2. To minimize erosion of the hillslopes, SMC constructed downdrains to carry stormwater from culverts down the slopes to Boulder and Slickrock creeks. The downdrains consist of pipelines that are anchored on the hillslopes and extend from the culverts for various distances down the slopes. The competency of the hillslope at the downdrain anchors and outfalls varies considerably between installations, and includes weathered bedrock, cobbles, colluvium, and undifferentiated soils. The effectiveness of reliability of the downdrains during high flow conditions is not known at this time because generally dry conditions have existed since the system was installed. The performance of the downdrains, the stability of the anchors, and the susceptibility of the outfall locations to erosion is not certain. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the downdrains to ensure stormflow conveyance and minimize hillslope erosion.

3. The Flat Creek Bridge, located downstream of the Iron Mountain Road Gate on the County road, is a vital element in the road system for site access by employees, equipment, and materials. In particular, during high flow conditions, the bridge is essential to continuous supplies of lime. While the bridge is designed to pass the 100-year flood events without failing, the bridge abutments are subject to erosion at smaller storm events. In addition, the stream bank upstream of the bridge is subject to erosion at smaller storm events. The Flat Creek Bridge is owned by Shasta County, and it is the County's responsibility for maintenance. In coordination with the Oversight Agency, in an Emergency Response situation, the Site Operator shall take Emergency Response actions related to the County road and bridges that may be necessary to ensure Site access to implement the IMM Remedy.

9.6 AMD Collection and Conveyance Systems

9.6.1 Unit Description

1. The AMD collection and conveyance system is the system used to monitor, capture, and convey the Designated Contaminant Discharges to the MFTP. The current system consists of high-density polyethylene (HDPE) pipelines, grit chambers, check dams, risers, air relief valves, pumps, electrical systems, process control systems, telemetry systems, leak detection systems, and backup systems as needed.

2. The AMD collection and conveyance systems currently include the following:

   a. The AMD conveyance system from the Richmond and Lawson mine workings is a gravity-flow system employing approximately 17,000 feet of 18-inch-diameter SDR 17 HDPE pipe. The pipeline starts at the Richmond grit chamber at Elevation 2,600 feet, runs approximately 500 feet along the Richmond portal access road, and travels downslope within the Boulder Creek landslide approximately 1,000 feet. There it connects with the pipeline from the Lawson grit chambers at Elevation 2,170 feet. From this connection, located on top of the pipe bridge above Boulder Creek, the pipe is buried in the Lawson Road for about 2,800 feet to Boulder Creek Crossing. The pipeline then travels approximately 13,000 feet from the Boulder Creek crossing to the MFTP.

   b. An additional 24-inch-diamter SDR 17 HDPE pipeline was constructed in 1999 to carry SCRR flow from Boulder Creek Crossing to the MFTP. The 24-inch-diameter piping is interconnected with the 18-inch-diameter piping beneath the roadway near the former Boulder Creek Cementation Plant, allowing the use of either piping system to carry flow from the Richmond, Lawson, and Old/No. 8 mines, and from SCRR during low-flow conditions. During elevated flow conditions, the 24-inch-diameter pipe is required to carry SCRR flow.

   c. Most of the pipeline from the Richmond portal to the MFTP is buried inside a PVC liner system that serves as a leak detection system. The pipeline is buried in a concrete backfilled trench within the Boulder Creek landslide and for a portion of the segment from near the Lawson portal to the Boulder Creek Crossing.

   d. The AMD conveyance system from the Old/No. 8 Mine workings is a combination pumped and gravity-flow system employing two pumps, which penetrate the No. 8 Mine workings and SDR 17 HDPE piping. Pumps PW2 and PW3 are located approximately 87 feet and 134 feet below the ground surface, respectively, and are used to pump AMD from the No. 8 Mine workings to grit chambers located at the ground surface. Ten-inch-diameter HDPE piping extends from the grit chambers approximately 150 feet where the pipe transitions to 18-inch-diameter pipe. From that location, the pipeline continues approximately 1,700 feet to just downstream of SCRR where SCRR flow joins the Old/No, 8 pipeline. The pipeline continues approximately 5,200 feet along the Jeep Trail to Iron Mountain Road, travels cross-country approximately 260 feet, and down Iron Mountain Road approximately 3,500 feet to Boulder Creek crossing. There it connects with the 24-inch AMD pipeline described in paragraph (b) above. The pipeline is buried inside a PVC liner that serves as a leak detection system.

3. The Richmond and Lawson mine workings collection and conveyance systems currently include the O&M Unit Components listed below:

   a. For the Richmond Mine workings, there is a Dynastone sump and a timber check dam located at the 5-way, approximately 1,400 feet from the Richmond portal. The Richmond Portal is constructed with a Dynastone ramp that serves as a check dam. There is a floor drain for AMD near the portal at the base of the ramp.

   b. For the Richmond Mine workings, there are three AMD intake structures located in drifts A, B, and C behind AMD dams (intake structures are located approximately 120, 210, and 325 feet from the 5-way, respectively). The drift A and drift C AMD dams are timber construction, and the drift B AMD dam is stainless steel. There are also four additional intake structures located in the 5-way area within 10 to 40 feet from the 5-way sump. These intake structures consist of stainless steel cages with screens and are piped to the sump at the 5-way.

   c. For the Lawson Mine workings, two earthen check dams located approximately 100 feet and 550 feet from the Lawson portal.

   d. AMD intake structures located upstream of the check dams in the Lawson adit. The intake structures consist of stainless steel cages with screens attached to HDPE piping. There is also a pump behind the dam located 550 feet from the portal. This pump is piped to the surface through a vertical borehole that was drill from the surface.

   e. Telemetry systems for transmitting AMD flow rates from the Richmond portal and the Lawson portal to the MFTP.

   f. HDPE piping and miscellaneous parts connecting the intake structures and the grit chambers.

   g. Grit chambers, including liner and structure, inlet and outlet flanges, valves, connecting piping, flowmeters, protective barriers, outlet structures, screens, and miscellaneous parts and equipment.

   h. AMD conveyance pipe system, including HDPE piping, connections, bypass risers, relief valves, control valves, portable emergency piping, and leak detection systems.

   i. Emergency HDPE piping (three 8-inch lines), valves, connections, and supports from the Richmond portal to the emergency bypass connection near the Lawson portal.

   j. Hillslope above buried pipeline from the Richmond Mill buildings to the bottom of the hill near Boulder Creek.

4. The Old/No. 8 Mine workings collection and conveyance systems currently include the O&M Unit Components listed below:

   a. Pump Systems PW2 and PW3, all piping, flow and depth meters, electrical and control systems, telemetry system, storage container, and access roads;

b. Grit chambers, including liner and structure, inlet and outlet flanges, valves, connecting piping, protective barriers, access road, outlet structures, screens, and miscellaneous equipment;

c. AMD conveyance pipe system, including HDPE piping, connections, bypass risers, relief valves, control valves, and leak detection systems;

d. Telemetry systems for transmitting AMD flow rates from the Old/No. 8 Mine workings and SCRR to the MFTP; and

e. Pipe erosion ports and scaling observation ports.

9.6.2 Routine O&M Requirements for AMD Collection and Conveyance Systems

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the AMD collection and conveyance systems to collect and convey the Designated Contaminant Discharges to the MFTP for treatment, to achieve the Performance Standards and other requirements of this SOW. The Site Operator shall operate and maintain all O&M Unit Components, all structures and equipment supporting the O&M Unit Components, and all required improvements to those systems over time.

2. The Site Operator shall maintain a minimum 90 percent flow capacity in all conveyance piping. The Site Operator shall conduct annual inspections of the AMD piping and shall certify the pipe capacity.

3. The Site Operator shall maintain the pipe bridge at Boulder Creek located at the bottom of the hill near the Lawson portal to ensure reliable conveyance of Designated Contaminant Discharges from the Richmond and Lawson mine workings.

4. The Site Operator shall maintain (for selective treatment of Old/No. 8 Mine AMD flow to provide operational flexibility and backup) Pump Systems PW2 and PW3, the grit chamber, electrical control systems, piping, and all other miscellaneous equipment.

5. The Site Operator shall maintain, repair, and replace, as required, the 2,000 feet of portable, emergency AMD conveyance pipelines and additional emergency systems as needed. The Site Operator shall conduct practice exercises every 2 years to ensure that all operators are familiar with the use of the emergency pipeline.

9.6.3 Non-routine O&M Requirements for AMD Collection and Conveyance Systems

1. The Site Operator shall conduct Non-routine O&M of the AMD Collection and Conveyance System to ensure collection and conveyance for treatment of all Designated Contaminant Discharges and to achieve the Performance Standards and other requirements of this SOW.

2. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the grit chambers at the Richmond, Lawson, and Old/No. 8 Mine workings.

3. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the AMD pipeline. The Site Operator is hereby notified that scale buildup occurred in significant portions of the AMD conveyance pipeline from the Old/No. 8 Mine workings

to the Boulder Creek Crossing over the period from 1994 to 2000. The former site operator cleaned the pipeline in summer 1999 and had scheduled completion of de-scaling efforts for the summer of 2000 prior to commencement of this contract. At a minimum, the Site Operator shall conduct annual visual/video inspections of the AMD pipeline at the previously installed scale observation ports to determine the amount of scale buildup and shall remove the scale buildup if the pipeline capacity does not achieve the Performance Standards.

9.7 Brick Flat Pit

9.7.1 Unit Description

1. The purpose of the Brick Flat Pit (BFP) landfill is to store HDS sludge produced at the MFTP. No other materials are allowed to be stored within the BFP landfill without written authorization of the Oversight Agency. EPA has approved disposal of grit from the lime slakers in the BFP.

2. Pursuant to ROD1, in 1988 and 1989 EPA capped the Brick Flat Pit open pit mine to reduce surface- and groundwater infiltration into the Richmond Mine workings and reduce the quantity of water available for generation of AMD. The construction included grading the bottom portion of the open pit to drain, placement of a membrane liner over the bottom of the pit, placement of a soil cover, and construction of surface water interception ditches that conveyed stormwater out of the pit. The construction is described in the document *Operation & Maintenance Manual, Partial Cap Above the Richmond Mine, Iron Mountain Mine, Redding, California* (EPA, November 1989).

3. Pursuant to ROD2 and ROD3, SMC constructed a sludge containment dam and a sludge dewatering lining system in Brick Flat Pit in 1993 and 1994, enabling operation of the pit as a landfill disposal site for sludge generated by the MFTP. The 1988/1989 membrane lining system was left in place under the new sludge dewatering lining system.

4. The Brick Flat Pit Containment Dam is a jurisdictional dam (State of California Application Number 4224), regulated by the Department of Water Resources, Division of Safety of Dams (DSOD). DSOD issued the Certificate of Approval for use of the BFP Containment Dam on December 21, 1994.

5. The position of Rhone-Poulenc with respect to the conditions in BFP as of April 1998 is set forth in the *Brick Flat Pit Baseline Status Report* (Prepared by Morrison Knudsen for Stauffer Management Company, April 1998).

6. The containment dam is planned to be constructed in three phases. The Stage I dam was completed in September 1994. The Stage I dam was approximately 50 feet high, with a crest elevation at 3,200 feet, a spillway crest elevation at 3,195 feet, and a design maximum sludge elevation of 3,190 feet. The total estimated sludge storage capacity for the Stage I dam equaled 271,000 cubic yards. The Stage II dam was completed in May 2003. The Stage II dam has a crest elevation of 3,250 feet, a spillway crest elevation of 3,245 feet, and a design maximum sludge elevation of 3,241 feet. The total estimated sludge storage capacity for the Stage II dam equals 925,800 cubic yards. The Stage III dam has a planned crest elevation of 3,300 feet, spillway crest elevation at 3,295 feet,

design maximum sludge elevation at 3,292 feet, and maximum sludge capacity of 2,575,500 cubic yards.

7. The maximum sludge elevation is designed to minimize the possibility that suspended solids, heavy metals, or other contaminants could be spilled during a one hundred (100)-year, twenty-four (24)-hour storm. The *Iron Mountain Mine 2012 Landfill Management Report and Plan*, included by reference as Attachment F, reports that the available volume between the existing sludge surface and the spillway crest is greater than the minimum required capacity to accommodate the design storm of 43.14 acre-feet.

8. Under the current plan, the dam will be expanded again in one additional stage to the ultimate height of approximately 150 feet, with the final crest elevation at 3,300 feet. DSOD has approved the plans and specifications for construction of the Stage III dam.

9.7.2 Routine O&M Requirements for Brick Flat Pit

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the BFP landfill and all of its O&M Unit Components in a manner that achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall manage BFP in accordance with the existing LMRP and, following approval, the revised LMRP and any subsequent amendments.

3. The Site Operator shall dispose of the HDS treatment sludge in BFP in a manner consistent with a dry landfill operation. Dry landfill operation generally includes the following operational components:

   a. The Site Operator shall raise the sludge landfill from the base of BFP and expand the landfill upward in progressive lifts extending across the landfill footprint. The Site Operator shall spread and compact the HDS sludge in maximum 12-inch loose lifts and compacted it by track-walking with a minimum of four passes with a CAT D6 bulldozer or equivalent. If requested by the Oversight Agency, compaction testing will be performed by the Site Operator by using ASTM D 698. At or near the conclusion of sludge hauls, the Site Operator shall conduct nuclear gage testing at a minimum of 10 locations to provide a record of sludge density during placement. The Site Operator shall report results of the nuclear gage testing in the annual Landfill Management Report and Plan.

   b. To the extent that sand is excavated from the sludge drying beds, the sand should be placed as a cover or near the filtrate riser pipes, to promote drainage.

   c. The Site Operator shall grade the final sludge surface at the end of each sludge haulage to drain toward the filtrate riser pipes, at a slope less than 5 percent.

   d. The Site Operator shall cover all pyrite surfaces with a reinforced shotcrete liner, in conformance with the approved plans and specifications pertaining to the design drawings *Iron Mountain Mine Brick Flat Pit Sulfide Capping, Construction Drawings, Iron Mountain Mine, Shasta County, Redding, California* (SMC, December 1994), or an equivalent suitable barrier. The technical specifications for this sulfide capping are dated November 1994.

4. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the O&M Unit Components within and adjacent to the BFP area in a manner that ensures reliable performance of the IMM Remedy and in a manner that achieves the Performance Standards and the other requirements of this SOW. The O&M Unit Components include, but are not limited to, the BFP Containment Dam, the BFP lining system, the shotcrete-capped sulfide outcrops, the filtrate and acid seep collection and conveyance systems and piping, drop structures and accessway, containment dam spillway, sampling locations and equipment, the filtrate riser pipes, the capped subsidence areas, drainage ditches, drainage control structures, and roadways.

5. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade clean-water diversion drainage ditches and structures to ensure collection of the 100-year peak flow, as designated in the report *Iron Mountain Mine Slickrock Creek Retention Reservoir Water Diversions Hydrology/Hydraulic Report, Revision B* (SMC, June 2000), from designated drainage areas and divert this flow out of BFP and the SCRR catchment area as shown in the SCRR As-Built drawings dated September 2004.

6. The Oversight Agency will collect water quality data from Areas F, G2, H, P3, and I. If these data indicate that flows from some or all of these areas require treatment, the Oversight Agency will select those areas for collection and treatment. If the Oversight Agency selects treatment of Areas F, G2, H, P3, and/or I, the Site Operator shall complete the Work, including but not limited to, minor changes to the drainage ditches and structures that will be required, and that will not be a change in this SOW or entitle the Site Operator to additional compensation.

7. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade contaminated water drainage ditches and structures to collect the 100-year peak flow as designated in the report *Iron Mountain Mine Slickrock Creek Retention Reservoir Water Diversions Hydrology/Hydraulic Report, Revision B* (SMC, June 2000), from designated drainage areas and convey this flow into the SCRR catchment area as shown in the SCRR As-Built drawings.

8. The draft SCRR O&M Plan was drafted by the Oversight Agency in June 2004 in conjunction with construction of the SCRR and related facilities. The Site Operator was given a sufficient chance to review this plan and submit comments for resolution prior to completion of this plan. The Work necessary to carry out the draft SCRR O&M Plan shall be considered to be within the original scope of this SOW and shall not entitle the Site Operator to additional compensation. The general parameters of the SCRR O&M Plan are contained in Attachment B to EPA Order 97-16.

9.7.3 Non-routine O&M Requirements for Brick Flat Pit

1. Construction of the BFP Stage II dam was completed as presented in the May 29, 2003, Shaw Environmental, Inc., *Final As-Built Report for the Phase II Construction of Brick Flat Pit Dam* and in the Iron Mountain Operations *2003 Landfill Management Report and Plan*, dated January 30, 2004. The Oversight Agency approved as-built documentation of the BFP Stage II activities on September 27, 2003.

2. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the filtrate collection system and the acid seep collection system, including pipes, inspection

and sampling ports, drop structures, and filtrate riser pipes. The filtrate riser pipes will be extended each year in a manner consistent with the design drawing *As-Built Revised Vertical Drain, Brick Flat Pit Baseline Status Report Reconfigured Vertical Filtrate Drain with Extensions,* Figure 12 in *Iron Mountain Mine Brick Flat Pit Baseline Status Report* (SMC, April 1998). Notwithstanding the foregoing, the requirements for Non-Routine O&M of the filtrate collection system and the acid seep collection system will be modified based on the Oversight Agency-approved recommendations included in the final BFP landfill study that is currently being conducted by the Site Operator and is to be completed in 2013.

3. Facilities do not currently exist for disposal of ASM sludge or wet HDS sludge at the Site. In exceptional circumstances, ASM sludge or wet HDS sludge may be temporarily stored in Brick Flat Pit, but only with the written approval of the Oversight Agency, and only if the sludge is later processed in a manner that allows the sludge to be placed as an engineered fill. Exceptional circumstances could include (a) wet winter sludge haulage of HDS sludge required due to exceedance of the sludge drying bed capacity, and (b) extended operation of the MFTP in the ASM mode resulting in exceedance of the sludge drying bed capacity. Placing ASM sludge or wet HDS sludge in BFP as an engineered fill is expected to require, at a minimum, the following steps:

   a. The Site Operator shall submit a written plan to the Oversight Agency specific to the existing requirements for sludge placement, the existing Site conditions, and the existing conditions of the BFP landfill.

   b. If placed during the winter months, the ASM sludge or wet HDS sludge shall be placed and segregated within Brick Flat Pit in a manner consistent with the approved plan. The Site Operator shall construct a dump station to prevent damage to the O&M Unit Components. Sludge shall not be dumped on or within 100 feet of liners, the filtrate riser pipes, or the Containment Dam. The segregated area shall be diked with native soils or with HDS sludge to form a temporary containment area. Wet or semiliquid sludge would be dumped in this area until it could be processed. The dikes would need to be maintained and water in the area controlled and discharged through the filtrate riser pipes. A sump area or similar provisions would be constructed to prevent the release of sludge and sediment.

   c. The following summer, the Site Operator shall re-excavate, dry, and rework the sludge to enable the sludge to dry and to be placed as an engineered fill by the end of the summer.

   d. The Site Operator shall conduct compaction testing on the ASM sludge or the wet HDS sludge, in accordance with ASTM D 698, to determine the optimum moisture content and maximum dry density. The Site Operator shall conduct a minimum of one compaction test for determining maximum dry density and optimum moisture content per 5,000 cubic yards of ASM sludge.

   e. The Site Operator shall dry the sludge by use of windrows, tilling, disking, gravity draining, sun drying, or other methods to enable compaction of the sludge.

f. The Site Operator shall spread and compact the wet sludge in maximum 12-inch loose lifts to a minimum 90 percent relative compaction in accordance with ASTM D698. ASM sludge shall not be placed within 50 feet of the filtrate riser pipes.

g. The Site Operator shall provide location coordinates, thickness, elevation, and volume estimates of ASM sludge placement in the following year's LMRP.

9.8 Subsidence Areas

9.8.1 Unit Description

1. EPA capped subsidence zones, cracked ground, and caved areas located just east of Brick Flat Pit during the 1988 and 1989 construction seasons to reduce surface- and groundwater infiltration into the Richmond Mine workings and reduce the quantity of water available for generation of AMD. The construction included placement of inverted filters, processed fill, low permeable soil, a membrane cover, a protective geotextile, settlement monuments, and a riprap cover. The construction is shown in the document *Operation & Maintenance Manual, Partial Cap Above the Richmond Mine, Iron Mountain Mine, Redding, California* (EPA, November 1989).

2. SMC conducted maintenance of the subsidence area in 1995. This maintenance included capping additional subsidence zones, recapping existing subsidence zone caps that had settled since the original construction in 1988 and 1989, installation of settlement monuments, construction of ditch liners and drainage structures, and placement of bentonite chips and shotcrete covers over cracked ground areas. The Record Drawings for the construction are presented in the document *Iron Mountain Mine Brick Flat Pit Surface Water Diversion Construction Drawings, Iron Mountain Mine Site, Shasta County, Redding, California* (SMC, September 1995). The technical specifications used for the construction are dated November 1994.

9.8.2 Routine O&M Requirements for Subsidence Areas

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade subsidence areas in conformance with the document *Operation & Maintenance Manual, Partial Cap Above the Richmond Mine, Iron Mountain Mine, Redding, California,* November 1989 and in a manner that achieves the Performance Standards and other requirements of this SOW.

2. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the surface-water drainage ditches and structures, subsidence zones, and cracked ground areas shown in the document *Iron Mountain Mine Brick Flat Pit Surface Water Diversion Construction Drawings, Iron Mountain Mine Site, Shasta County, Redding, California* (SMC, September 1995) and in a manner that achieves the Performance Standards and other requirements of this SOW. This area is subject to intense rainfall and heavy snowfall, and the Site Operator should plan on significant maintenance of these areas over time.

3. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the, caps, steam vents, roadways, drainage structures, and other equipment and earthworks and in a manner that achieves the Performance Standards and other requirements of this SOW. The Site Operator shall, at a frequency sufficient to ensure a minimum 90 percent capacity of the drainage system, remove debris from drainage ditches and

drainage drop structures. The Site Operator shall repair and regrade subsidence zones to maintain drainage away from the subsidence zones, repair or replace the lining systems, and repair or replace shotcrete infiltration barriers, as required, to minimize infiltration into the subsidence zones, consistent with the original design intent.

4. The Site Operator shall inspect the subsidence areas to discover any changes in the appearance of the caps, steam vents, roadways, or drainage structures. During dry periods, the Site Operator shall perform these inspections every other month. During wetter periods, the Site Operator shall perform these inspections monthly. If the features change, the Site Operator shall perform these inspections on a more frequent basis on a schedule approved by the Oversight Agency. The Site Operator shall maintain access to the subsidence areas for these inspections.

5. The Site Operator shall prepare a field inspection report within 1 week of an inspection. The report will note the condition of the caps, roads, and drainage structures, and note steps taken to correct deficient conditions, repair, or maintain the facilities. The Site Operator shall expeditiously perform the needed repairs. The inspection reports shall be submitted with the Monthly Progress Reports.

9.8.3 Non-routine O&M Requirements for Subsidence Areas

1. The Site Operator shall have annual surveys of the subsidence areas conducted by a licensed surveyor.

2. The Site Operator shall survey the subsidence areas more frequently if it observes changes in the appearance of the caps, steam vents, roadways, or drainage structures or if the survey data indicate an increase in the rate of settlement. Increased inspections will not be required to the extent that the Site Operator corrects the conditions that trigger the need for the increased inspections.

3. The Site Operator shall include the survey results in the Annual Operations Work Plan.

4. If new subsidence areas form, the Site Operator shall design and construct additional caps, following RD and RA SOW requirements.

9.9 Mine Workings

9.9.1 Unit Description

1. The major mine workings at the Site include the Richmond and the Hornet mines in the Boulder Creek Basin and the Old/No. 8 Mine workings in the Slickrock Creek Basin. Other orebodies that have been mined include the Brick Flat Pit orebody, the Mattie, and the Confidence Complex. The IMM Remedy requires the Site Operator to collect and treat AMD discharges from the Richmond, Lawson, and Old/No. 8 Mine workings and contaminated flows from Slickrock Creek.

2. Iron Mountain was the object of intense mining activity from about 1895 through 1962. This activity included massive excavations, open pit mining, blasting, tunneling tens of thousands of feet, creation of large underground openings, and dumping thousands of acre-feet of waste rock. Many of the portals, tunnels, and underground openings have collapsed, further opening fractures in the country rock and orebodies, and causing large surface subsidence features to form.

3. Numerous investigations have reported on the history of the mine workings and the condition of the Site. These include the *Final Remedial Investigation Report* (EPA, August 1985); *Boulder Creek Remedial Investigation Report* (EPA, May 1992); the *Remedial Investigation and Feasibility Study Old/ No. 8 Mine Seep Operable Unit* (EPA, December 1992); the *Water Management Feasibility Study* (EPA, June 1994); the *Water Management Feasibility Study Addendum* (EPA, May 1996); and the *Settlement Risk Analysis* (EPA, March 2000). The Site Operator is referred to these documents for information regarding the condition of the mine workings and additional references.

4. The Richmond portal, adit, 5-way and drifts in the Richmond Mine were modified by the Site Operator as documented in the *Richmond Adit and Drifts Rehabilitation As Built Report* (North Pacific Research, October 2004).

9.9.2 Routine O&M Requirements for Mine Workings

1. The Site Operator shall collect and convey for treatment all Designated Contaminant Discharges.

2. The Site Operator shall provide safe access to the Oversight Agency, the Support Agency, and its representatives to the maintained areas of the mine workings.

9.9.2.1 Routine O&M Requirements for the Richmond Adit

1. The Site Operator shall inspect and maintain the Richmond Adit and portions of the drifts that are identified in Paragraphs 2 and 3 of this Section 9.9.2.1 in a manner that ensures reliable, long-term performance of the adit and drifts, and reliably achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall inspect and maintain the Richmond Adit from the portal to the 5-way, approximately 1,300 feet from the portal. The Site Operator shall inspect, maintain and operate the Richmond Adit, the 5-way, and drifts in a manner that ensures near-continuous, safe entry into the Richmond Adit from the portal to the 5-way, into the A Drift (for approximately 130 feet from the 5-way), into the B Drift (for approximately 225 feet from the 5-way), into the C Drift (for approximately 340 feet from the 5-way), into the D Drift (for approximately 65 feet from the 5-way), into the 5-way bypass drift connecting the Richmond Adit to the C Drift, and into the cross-cut connecting the B Drift and the C Drift (at approximately 150 feet and 160 feet from the 5-way, respectively).

3. Maintain facilities constructed during the Richmond Adit and Drifts Rehabilitation, including the chute plugs, muck dams, and AMD collection and conveyance facilities. The Site Operator shall develop a plan to address the chute plugs by December 2013 and the resolution agreed upon in the final Chute Plug Plan will be implemented.

4. The Site Operator shall remove muck from the maintained areas, as necessary, to ensure the collection of all Designated Contaminant Discharges. At a minimum, muck shall be removed from the drifts annually if more than 30 cubic yards of muck has accumulated in the designated maintenance areas. The Site Operator shall place the muck in the Oversight Agency-approved muck disposal cell.

5. As part of the O&M Plan, the Site Operator shall establish a plan to inspect, maintain, and operate all utilities, including lights, electrical, generator, air, AMD conveyance, and clean-water systems that are located within and adjacent to the Richmond Adit.

6. After all large storm events and after unusual changes in AMD discharge from the Adit, i.e., unusual changes in flow rate, chemistry or appearance, the Site Operator shall inspect and maintain, as necessary, the Richmond Adit, AMD collection locations in the 5-way, and AMD collection locations in the A, B, and C Drifts.

9.9.2.2 Non-routine O&M Requirements for the Richmond Adit

1. The Richmond Adit and Drifts Rehabilitation was completed in September 2003, as described in the *Richmond Adit and Drifts Rehabilitation As Built Report* (North Pacific Research, October 2004).

6. The conditions in and around the Richmond Mine, Richmond Adit, and Richmond Drifts is uncertain. The Site Operator assumes the risk of adverse conditions and shall not be entitled to additional compensation should adverse conditions be encountered during construction.

7. The Site Operator shall retain a qualified engineer with expertise in mining to conduct annual, detailed inspections of the Richmond adit to the limit of the improvements made as described in Section 9.9.2.1(2).

8. The Site Operator is hereby notified that the condition and stability of the adit and drifts is not known. The Site Operator shall be responsible for the safety of the Site Operator's employees, subcontractors, and others entering the adit and drifts by authority of the Site Operator.

9. The qualified engineer shall note changes in the amount of muck that has accumulated in the 5-way and the drifts, shall note observations regarding the stability of the adit and the drifts, and shall provide a notice. The notice shall include the following elements: any conditions that affect the muck removal, the volume of muck to be removed, which areas have muck removal, the anticipated disposal site, and the schedule for commencing and completing the work. The notice shall be provided to the Oversight Agency at least fifteen (15) working days prior to the action to remove accumulated muck from the adit, the 5-way, and the drifts, if necessary.

10. The Site Operator shall remove the muck from the mine workings as often as required, to ensure the collection of Designated Contaminant Discharges. The Site Operator shall place the muck in the Oversight Agency-approved sludge disposal cell. The Site Operator designed the disposal cell in conformance with the mining regulations. The muck storage location was designed as an RD/RA work activity.

11. In addition to the annual surveys, the Site Operator shall inspect the adit after all large storm events and after unusual changes in AMD discharge from the adit; i.e., flow rate, chemistry, or appearance. This inspection will be by regular work forces of the Site Operator and will not necessarily require the involvement of an engineer.

12. The qualified engineer with expertise in mining shall carefully note changes in the physical condition of the country rock, and liner plates.

13. Following each annual inspection, the qualified engineer with expertise in mining shall prepare a letter report documenting the inspection, the condition of the mine, and recommended repairs and maintenance. The qualified engineer with expertise in mining shall work under the direction of a registered engineer, who shall stamp and sign the annual inspection report. The Site Operator shall submit the report to the Oversight Agency and Support Agency as part of the normal monthly report.

14. For maintenance projects that, in the aggregate, exceed $100,000 (adjusted by the Inflation Escalator), the qualified engineer with expertise in mining shall oversee the design.

9.9.2.3 Routine O&M Requirements for the Lawson Adit

1. The Site Operator shall maintain the Lawson adit in a manner that achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall maintain the Lawson adit from the portal to approximately 550 feet from the portal.

3. The Site Operator shall perform routine maintenance, as necessary, for all utilities, including lights, electrical, generator, air, AMD conveyance, and clean water systems that are located within and adjacent to the Lawson adit. The Site Operator may rely on temporary systems where continuous access is not necessary or where a permanent system is not necessary to ensure continuous collection and conveyance of AMD from the Lawson portal. Some examples of temporary systems that currently do not require ongoing maintenance at the Lawson Adit include lighting systems and air supply systems that are subject to corrosive action in areas of the mine that do not require constant entry.

4. The Site Operator shall inspect the adit after all large storm events and after unusual changes in AMD discharge from the adit; i.e., unusual changes in flow rate, chemistry, or appearance. This inspection will be by regular work forces of the Site Operator and will not necessarily require the involvement of an engineer.

9.9.2.4 Non-routine O&M Requirements for the Lawson Adit

1. The Site Operator shall remove the muck from the portal to approximately Station 5+50, and from the associated stilling pool, as necessary, to ensure the collection of Designated Contaminant Discharges. The Site Operator shall place the muck in an Oversight Agency-approved sludge disposal cell.

2. The Site Operator shall retain a qualified engineer with mining experience to conduct yearly, detailed inspections of the adit from the portal to approximately Station 5+50.

3. The Site Operator shall retain a licensed surveyor to monitor critical adit components on an annual basis. The survey shall be conducted under the direction of the qualified engineer with mining experience.

4. With proper O&M, the Lawson adit timber support system has an expected useful life of 5 to 15 years (2005 to 2015), but may require replacement sooner if adverse conditions occur. The Site Operator shall test steel sets, liner plates, timber lagging, and timber supports, as needed to ensure reliable operation of the mine workings and collection

systems and to provide safe access for inspections and maintenance. The Site Operator shall rely on a qualified engineer with mining experience to test the supports and other equipment and to make recommendations for repair or replacement. The Site Operator shall replace support structures as recommended by the qualified engineer with mining experience.

5. Following each annual inspection, the qualified engineer with expertise in mining shall prepare a letter report documenting the inspection, the condition of the mine, and recommended repairs and maintenance. The qualified engineer with expertise in mining shall work under the direction of a registered engineer, who shall stamp and sign the annual inspection report. The Site Operator shall submit the report to the Oversight Agency and Support Agency as part of the normal monthly report.

6. For maintenance projects that, in the aggregate, exceed $100,000 (adjusted by the Inflation Escalator), a qualified engineer with mining experience shall oversee the design.

9.9.2.5 Routine O&M Requirements for the Old/No. 8 Mine Workings

1. The Site Operator shall inspect, and, as necessary, operate, maintain and repair/upgrade the pump system wells PW2 and PW3 for selective treatment of AMD inflow into the SCRR. The Site Operator shall maintain all components of the systems, including pumps, pipes, electrical, valves, miscellaneous equipment components, and the downhole pumping locations.

2. Maintaining as necessary the downhole pumping locations includes, but is not limited to, removing the existing pumps, placing sludge pumps within the wells, and pumping solids out of the wells.

9.10 Clean Water Diversions

9.10.1 Unit Description

1. Clean water diversions (CWDs) have been designed and constructed at Iron Mountain to divert relatively clean water around areas contaminated by discharges from the mine workings, acid seeps, and mineralized waste rock.

2. The CWDs include the Upper Spring Creek Diversion, the ROD1 Slickrock Creek Clean Water Diversion, the ROD4 Slickrock Creek Clean Water Diversion, and Left-Side Water Diversions.

9.10.2 Upper Spring Creek Diversion

9.10.2.1 Unit Description

1. The Upper Spring Creek Diversion diverts relatively uncontaminated water from Upper Spring Creek into Flat Creek. The tributary Upper Spring Creek watershed has an area of about 4,000 acres, which makes up approximately 40 percent of the Spring Creek watershed. The purpose of the diversion is to reduce the volume of flow into Spring Creek Reservoir, effectively making the reservoir larger and enabling managed control of the contaminated flow from Iron Mountain Mine into the Sacramento River. The capacity of the diversion equals approximately 850 cfs.

2. The diversion was constructed in 1990/91 with startup on January 22, 1991. O&M Unit Components include, but are not limited to, an intake drop structure, approximately 425 feet of tunnel, 1,200 feet of reinforced concrete pipe (RCCP), and an impact/outlet structure. The intake drop structure, located in Spring Creek, is approximately 150 feet long (across the creek), 30 feet deep, and 30 feet wide. The intake drop structure functions as a sedimentation basin and is covered by a removable trashrack. The tunnel has an arch-type cross section, approximately 96 inches wide by 96 inches high, and was constructed with cast-in-place, reinforced concrete. The pipe is currently unlined.

3. The tunnel transitions into a 54-inch-diameter pipe, which was constructed of low-head, reinforced concrete pressure pipe lined with an elastomeric urethane material. Portions of the urethane lining protecting the pipe have eroded, particularly at the pipe joints. Some erosion of the concrete has also occurred at the joints, exposing the reinforcing steel. SMC has conducted repair trials but has been unsuccessful in identifying an economical approach for repairing the lining system.

4. The sediment load has also damaged the impact structure concrete wall nearest the discharge end of the pipeline. On three occasions, SMC has attempted to place a protective covering over the concrete, but this covering has eroded during elevated stormflow events. The erosion rate of the concrete wall is relatively low.

5. SMC excavated a small stilling basin upstream of the drop structure in Spring Creek to promote settling of sediment and debris. The intensity of storm runoff events since this construction has been too low to demonstrate whether the excavation will reduce the solids burden sufficiently to reduce erosion of the lining and the impact structure.

6. The O&M Unit Components of the Upper Spring Creek Diversion include, but are not limited to the following:

   a. The Spring Creek stream channel upstream of the diversion drop structure;
   b. The drop structure;
   c. Minimum flow bypass to the creek;
   d. Spring Creek channel stilling basin;
   e. The tunnel;
   f. The pipeline;
   g. The impact structure; and
   h. The stream channel downstream of the impact structure.

9.10.2.2 Routine O&M Requirements for the Upper Spring Creek Diversion

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the Upper Spring Creek Diversion and all of its O&M Unit Components in a manner that ensures the continued diversion of design flows and the achievement of the Performance Standards and other requirements of this SOW.

2. The Site Operator shall maintain and operate the Upper Spring Creek Diversion in conformance with the document *Upper Spring Creek Diversion, Operation and Maintenance* (ICI Americas, August 1992), and any modifications or updates to this document.

3. The Site Operator shall coordinate with the Oversight Agency prior to all shutdowns of the Upper Spring Creek Diversion, including downtimes required for maintenance or emergencies.

4. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the impact structure, drainage controls, and the streambed supporting the impact structure.

5. During elevated flow conditions, the Site Operator shall (a) perform inspections prior to, during, and after periods of elevated flow, and (b) monitor the wear of the impact structure wall for erosion on a monthly basis. The Site Operator shall take appropriate action to repair or correct issues noted during these inspections. The Site Operator shall include a discussion of the monitoring in the Annual Operations Work Plan.

6. The Site Operator shall maintain the stilling basin located upstream of the Upper Spring Creek Diversion intake drop structure to allow and promote settling of fine and coarse gravel, prevent gravel from dropping into the intake structure, and prevent gravel from being transported and eroding the diversion pipeline and impact structure.

7. The Site Operator shall monitor the streambed downstream of the impact structure for erosion of the bed and supporting walls. If erosion is observed, the supporting walls or the streambed may require reinforcement. The Site Operator shall include a discussion of the monitoring in the Annual Operations Work Plan and, if necessary, perform RD and RA to repair the facility, based on the cost of the repair, replacement, or upgrade.

9.10.2.3 Non-routine O&M Requirements for the Upper Spring Creek Diversion

1. The stilling basin upstream of the drop structure is small compared to the expected streamflow and sediment load during elevated storm events. In 2003 the Site Operator enlarged the stilling basin. The Site Operator will remove sediment from the stilling basin as needed to maintain sediment retention capacity when established periodic monitoring indicates that ½ of the basin capacity has been depleted. The sediment shall be removed from the stilling basin at least annually prior to the start of the wet season.

2. The Site Operator shall conduct inspections of the tunnel and the RCCP annually, or more frequently if required. If the annual inspections indicate rapid or excessive deterioration of the lining system, the Site Operator shall perform the inspections more frequently.

3. In the Proposed Scope of Work and Contract Award for *Spring Creek Diversion RCCP Pipe Inspection and Repair Project* (IMO, 2003a, 2003b), the Site Operator proposed and has implemented a pipeline inspection and repair program. The program includes annual inspection of the pipeline, preparation of a pipeline inspection report for review by the Oversight Agency, evaluating and selecting the appropriate pipeline repair methods and materials, and implementing the repairs with appropriate quality assurance and quality control inspection and documentation (IMO, 2003b). The Site Operator shall develop a plan for evaluating the refurbishment and long-term maintenance of the liner system by December 2013. The Site Operator shall prepare an annual written report and perform RD and RA to complete the required structural repair of the facility.

4. The impact structure was covered with stainless steel during the 2004 annual Upper Spring Creek Diversion inspection. The facility shall be maintained to ensure the long-term performance of the impact wall.

5. The Site Operator shall maintain the hillslope above the Upper Spring Creek Clean Water Diversion drop structure free of excessive brush. The thick brush presents a fire hazard to the piping that provides clean water used for lime makeup and other operations at the treatment plant.

9.10.3 ROD1 Upper Slickrock Creek Diversion

9.10.3.1 Unit Description

1. The ROD1 Slickrock Creek CWD diverts relatively uncontaminated water from Upper Slickrock Creek around the Slickrock Creek Basin. The tributary Upper Slickrock Creek watershed has an area of about 274 acres, which makes up approximately 2 percent of the Slickrock Creek watershed. The purpose of the diversion is to divert relatively clean water around the landslide area, thereby reducing contamination of the cleaner water through infiltration into the Old/No. 8 Mine workings and contact with mineralized waste rock. The diversion was designed and constructed by the USBR in 1990. The capacity of the pipeline is approximately 70 cfs.

2. The ROD1 Upper Slickrock Creek Diversion is described in the document *Spring Creek Watershed Pollution Control Program, Operation and Maintenance Manual Slickrock Creek Diversion* (U.S. Bureau of Reclamation, January 1990).

3. O&M Unit Components include but are not limited to:

   a. A 67-foot-long, 23-foot-high concrete diversion structure including a concrete dam, an intake structure, a trashrack, valve, and miscellaneous parts;

   b. A stilling basin upstream of the diversion structure;

   c. Approximately 4,600 linear feet of lined, buried 36-inch-diameter high pressure pipe; and

   d. A concrete impact basin at the pipe outlet.

4. The Oversight Agency has incorporated the ROD1 Upper Slickrock Creek Diversion into the ROD4 Upper Slickrock Creek CWD and it will continue to be operated for the foreseeable future.

5. In 1995, SMC designed and constructed an inlet structure for collecting drainage from the Catfish Pond area and a CWD channel in the roadway above the USBR CWD pipeline. A pipe inlet and a 24-inch HDPE pipe from the Catfish Pond inlet ties into the existing USBR 36-inch concrete pipeline. Overflow from the USBR diversion structure and local runoff from above Catfish Pond are diverted into the USBR pipeline and into the diversion channel. These modifications to the ROD1 Upper Slickrock Creek Diversion have been incorporated into the ROD4 Upper Slickrock Creek Diversion.

9.10.3.2 Routine O&M Requirements for the ROD1 Upper Slickrock Creek Diversion

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the ROD1 Slickrock Creek Clean Water Diversion and all of its O&M Unit Components in a manner that ensures the continued diversion of design flows and the achievement of the Performance Standards and other requirements of this SOW.

2. The Site Operator shall maintain and operate the diversion in conformance with the document *Spring Creek Watershed Pollution Control Program, Operation and Maintenance Manual Slickrock Creek Diversion* (U.S. Bureau of Reclamation, January 1990), and any modifications or updates to this document.

3. The Site Operator shall, on a regular basis, inspect and remove debris from the trashrack of the pipeline inlet to prevent clogging and overflow of the concrete dam.

4. The Site Operator shall remove sediment from the upstream stilling basin

   a. Annually; and

   b. More often, as required, to maintain capacity for settling sediments from the creek inflow.

5. As required during elevated storm events, the Site Operator shall remove debris from the trashrack and excavate sediments from the stilling pool to prevent overflow of the concrete dam or sediments from entering the pipeline.

9.10.3.3 Non-routine O&M Requirements for the ROD1 Upper Slickrock Creek Diversion

1. The Site Operator shall inspect the RCCP and lining system on an annual basis and make necessary repairs to ensure that the pipeline continues to meet the original design intent of this component of the IMM Remedy in a reliable manner.

9.10.4 ROD4 Upper Slickrock Creek Diversion

9.10.4.1 Unit Description

1. A new CWD was designed and constructed under separate contract pursuant to ROD4 and the construction of the SCRR between 2001 and 2004. The CWD directs flow into the SCRR side channel spillway for routing around the SCRR dam. The proper functioning of the CWDs is essential to reducing flow into the SCRR and meeting Performance Standards.

2. The Slickrock Creek CWD was constructed on the south slope of the basin to convey stormflow from Upper Slickrock Creek and South Fork Mountain around the SCRR catchment area. The diversion consists of approximately 3,800 feet of partially buried RCCP pipe ranging in size from 72 inches to 66 inches inside diameter. The pipe is sized to convey the estimated 100-year stormflow, up to a maximum of about 610 cfs at the SCRR.

3. The O&M Unit Components for the new CWD include, but are not limited to:

a. A concrete intake structure located at the downstream entrance to the Catfish Pond area;

b. A reinforced concrete pipeline partially buried along the alignment of the existing CWD channel;

c. Drop structures and piping to convey drainage from South Fork Mountain into the new pipeline;

d. Drop inlets and piping to convey remaining flow captured by the existing channel into the new pipeline; and

e. A USBR-type impact structure located at the terminus of the CWD.

9.10.4.2 Routine O&M Requirements for the ROD4 Upper Slickrock Creek Diversion

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the ROD4 Slickrock Creek Clean Water Diversion in a manner that ensures the continued diversion of design flows and the achievement of the Performance Standards and other requirements of this SOW.

2. The Site Operator shall, on a regular basis, inspect and remove debris from the trash-rack to prevent clogging and overflow of the intake structure.

3. The Site Operator shall remove the sediment from the upstream stilling basin located in the Catfish Pond area:

   a. On an annual basis; or

   b. More often, as required, to maintain capacity for settling sediments from the surface-water inflows.

4. As required during elevated storm events, the Site Operator shall remove debris from the trashrack and excavate sediments from the stilling pool to prevent overflow of the intake structure or sediments from entering the partially buried concrete conveyance pipeline.

5. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the side drainage inlets to ensure that the surface-water flow from these drainages enters the pipeline and is diverted around the SCRR, consistent with the design intent.

6. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the roadway surface-water containment systems in a manner that ensures that the roadway surface-water flows are diverted around the SCRR, consistent with the design intent.

7. As required during elevated storm events, the Site Operator shall remove debris and sediments from the roadway to allow for vehicle access, performance of inspections, and to prevent overflow of the channel containment system.

9.10.4.3 Non-routine O&M Requirements for the ROD4 Upper Slickrock Creek Diversion

1. The Site Operator shall inspect the intake drop structure, the interior of the partially buried RCCP pipeline, and the impact structure on an annual basis and make necessary repairs to ensure that the diversion achieves the requirements of this SOW and the Performance Standards. The Site Operator shall prepare an annual written report, included as part of a monthly report, to document the condition of the pipeline and diversion, and the implementation of any necessary repairs or upgrades.

2. The Site Operator shall maintain the Catfish Pond area as a sediment stilling basin free of dead trees, brush, and debris that could plug or impair the performance of the clean water diversion intake drop structure. The stilling basin shall not be used for storage of any materials without the written authorization of the Oversight Agency.

9.10.5 Left-Side Clean Water Diversions

9.10.5.1 Unit Description

1. Left-Side Clean Water Diversions were designed and constructed under separate contract pursuant to ROD4 and the construction of the SCRR between 2001 and 2004. The Left-Side Clean Water Diversions (CWDs) consist of roadways, drainage ditches, and culverts designed to convey relatively clean water around the hematite pile and the SCRR catchment area. The proper functioning of the CWDs is essential to reducing flow into the SCRR and meeting Performance Standards.

2. CWDs were constructed on the "left side" of the Slickrock Creek Basin looking downstream from Catfish Pond. The left-side clean water diversion ditches were excavated into existing soils, are unlined, and are subject to erosion and sediment deposition.

3. O&M Unit Components include but are not limited to:

    a. In the BFP area, drainage ditches and structures designed to convey the 100-year peak discharge of relatively clean water from areas designated in Section 9.7.2 into Upper Slickrock Creek and Boulder Creek; and

    b. In the Slickrock Creek Basin, drainage ditches and structures designed to convey the 100-year peak discharge of relatively clean water from areas designated in Section 9.7.2 into Upper and Lower Slickrock Creek.

9.10.5.2 Routine O&M Requirements for the Left-Side Clean Water Diversions

1. In a manner that ensures the continued diversion of design flows and the achievement of the Performance Standards and other requirements of this SOW, the Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the Left-Side Clean Water Diversions.

2. The Site Operator shall inspect and remove debris from the pipeline inlets, pipelines, surface-water control ditches, and other structures in a manner that prevents clogging and loss of control of surface-water flows.

3. The Site Operator shall clean the drainage control structures and ditches

a. Annually to restore normal drainage flow capacity; and

b. At all other times, (including during storm events) to ensure a minimum of approximately 80 percent of full drainage flow capacity at all locations.

4. As required during elevated storm events, the Site Operator shall remove debris from the pipeline inlets, pipelines, surface-water control ditches, and other structures to prevent clogging and loss of control of surface-water flows.

9.10.5.3 Non-routine O&M Requirements for the Left-Side Clean Water Diversions

1. The Site Operator shall inspect the pipeline inlets, pipelines, surface-water control ditches, and other structures on an annual basis and make necessary repairs to ensure that the Left-Side Clean Water Diversions achieve the requirements of this SOW and the Performance Standards.

9.11 Boulder Creek Tailings Dam

9.11.1 Unit Description

1. The Boulder Creek Tailings Dam was built in 1945 to contain tailings produced at the Mattie Mill (now the Richmond Mill buildings). A single engineering drawing of the dam and reservoir exists, prepared by Mountain Copper Company, Ltd., and dated July 11, 1945. The Boulder Creek tailings dam embankment and spillway improvements were completed between December 2003 and October 2004 as described in the *Final Construction Report for Spillway Improvements at Boulder Creek Tailings Area* (TRC, March 2005).

2. The O&M Unit Components include, but are not limited to, the Boulder Creek Tailings Dam, including the spillway, the tailings, the streambed between the tailings dam and the upstream Boulder Creek Crossing at Iron Mountain Road, and the hillslopes between the tailings dam and the upstream Boulder Creek Crossing at Iron Mountain Road.

3. The Boulder Creek Tailings Dam appears to be a homogeneous embankment dam constructed of decomposed granite. Decomposed granite erodes relatively easily under flowing water. The reservoir is full of sediment and tailings. Review of the original drawings of the dam and reservoir indicate a minimum of 25,000 cubic yards of tailings is present upstream of the tailings dam.

4. The dam spillway is an open chute cut into bedrock on the left abutment. The Site Operator increased the spillway capacity as part of this SOW as described in Section 9.11.3.

9.11.2 Routine O&M Requirements for Boulder Creek Tailings Dam

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the O&M Unit Components of the Boulder Creek Tailings Dam in a manner that reliably achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall, on a regular basis, inspect and remove debris from the areas in Boulder Creek upgradient from the inlet to the spillway in a manner that minimizes the risks and prevents clogging and overflow of the tailings dam.

3. During the wet season and during storm events, the Site Operator shall regularly inspect the embankment and spillway of the Boulder Creek Tailings Dam and remove debris as necessary to prevent clogging and overflow of the tailings dam.

9.11.3 Non-routine O&M Requirements for Boulder Creek Tailings Dam

1. The Site Operator modified the Boulder Creek Tailings Dam embankment and spillway to provide a moderate increase in spillway capacity by removing the trashrack and the concrete weir, adding a training wall and riprap protection, and increasing the height of the dam crest. The components of the modifications included the following:

   a. The Site Operator submitted a design based on additional engineering analyses including a detailed Site survey and a rigorous hydraulic analysis.

   b. Raising the west (tailings dam) side of the channel with a gabion training wall, adjacent to the existing spillway.

   c. Placement of riprap slope protection along the west entrance to the spillway adjacent to the tailings dam.

   d. Widening and raising of the dam crest to El. 1845 feet.

   e. Installing a reinforced concrete facing on the downstream side of the existing concrete weir, and filling void space below the weir and behind the facing wall with concrete.

   f. Installing a shotcrete lining on the exposed gabions and west bank channel downstream of the weir.

2. The Site Operator shall inspect the spillway and embankment of the Boulder Creek Tailings Dam on an annual basis and make necessary repairs to ensure that the tailings dam continues to function in a reliable manner to contain the tailings in place and minimize their potential for environmental harm.

3. The Site Operator shall maintain the streambed and the hillslopes upstream of the tailings dam in a manner that minimizes the probability of plugging of the spillway. The Site Operator shall remove dead and downed trees, brush, and debris from the streambed and the hillslopes between the tailings dam and the upstream Iron Mountain Road crossing. This activity shall be performed each year prior to the onset of wet winter weather and during the wet winter weather, as required, to ensure full capacity of the existing streambed and tailings dam spillway.

4. The Site Operator shall make necessary emergency repairs to ensure that the tailings dam continues to function in a reliable manner to contain the tailings in place and minimize the potential for environmental harm.

9.12 Slickrock Creek Basin

9.12.1 Unit Description

1. The Slickrock Creek Basin was mined for its copper and gold deposits from around 1860 though the 1940s. Mining within the basin and dumping of overburden materials

during the Brick Flat Pit open pit mine excavation have heavily disturbed the basin and have left the basin subject to major slope failures and erosion.

2. The Slickrock Creek landslide occupies most of the north slope of the basin. Prior to mining, much of this slope was mantled by an immense mass of gossan or oxidized sulfide. The early mine operations consisted of selective mining of the gossan for gold. Beneath the gossan, the miners found the Old Mine orebody, a large massive sulfide orebody containing high concentrations of copper. Mountain Copper Company mined the Old Mine from about 1896 through about 1907, with a maximum of about 1,000 tons per day excavated from the mine.

3. Mountain Copper Company discovered veins of disseminated pyrite below and adjacent to the Old Mine orebody and excavated these veins, collectively known as the No. 8 Mine, from about 1907 through 1919. The No. 8 Mine workings consisted of three levels of workings, the lowest of which was located some 300 feet below the ground surface. All but two of the many portals have collapsed or have been buried by debris. The Old/No. 8 Mine Seep, an artesian AMD flow, was designated for collection and treatment by EPA in ROD3.

4. Mountain Copper Company mined, milled, and cyanide-leached the gossan from about 1929 through 1942 for gold extraction. The former hematite piles were remnant tailings from this operation.

5. Mountain Copper Company mined Brick Flat Pit by open pit mining, removing over 1,000 acre-feet of overburden, much of which was dumped into the Slickrock Creek Basin. A large portion of the dumped material remains on the north slope of the basin and is marginally stable, subject to significant erosion and movement, particularly during wet winter storm conditions. Two debris-flow or mudflow channels have been scoured to bedrock on the north side of the basin, creating deltaic fans at the bottom of the hillslope. The fans are typically saturated and have very low undrained strength during storm events.

6. The SCRR was constructed just downstream of the former main hematite pile (now the encapsulated hematite pile storage area). The reservoir has a storage capacity of about 220 acre-feet and a height of about 150 feet. The SCRR collects contaminated discharges from a catchment area of about 150 acres for conveyance and treatment at the MFTP. The reservoir is designed to retain and convey for treatment all AMD flow from the catchment area up to a 100-year flow event. The multi-level outlet works have a maximum discharge capacity to the treatment plant of about 4,000 gpm with a design flow rate of 3,250 gpm. The reservoir side-channel spillway is sized to convey approximately 1,481 cfs (at water surface El. 2445.8 feet).

7. A 14-acre-foot sediment basin was constructed upstream of the SCRR under separate contract with the intent of limiting the volume and grain size of materials discharged to the SCRR. There is also a 3-acre-foot dead pool in the SCRR which is intended to settle out smaller particles. The intent of the particle removal for both the sediment basin and the reservoir dead pool is to protect the SCRR intake structures, limit the grain size that will be conveyed in the HDPE conveyance piping, and reduce impacts to equipment at the treatment plant.

8. The Site Operator is hereby notified that the consolidated and capped hematite pile storage area contains tailings that have elevated levels of arsenic and other hazardous substances. There are small pockets of remnant hematite material in both the former upper and lower hematite pile gullies that were not placed into the storage area during SCRR construction.

9. O&M Unit Components in the Slickrock Creek Basin include, but are not limited to, the SCRR, the sedimentation basin, the landslide, the hematite pile, and the left abutment AMD conveyance. The O&M requirements for other facilities within the basin are addressed in other sections of this SOW, including the clean water diversions (Section 9.10), the Old/No. 8 Mine workings (Section 9.9), and the roads (Section 9.5).

10. The O&M Unit Components for the SCRR include, but are not limited to, the dam, spillway, outlet works (including all components of the multi-level intake structure through the AMD conveyance piping downstream of the dam), telemetry and electrical systems, the reservoir (including the dead pool), and the hillslopes immediately adjacent to the reservoir.

11. The O&M Unit Components for the sedimentation basin include, but are not limited to, the embankment, the spillway, the underdrain system, the basin, and the hillslopes adjacent to the basin.

12. The O&M Unit Components for the hematite pile include, but are not limited to, the hematite, the drainage and sediment collection ditches, drainage structures, the underdrain system and discharge piping systems, the toe berm, the hematite check dam, and all other miscellaneous components.

13. The O&M Unit Components for the Left Abutment AMD Conveyance include, but are not limited to, the AMD pipeline, AMD pipeline supports, air vents, valves, drop structure, and energy dissipater.

9.12.2 Routine O&M Requirements for the Slickrock Creek Basin

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade these O&M Unit Components in the Slickrock Basin in a manner that ensures reliable performance of the IMM Remedy, and reliably achieves the Performance Standards and other requirements of this SOW.

2. The Slickrock Creek Dam is under the jurisdiction of the State of California, Department of Water Resources, DSOD. The Site Operator shall operate the dam in compliance with all requirements of DSOD.

3. The Site Operator shall notify the Oversight Agency within eight (8) hours if the reservoir level exceeds 40 acre-feet, if the reservoir level is not decreasing, and if the reservoir level increase is due to emergency conditions, treatment plant downtime, or unplanned maintenance.

4. The facilities required for collection and conveyance of AMD and operation of the Slickrock Creek Retention Reservoir include the Slickrock Creek dam and reservoir; the Slickrock Creek Clean Water Diversion; the Left-side Clean Water Diversions; the sedimentation basin; the hematite pile; roadways; the sediment deposition locations; and all

pumps, pipes, mechanical, and electrical equipment used for storage, conveyance, and monitoring of AMD flows from the SCRR and the Old/No. 8 Mine workings.

5. During the summer and fall and during periods of low flow (less than 300 gpm) from the Slickrock Creek Basin, the Site Operator shall inspect the following items on all Working Days: SCRR facilities, sedimentation basin, and clean water diversions.

6. With the onset of wet winter weather conditions, the Site Operator shall inspect the following items a minimum of twice daily, approximately twelve (12) hours apart: SCRR facilities, sedimentation basin, and clean water diversions.

7. During large storm events (rainfall greater than 4 inches per day, rainfall greater than 6 inches in two (2) days, or rainfall greater than 8 inches in 3 days), the Site Operator shall inspect the following items a minimum of four times per day, approximately six (6) hours apart: SCRR facilities, sedimentation basin, and clean water diversions.

8. The Site Operator shall record results of the noted inspections in an inspection report to be included in the monthly report.

9. For each of these inspection items, the inspection report shall note the status and any observed changes in conditions for the following:

   a. SCRR facilities

      i. Water level in the retention reservoir;
      ii. Discharge rate out of the retention reservoir;
      iii. Appearance of reservoir inflow (color, turbidity, and sedimentation);
      iv. Gate settings; and
      v. Condition of all equipment.

   b. Clean Water Diversions

      i. Condition of the clean water diversion ditches;
      ii. Erosional features; and
      iii. Sedimentation.

   c. Sedimentation Basin

      i. Condition of the Sedimentation Basin.

   d. Roads

      i. Significant erosion of the all-weather roadways; and
      ii. Any reduction in the bearing capacity of roadways.

   e. Sediment Disposal Cells

      i. Distortion, erosion, or movement of the sediment disposal cells.

   f. Earthworks

      i. Any unusual movement of the embankment or hillslope earth materials, including slumping, flow slides, mudflows, or landslides.

g. Consolidated Hematite Pile Storage Area

   i. Any erosional features for the cap of the consolidated hematite pile; and
   ii. Sedimentation of the water diversion ditches.

h. Upper Slickrock Creek Clean Water Diversion

   i. Condition of the USBR inlet structure;
   ii. Condition of the new clean water diversion inlet structure;
   iii. Condition of the Catfish Pond Settling Basin; and
   iv. Condition of the roadway, pipeline, and spillway.

i. All other information relevant to the performance and reliability of the SCRR and related facilities.

10. The inspection reports shall clearly state recommendations for performing routine and emergency repair of the facilities. The inspector shall sign, date, and note the time of the inspections in the inspection reports. The Site Operator shall expeditiously implement appropriate repairs and maintenance. The O&M Plan shall clearly establish procedures and responsibilities for implementing recommended repairs and maintenance identified by the inspection program.

11. The Site Operator shall document implementation of the inspection and maintenance program, including providing explicit, written responses to the inspection recommendations for repair, documentation of the implementation of maintenance and repairs, and noting the date that repairs to the facilities were completed.

12. The Site Operator shall inspect, maintain, and repair the upper hematite pile and lower hematite pile tailings storage area in conformance with the applicable O&M plan for the SCRR and the Slickrock Creek Basin. Stabilization of the gossan tailings, or hematite, pile was completed in 2002, as described in the *ROD 4 Remedial Action Report, Slickrock Creek Retention Reservoir* (CH2M HILL, 2004).

13. Due to the hazardous nature of the hematite materials, the Site Operator shall develop environmental protection plans, as needed, for excavating, handling, loading, hauling, dumping, spreading, and compacting the hematite materials. The environmental plans shall address all pertinent federal and state regulations, including OSHA requirements.

14. The Site Operator shall inspect and maintain the lower hematite pile tailings storage area in conformance with the draft O&M Plan for the Slickrock Creek Basin. This storage area was built during the Slickrock Creek Dam construction (under separate contract).

15. The Site Operator shall document all inspections in the inspection report and store data obtained during the inspections in a database system to track completion of all inspections and the condition of the facilities.

9.12.3 Non-routine O&M Requirements for the Slickrock Creek Basin

1. The Site Operator shall establish a minimum 14-acre-foot sedimentation capacity (between the sediment basin and upper sediment check structures) at the start of each water year (October 1) and maintain at least 10 acre-feet of capacity during the period from December through March of each year. The sediment basin was initially built

during the Slickrock Creek Dam construction (under separate contract), and the upper sediment check structures were constructed by the Site Operator.

2. The Site Operator shall conduct wet winter excavation of drainage ditches and the sedimentation basin and sediment check structures, if required, during major storm events (for example, more severe than a 5- to 10-year event). Depending on conditions, the Site Operator may need to perform some excavations at night (during major storm events or Emergency Responses only). The Site Operator shall have equipment onsite or readily available (mobilization to the Site within four [4] hours).

3. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the consolidated Hematite Pile tailings storage area. As part of the annual report, the Site Operator shall detail performance of the consolidated storage area, document observed erosion, and document the condition of the toe berm and hematite check structure

9.13 Boulder Creek Landslide Area

9.13.1 Unit Description

1. The Boulder Creek landslide occupies an area of approximately 55 acres in the vicinity of the Richmond Mill buildings. Significant movement of the landslide is reported to have occurred a minimum of five times in the past 75 years. More frequent movement within this period could have occurred because the historical record is incomplete. The landslide moved most recently during the El Niño storms in 1998.

2. Morrison Knudsen (MK) investigated the El Niño 1998 movement of the landslide for SMC. The landslide appeared essentially to move in a very large block with relatively little internal distortion except at the perimeter of the movement, although differential movement was detected by the surveys conducted by Pace Engineering. Pace Engineering reported that the landslide movement caused extension (at the top of the landslide) and compression (at the toe of the landslide) of the AMD pipeline that extends from the Richmond Mill buildings to the Lawson portal area. This movement severely distorted the timber structure supporting the Lawson adit for a distance of approximately 115 feet, and caused roof falls further into the adit.

3. The Boulder Creek landslide is a concern for several reasons, including the following:

   a. Potential to disrupt or destroy the AMD pipeline that conveys the Richmond discharges from the Richmond to the Lawson area under small or large movements;

   b. Potential disruption of the access to the Richmond portal;

   c. Potential to cave the Lawson tunnel; and

   d. Large movements may have the potential for plugging Boulder Creek, damming the creek, failing the Lawson road and Lawson AMD pipeline, and potentially flooding and failing the downstream Iron Mountain Road. A similar flood event occurred during failure of a tailings dam in Boulder Creek in about 1950.

4. The O&M Unit Components for the Boulder Creek landslide area include, but are not limited to, the landslide, horizontal drains, settlement monuments, surface-water

diversion ditches and structures, roads, and former sites of tailings disposal locations. However, monitoring wells will not be removed without approval from EPA.

9.13.2 Routine O&M Requirements for the Boulder Creek Landslide Area

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the O&M Unit Components of the Boulder Creek landslide area in a manner that ensures reliable performance of the IMM Remedy and in a manner that reliably achieves the Performance Standards and the other requirements of this SOW.

2. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the surface-water control ditches and structures, and the horizontal groundwater drains in the area of the Boulder Creek landslide. The Site Operator shall regularly inspect and remove debris and sediments from the surface-water control ditches and structures in a manner that minimizes the risk of and prevents clogging and loss of control of surface-water flows.

3. The Site Operator shall clean surface-water control ditches and structures:

   a. Annually to restore full flow capacity; and

   b. At all other times (including during storm events), as needed to ensure a minimum of approximately 80 percent of full flow capacity at all locations.

9.13.3 Non-routine O&M Requirements for the Boulder Creek Landslide Area

1. The Site Operator may propose to implement additional groundwater and surface-water controls that it believes will be cost-effective and provide long-term benefit by reducing O&M cost related to movement of the Boulder Creek landslide.

2. The Site Operator shall inspect the surface-water control ditches and structures, and the horizontal groundwater drains in the area of the Boulder Creek landslide on an annual basis and make necessary repairs to ensure that they achieve the requirements of this SOW and the Performance Standards.

3. The Site Operator shall conduct an annual survey of the Boulder Creek landslide area to determine the degree of movement of the landslide and to formulate plans for protecting the AMD pipelines, the adits, and the access roads. The survey shall be conducted by a registered land surveyor and shall include the available benchmarks and survey points listed in the document *Iron Mountain Mine, Surface Movement in the Richmond and Lawson Portal Area,* Stauffer Management Company, August 1998, any other survey data, and any other necessary benchmarks. The Site Operator shall conduct more frequent surveys of the landslide area if movement of the landslide is observed. If movement of the landslide is observed, the Site Operator shall conduct a sufficient number of surveys to develop emergency plans to ensure collection and conveyance of the Designated Contaminant Discharges and continuous access and operation of the Richmond and Lawson mine workings. If existing benchmarks are destroyed, the Site Operator shall reestablish the appropriate benchmark.

4. The Site Operator shall take appropriate actions in response to movements of the Boulder Creek landslide to ensure reliable performance of the IMM Remedy.

9.14 Sampling Program

1. The sampling program is designed to monitor the performance of the MFTP and the O&M Units at the Iron Mountain Mine Site. In general, the sampling methods, procedures, equipment, and reporting formats used by SMC during the 1999-2000 season may be used to form the initial basis for the Site Operator's Sampling Plan. The Site Operator shall modify, as necessary, the Sampling Plan to meet the requirements of this SOW. IT Iron Mountain Operations LLC submitted the *2001 Quality Assurance Project Plan, Iron Mountain Operations, LLC, Redding, Shasta County, California to the Oversight Agency* in April 2001, which presents the sampling process design.

2. The Site Operator shall conduct the Iron Mountain Mine Sampling Program and inspect, operate, maintain, repair, replace, and upgrade all field and laboratory equipment used to implement the sampling program. The Site Operator shall develop effective operation and maintenance procedures for the sampling program.

3. The Site Operator shall conduct sampling, analytical testing, and field testing in conformance with the requirements given in Section 14, *Performance Standards and Verification Plan*. The sampling program will be conducted in accordance with the approved Health and Safety Plan and the approved QAPP.

4. On an annual basis or more frequently as requested by the Oversight Agency, the Site Operator shall provide the complete analytical database to the Oversight Agency in a format acceptable to the Oversight Agency.

5. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade the Mouth of Boulder Creek (BCMO) weir and gage station in general compliance with the USGS document *Discharge Measurements At Gaging Stations, Book 3, Chapter A8, 1984*. The Site Operator may comply with this requirement by demonstrating that the calibrations and methodologies performed by SMC satisfy the criteria and methodologies contained in the USGS document. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade all equipment and materials including the BCMO weir, electrical equipment, sampling equipment used to obtain daily composite stream samples for analytical testing, rainfall recording equipment, water-level recording equipment, and the stilling well.

6. The Site Operator shall maintain a stilling basin upstream of the BCMO weir for proper functioning of the weir. At a minimum, the Site Operator shall remove sediment from the stilling basin annually, and more often, as required to ensure a quiescent surface upstream of the weir and constant head between the stilling well and the weir.

9.15 Boulder Creek Cementation Plant

1. The Boulder Creek Cementation Plant (BCCP) was constructed around 1957 to treat AMD discharges from the Richmond and Lawson mine workings. The plant was operated intermittently through September 1994, at which time the MFTP was put into full-time service at the site. The Site Operator is not required to maintain the BCCP.

9.16 Security Systems

9.16.1 Unit Description

1. The security systems include, but are not limited to, two electronic, locally and remotely controlled gates on Iron Mountain Road. The Site entry gate provides primary access to the Site, sludge drying beds, and MFTP, and is located on Iron Mountain Road downstream of the Flat Creek crossing. The entry gate system includes overhead lighting, a keypad entry control panel, an intercom that allows communication with the MFTP operation room, remote operations capability, a pressure pad embedded in the roadway that triggers the gate motor, a gate motor, and a gate.

2. The secondary Site electronic gate, located just above the MFTP, controls access on Iron Mountain Road above the MFTP and includes a magnetic key entry pad, remote operations capability, a pressure pad embedded in the roadway that triggers the gate motor, and a gate.

3. The security systems include, but are not limited to, blocked access points consisting of earth berms and locked gates (posts, chain link, angle iron, and other materials) positioned across roadways that lead offsite in the Upper Slickrock Creek Basin, Upper Boulder Creek (north of Brick Flat Pit), and Spring Creek watersheds.

4. The security systems include locked gates at the Richmond and Lawson portals, and at the SCRR valve house and electrical room.

9.16.2 O&M Requirements for the Security Systems

1. The Site Operator shall control access to the Site and shall prevent unauthorized individuals from entering the Site. The Site entry gate shall remain closed, except during emergencies and during those periods that the Site Operator or the Oversight Agency retains direct control of the entry. In general, absent a change in conditions, the Site Operator may use the procedures used by SMC during 1999-2000.

2. The Site Operator shall maintain a list of individuals and companies that possess the keypad entry codes to the primary gate, and secondary Site gate, and keys to all gates and facilities.

3. The Site Operator shall operate and maintain the electronically operated and heavy-duty steel gates, including all parts, components, and directional signs.

9.17 Downgradient Property

9.17.1 Unit Description

1. The downgradient facilities currently include erosion protection on the Rardin property, the erosion protection for Iron Mountain Road at Flat Creek, the erosion protection on the former Finazzo property near Flat Creek Bridge, the berm on the edge of the Indian Occupation Archaeological site, and the erosion protection at the Flat Creek Bridge.

2. SMC has installed a new water supply system and erosion protection on the Rardin property, however ongoing maintenance of the water supply system is not included in this SOW.

3. The increased flow in Flat Creek due to the Upper Spring Creek Diversion has caused erosion to downstream property owners' land, erosion of the stream banks along Flat Creek, and undermining of the foundation of the Flat Creek Bridge. In the storm of December 31, 1996, the Flat Creek Bridge abutments were undermined, and the bridge became unsafe. SMC closed the Upper Spring Creek Diversion, made emergency repairs to the Flat Creek Bridge, and negotiated with Mr. Finazzo to obtain temporary access across his property in the form of a temporary ford of Flat Creek. These measures were taken in order to keep the lime supply deliveries coming to the Site.

4. EPA reconstructed the Flat Creek Bridge in the fall of 1997. The new bridge was designed to withstand a 100-year storm event without failure of the bridge. It is highly unlikely that a bridge failure would occur in the future. However, the approach abutments will erode and will require maintenance during lesser storm events.

9.17.2 O&M Requirements for Downgradient Property

1. The Site Operator shall maintain, repair, or upgrade the improvements at the downgradient locations in a manner that prevents damage to downstream properties from actions taken in connection with the IMM Remedy. However, the Site Operator is not responsible for any maintenance of the water supply system on the Rardin (or subsequent owners) property except as directly related to erosion or additional flows in connection with the IMM Remedy.

2. The Shasta County Public Works Department is responsible for maintenance of the Flat Creek Bridge. The Site Operator is responsible to repair and maintain the riprap on the abutments as related to the increased flow in Flat Creek due to the Upper Spring Creek Diversion. The Site Operator is responsible to maintain access to the Site, of which this bridge is a major component.

3. The Site Operator shall maintain the Flat Creek embankment protections immediately downgradient of the Upper Spring Creek Diversion impact structure.

4. The Site Operator shall coordinate with the Oversight Agency prior to initiating repairs of the offsite facilities.

9.18 Waste Disposal Facilities

9.18.1 Unit Description

1. Waste disposal facilities include the Waste Rock Disposal Cell, located above the Richmond Mill buildings, the waste disposal cells located at the temporary treatment plant site near the intersection of Iron Mountain Road and the Jeep Trail, and the muck disposal cell (also called Mine Waste Disposal Cell), which was completed in 2003.

2. The muck disposal cell was constructed to store pyritic materials generated by cleanout of the grit chambers, existing pyritic materials that have been stored temporarily at the Lawson laydown area and the Richmond Mill buildings, and pyritic muck that the Site Operator shall remove periodically from the mine workings.

3. The design for the existing Waste Rock Disposal Cell is provided in the plan documents entitled *Iron Mountain Mine Waste Rock Removal/Disposal, Construction Drawings, Iron*

Mountain Site, Shasta County, Redding, California. (SMC, July 1994). The specifications for the construction are also dated July 1994.

4. The waste disposal facilities include the excavated remnant surfaces and hillslopes near the Richmond Mill buildings and elsewhere in the Boulder Creek Basin from which tailings and waste rock were removed in conjunction with ROD2. SMC designed and constructed a permanent cap over one of the beds (Pond 2).

5. The Mine Waste Disposal Cell design was submitted by the Site Operator in the December 2001 *Final Design for the Richmond Adit Waste Repository Cell, Iron Mountain Mine Operations, LCC, Shasta County, Redding California.*

9.18.2 O&M Requirements for Waste Disposal Facilities

1. The Site Operator shall inspect, operate, maintain, repair, replace, and upgrade all waste disposal facilities, including disposal caps, drainage ditches and structures, and underdrain discharge systems.

2. For all disposal facilities, the Site Operator shall maintain drainage ditches and drainage structures to control surface-water drainage in a manner that prevents erosion of the cap, drainage ditches, and capped pyritic materials.

3. Pursuant to this SOW, the Site Operator constructed a 6,000-cubic-yard mine waste disposal cell to contain muck from the initial muck removal program for the Richmond Mine, for ongoing muck removal programs, and for consolidation and capping of mining wastes that were previously stored at temporary locations (including wastes at the Lawson lay-down area, and at the Old/No. 8 grit chambers). Construction of the disposal cell included the following work elements as documented in the *Richmond Adit and Drifts Rehabilitation As Built Report* (North Pacific Research, October 2004):

    a. The disposal cell was constructed and operated in conformance with the mining regulations of Title 27, California Code of Regulations. The Site Operator shall provide for the long-term maintenance of these future mine waste disposal cell in a manner that preserves or improves the function and condition of the facility consistent with the design approved by the Oversight Agency.

    a. Construction of the disposal cell was documented in the *Richmond Adit Mine Waste Repository Cell – Final As-Built Report* (Shaw Environmental and Infrastructure, August 2002);

    b. The Site Operator shall be responsible for expanding the 6,000-cubic-yard disposal cell, if required, at a later date, unless there are no Extreme Events that generate mine muck that the Site Operator deposits into the cell. If the capacity of the cell is exceeded in the case where there are no Extreme Events that generate mine muck that the Site Operator deposits into the cell, then expansion of the 6,000-cubic-yard cell will be considered Work beyond the Scope of this SOW unless the Site Operator voluntarily constructs other cells or expanded capacity.

10. Emergency Response

1. In the event of any action or occurrence during the performance of the activities required by this SOW that causes or threatens a release of Waste Material from the Site that constitutes an emergency situation or may present an immediate threat to public health or welfare or the environment, the Site Operator shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release and shall immediately, and not later than four (4) hours after commencing the Emergency Response activities, notify the Oversight Agency's Project Manager, and the Support Agency officer. Support Agency officer: Regional Water Quality Control Board, Central Valley Region, 315 Knollcrest Drive, Redding, CA 96002, (530) 224-4845. The Support Agency will notify the Oversight Agency and the Site Operator of changes to the Support Agency officer for purposes of emergency response notification. If the Oversight Agency's Project Manager is unavailable, the Site Operator shall contact the Oversight Agency's Alternate Project Manager. If neither of these persons is available, the Site Operator shall notify the EPA Emergency Response Unit, Region 9 (Telephone 800-300-2193). The Site Operator shall take such actions in consultation with the Oversight Agency's Project Manager or other available authorized Oversight Agency officer or designated representative and in accordance with all applicable provisions of the Health and Safety Plans, and any other applicable plans or documents developed pursuant to this SOW.

2. In the event that the Site Operator fails to take appropriate response action as required by this Section, and the Oversight Agency takes such action instead, the Site Operator shall reimburse the Oversight Agency, as appropriate, for all costs of the response action not inconsistent with the NCP, pursuant to Section XVI of the Consent Decree (Reimbursement of Response Costs), subject to the right of the Site Operator to dispute whether the action taken by the Oversight Agency was required to have been taken by the Site Operator under the terms of this SOW, the Consent Degree, or the O&M Plan and to dispute whether the cost incurred were not inconsistent with the NCP.

3. Nothing in the preceding Paragraph or in the Consent Decree shall be deemed to limit any authority of the United States or the State to take all appropriate action to protect human health 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, nor shall it be deemed to waive any defense of the Site Operator to actions taken pursuant to the authorities reserved under this Section 10(3) except to the extent such defenses are limited by this SOW or the Consent Decree.

4. Conditions that require notification pursuant to this Section include, but are not limited to:

    a. Conditions that may result in the release, in amounts greater than 10 gallons over a 24-hour period, of untreated or partially treated Designated Contaminant Discharges into the environment;

    b. Conditions that place the Site Operator in jeopardy of not being able to treat all Designated Contaminant Discharges in compliance with this SOW and the Performance Standards Verification Plan (Section 14);

c. Conditions that place the Site Operator in jeopardy of not being able to collect and convey all Designated Contaminant Discharges to the MFTP, including but not limited to problems with the mine workings (muck surge, mine plugging, mine collapse), grit chambers, or pipelines;

d. Conditions that place the Site Operator in jeopardy of operating the MFTP in ASM mode;

e. Conditions that may result in failure of a waste cell that may, in the Site Operator's reasonable judgment, result in the release of mine tailings or mine waste into the environment;

f. Conditions that may, in the Site Operator's reasonable judgment, result in failure of BFP that causes release of sludge into the environment;

g. Conditions that may, in the Site Operator's reasonable judgment, result in failure of the Boulder Creek Tailings Dam;

h. Conditions that may, in the Site Operator's reasonable judgment, result in failure of the SCRR or related facilities;

i. Conditions that may, in the Site Operator's reasonable judgment, require the Site Operator to take action in response to a failure or potential failure of a surface-water diversion;

j. Failures or risk of failures that occur as a result of earthquakes, wildfires, structure fires, or other Extreme Events;

k. Conditions that may prevent Site access, such as potential or actual failure of access bridges or access roads;

l. Conditions that may result in a discharge to Flat Creek of AMD, treated or partially treated effluent, drying bed filtrate, or contaminated stormwater;

m. Conditions that may result in failure of the offsite facilities, such as embankment protection on downstream properties; and

n. Any failure, collapse, subsidence, dissolution, or impairment of the mine workings that results in discharge of Designated Contaminant Discharges from any other location than the current AMD collection locations or locations designated for collection in the SCRR.

11. Response to Extreme Events

1. The Site Operator shall take all steps necessary to respond to, repair, and correct problems created by failures (each an "Extreme Event") or risk of failures caused by one or more perils ("Perils"). The perils that may affect the Site include those perils listed in Section 11(2) below. The steps include actions necessary to respond to, repair, and correct problems caused by any and all failures that threaten, endanger, or that have interrupted continuous collection, conveyance for treatment, and treatment of Designated Contaminant Discharges or that otherwise threaten to interfere with the

ability of the Site Operator to reliably achieve the Performance Standards under all conditions. These failures include, but are not limited to:

a. Failures that occur during extreme events listed in the document *Settlement Risk Assessment* (SRA), prepared for EPA by CH2M HILL (March 2000). These failures include:

   i. Failure of the Boulder Creek Tailings Dam;

   ii. Failures resulting from mine collapse, mine plugging, plugging of adits, collapse or caving of adits, collapse or caving of mine portals, collapse or caving of mine workings;

   iii. Any failure, collapse, subsidence, dissolution, or impairment of the mine workings that results in discharge of Designated Contaminant Discharges from any other location than the current AMD collection locations or locations designated for collection in the SCRR;

   iv. Failure of the Richmond, Lawson (Hornet Mine), or Old No. 8 Mine workings;

   v. Movement of the Boulder Creek landslide resulting in failure of mine workings, roadways, AMD collection and conveyance facilities, monitoring wells, waste rock disposal cell, or impairment of Boulder Creek;

   vi. Movement of the Slickrock Creek landslide resulting in failure of the clean water diversions, sedimentation basin, Old/No. 8 Mine Pumps PW2 and PW3, grit chambers, access roads, or the SCRR, or in filling of the SCRR or sedimentation basin; and

   vii. Failure of access roads, infrastructure, Upper Spring Creek Clean Water Diversion, bridges, culverts, utilities, utility power supply, or electrical generators;

b. Failures that occur during extreme events not listed in the SRA that may affect the IMM Remedy or the ability of the Site Operator to meet the Performance Standards or other requirements of this SOW;

c. Dam and pipeline failures;

d. Failure of any O&M Unit, any O&M Unit Component, or part thereof, and any Site facility, improvement, or any personal property thereon resulting in the Site Operator's inability to effectively implement the IMM Remedy or meet the Performance Standards or other requirements of the this SOW; and

e. Any failure resulting from or relating to any of the conditions identified in Section 10(4) to the extent such failure is not previously identified above; and

2. The Perils that may affect the Site include, but are not limited to :

   a. Earthquake, subsidence, earth movement, landslide, mudslide, or sinkhole;

   b. Volcanic eruption, volcano, or other material expelled by volcanic action;

c. Precipitation, including rain, snow, ice, sleet, hail, in excess of a twenty-five (25)-year, twenty-four (24)-hour storm (e.g., 9.7 inches in twenty-four (24) hours) (as measured by the onsite rain gauge located at the MFTP and corroborated by at least one other data point such as Shasta Dam, the rain gauge at BCMO, or flow at BCMO); floods from natural or manmade bodies of water; flood waters; surface or rising waters; the release of water; the rising, overflowing, or breaking of boundaries of natural or manmade bodies of water; or the spray from any of the foregoing;

d. Water that backs up through sewers, drains, or pipes;

e. Pressure from water below the surface of the ground; pressure or explosion from gases underground;

f. Fires, including wildfires and structure fires;

g. Sonic shock waves;

h. Lightning and fire caused by lightning;

i. Freezing, vaporization, or sublimation;

j. Windstorms, including sand or dust whether driven by the force of wind or not;

k. Weight of snow, sleet, rainwater, hail, or ice;

l. Meteorites;

m. Dampness or dryness of atmosphere or extremes of changes in temperature;

n. Falling objects, natural and manmade;

o. Smoke;

p. Theft;

q. Electric arcing;

r. Explosion;

s. Vandalism and malicious mischief;

t. Labor disputes; and

u. Unusual delays in transportation.

3. Any failure, peril, or condition that is not an Extreme Event is considered, for purposes of this SOW, Non-routine O&M. To the extent the Site Operator is required to anticipate and prevent an Extreme Event and any failure resulting therefrom, that Work shall not be considered an Extreme Event.

4. After an Extreme Event, the Site Operator shall comply with the RD and RA requirements to the extent required by Sections 12 and 13.

12. Remedial Design

12.1 Introduction

1. The Site Operator shall comply with the Remedial Design and Remedial Action requirements of Sections 12 (this Section) and 13 for all construction projects to be carried out in connection with this SOW and except as specified in Section 12.1(2) below.

2. The procedural requirements for Remedial Design vary depending on the scope of the RD and RA activity:

   a. For RD/RA projects that are expected to cost less than $50,000 (adjusted by the Inflation Escalator), the Site Operator shall comply with the requirements set forth in Section 6.3, *Annual Operations Work Plan*, Section 6.7, *Monthly Progress Reports*, Section 12.2, *Remedial Design Objectives*, and need not comply with other requirements of Section 12, *Remedial Design*, or Section 13, *Remedial Action*.

   b. For RD/RA projects that are expected to cost more than $50,000 (adjusted by the Inflation Escalator) but less than $250,000, the Site Operator shall comply with the requirements of Section 6.3, *Annual Operations Work Plan*, Section 6.9, *Monthly RD/RA Progress Reports* and Section 12.2, *Remedial Design Objectives*.

   c. For RD/RA projects that are expected to cost $250,000 or more (adjusted by the Inflation Escalator), the Site Operator shall comply with the requirements of Section 12, *Remedial Design* (this Section), and Section 13, *Remedial Action*, unless those requirements are waived by the Oversight Agency.

3. Upon Oversight Agency approval, the Site Operator may modify the schedule of deliverables required by this Section based on the nature of the project and other factors as determined by the Oversight Agency.

12.2 Remedial Design Objectives

1. This Section sets forth the general design objectives for RD and RA projects that the Site Operator carries out in connection with this SOW.

2. The criteria used to design the O&M Units to achieve the Performance Standards for the IMM Remedy are described in applicable Design Criteria Reports, Engineering Analysis Reports, designs, and other design documents produced during the design of the facilities to implement the IMM Remedy.

3. If the original design was able to (and is expected to be able to in the future) achieve the Performance Standards and other requirements of this SOW in a highly reliable manner, the Site Operator may rely on the original design in performing a repair or replacement of the facility, as modified to conform with the then-current building and other applicable codes.

4. If the original design was not able to achieve (or can be demonstrated empirically to be unable to achieve in the future) the Performance Standards and other requirements of this SOW in a highly reliable manner, the Site Operator shall design necessary upgrades and reconstruct or repair the facility in a manner that will meet the Performance

Standards and other requirements of this SOW in a highly reliable manner. To the extent applicable, the Site Operator may redesign the facility consistent with the original design intent for the IMM Remedy, including the design documents listed in Attachment D to this SOW.

5. The Site Operator may propose for consideration by the Oversight Agency an alternative design for facilities if the approach is equal or superior to the original design intent in terms of safety, reliability, durability and function.

   a. A primary objective of the Oversight Agency is to collect, convey, and treat all Designated Contaminant Discharges in a highly reliable and safe manner under all conditions. If an Extreme Event alters Site conditions, the Site Operator may propose alternative designs for collecting and conveying all Designated Contaminant Discharges. In reviewing the alternative, the Oversight Agency will consider, among other factors, whether the approach provides a level of reliability, safety, and function that is equal or superior to the original design intent and whether the alternative will achieve the Performance Standards and other requirements of this SOW in a highly reliable manner.

   b. If a landslide reduces the volume of Slickrock Creek Retention Reservoir, the Oversight Agency will consider alternatives to re-establishing the original configuration of the retention reservoir and related facilities. The primary objective of the RD and RA after such a failure will be to maintain the original storage capacity, reliability, durability, and safety of the SCRR facilities. Factors to be considered in evaluating alternatives include, but are not limited to:

      i. Whether the alternative will provide the capacity to collect, store, and convey contaminated flows from Slickrock Creek area sources that is equal or superior to the original design intent.

      ii. Whether the alternative will provide a level of safety, durability, and reliability that is equal or superior to the original design intent.

      iii. Whether the alternative will settle out sediment and prevent sediment from entering pipelines and the treatment plant in a manner that is equal or superior to the original design intent.

      iv. Whether the alternative minimizes the collection of clean waters by diverting those flows around the collection system, thereby maximizing the collection, conveyance, and treatment of contaminated flows in a manner that is equal or superior to the original design intent.

   c. If a failure of the mine workings occurs, the Oversight Agency will consider alternatives to rebuilding the mine workings to their original configuration. Factors to be considered include, but are not limited to:

      i. Whether the alternative will restore the original flow under all conditions; and

ii. Whether the alternative will provide a level of safety and reliability (including appropriate redundancy) that is comparable or superior to the original design approach.

6. At a minimum, the Site Operator shall maintain the same reliability and safety at the Site throughout the Performance Period.

12.3 General Requirements for Remedial Designs

1. The Site Operator shall submit to the Oversight Agency remedial designs for all RA activities having construction costs greater than $250,000 for Oversight Agency review and approval. RD shall be conducted pursuant to requirements for project planning and coordination, engineering analyses, designs, and specifications listed in this Section.

2. The RD documents shall provide the technical details for implementation of required Remedial Actions in accordance with accepted environmental protection technologies, standard professional engineering and construction practices, and County, State, and federal regulations, including the requirements of the California DSOD.

3. The Site Operator shall submit clear and comprehensive plans and specifications. Review and/or approval of design submittals allows the Site Operator to proceed only to the next step of the design process. It implies neither acceptance of later design submittals that have not been reviewed, nor that the RA, when constructed, will meet the Performance Standards. All components, facilities, and Site changes associated with construction shall be designed and constructed in a robust manner, ensuring long-term reliable service.

4. The Site Operator shall submit the following deliverables for each RD:

   a. Project Delivery Analysis;
   b. Design Criteria Report;
   c. Engineering Analysis Reports;
   d. Preliminary Design (20 percent);
   e. Intermediate Design (50 percent);
   f. Prefinal Design (90 percent); and
   g. Final Design (100 percent).

12.3.1 Project Delivery Analysis

1. The Project Delivery Analysis (PDA) will provide the project plan for completing the RD and RA. The Site Operator shall submit for Oversight Agency review and approval a draft PDA, and a draft Final PDA that becomes final with incorporated comments.

2. The draft PDA shall include a step-by-step plan for completing the RD and RA, and for satisfying all requirements, including but not limited to, the Performance Standards and all other requirements contained in this SOW. The draft PDA shall describe in detail the tasks and deliverables the Site Operator will complete, and provide a schedule for completing the tasks and submitting the deliverables.

3. The draft PDA shall identify and detail all time-critical components for procurement and construction that require initiation prior to formal review of the prefinal plans and specifications. The draft PDA shall develop in detail the design, design review, and

construction and scheduling requirements for these time-critical components. The draft PDA shall provide for Oversight Agency review and approval of the preliminary, pre-final, and final designs for each time-critical component. The Site Operator shall implement the design and construction tasks for time-critical project components pursuant to the approved PDA to enable procurement and construction in accordance with the necessary expedited schedule.

4. The Oversight Agency shall review the draft PDA and will provide review comments to the Site Operator within twenty-one (21) days of receipt of the draft PDA from the Site Operator. The Site Operator shall revise the draft PDA to incorporate the Oversight Agency review comments and submit a draft Final PDA for Oversight Agency review. The Oversight Agency shall review the draft Final PDA for conformance with the Oversight Agency review comments. The Oversight Agency will approve the draft Final PDA with incorporated comments.

5. The Site Operator shall submit for Oversight Agency review and approval the Design Criteria Report, the Engineering Analysis Reports, the Preliminary Design, the Intermediate Design, the Prefinal Design, and the Final Design in accordance with the Final PDA, in accordance with Section 12.3.1(4) above.

12.3.2 Design Criteria Report

1. The Design Criteria Report shall define in detail the technical parameters upon which the design will be based. The Design Criteria Report shall include the preliminary design assumptions; the engineering design standards; and the parameters, including geotechnical, structural, civil, hydrology, hydraulics, surveying, stabilizing concepts, and stability analysis, as required for completion of the design and as specified in the Final PDA.

2. The draft Design Criteria Report will be submitted to the Oversight Agency as part of the Preliminary Design submittal. The Oversight Agency will review the draft Design Criteria Report and provide review comments to the Site Operator within twenty-one (21) days of receipt of the draft Design Criteria Report from the Site Operator. The Site Operator shall revise the draft Design Criteria Report to incorporate the Oversight Agency review comments and submit a draft Final Design Criteria Report to the Oversight Agency for review. The Oversight Agency will review the draft Final Design Criteria Report and will provide written notice to the Site Operator within twenty-one (21) days of receipt of the draft Final Design Criteria Report from the Site Operator that either: (a) the draft Final Design Criteria Report is approved and becomes the Final Design Criteria Report, or (b) the Site Operator shall revise the draft Final Design Criteria Report in conformance with the Oversight Agency review comments and resubmit the draft Final Design Criteria Report for the Oversight Agency review and approval.

12.3.3 Engineering Analysis Reports

1. The Site Operator shall prepare Engineering Analysis (EA) Reports for each Remedial Design as required for completion of the design and as specified in the Final PDA. Examples of types of EA Reports include the following:

   a. Hydrology Report;

b. Hydraulics Report;
c. Geotechnical Data Report;
d. Geology Report;
e. Geotechnical Design Report;
f. Civil Design Report;
g. Mine Engineering Design Report;
h. Structural Design Report; and
i. O&M Plans.

2. Generally, the reports shall be modified as additional information is obtained and will be kept in draft form until the design is well established. The final reports must be compatible with the final design.

3. The Site Operator shall submit draft EA Reports as part of the Preliminary Design Submittal, draft Intermediate Design EA Reports as part of the Intermediate Design Submittal, draft Prefinal EA Reports as part of the Prefinal Design Submittal, and Final EA Reports as part of the Final Design Submittal for each Remedial Design. When required by State of California regulations or statutes, the Final Design EA Report shall be approved, sealed, and signed by a professional engineer registered in the State of California.

4. The Oversight Agency may, in its discretion, elect to not require certain EA Reports based on the nature of the project.

12.3.4 Preliminary Design (20 percent)

1. The Site Operator shall submit a Preliminary Design, at approximately 20 percent completion of the design effort, consisting of the items included herein. The Site Operator shall provide supporting data, preliminary engineering calculations, and documentation with the Preliminary Design documents to define the functional aspects of the project to demonstrate that the completed project will be effective in meeting the Performance Standards and all other requirements of this SOW.

2. The Preliminary Design shall include the following:

   a. Draft Design Criteria Report;

   b. Preliminary EA Reports providing preliminary engineering calculations completed in support of the Preliminary Design;

   c. Preliminary Project Delivery Strategy and Schedule;

   d. Preliminary Construction Schedule;

   e. Specifications Outline and Drawing List;

   f. Preliminary Design Drawings; and

   g. Identification of long-lead procurement items.

3. The Site Operator shall attend:

a. Preliminary Design Meeting 1: An informal 1-day working design review meeting with the Oversight Agency near the beginning of the performance of the Preliminary Design for the Site Operator to present descriptions of the initial design aspects and features that are expected to form the basis of the proposed Preliminary Design.

b. Preliminary Design Meeting 2: A 1-day meeting to present the Preliminary Design submittal to the Oversight Agency, including participation of key design staff, approximately 1 week after submittal of the Preliminary Design to the Oversight Agency.

4. The Oversight Agency shall review the Preliminary Design and provide review comments to the Site Operator within twenty-one (21) days after submittal of the Preliminary Design. The Site Operator shall consolidate and respond to each of the Oversight Agency's design review comments on the Preliminary Design Submittal. Within twenty-one (21) days from receipt of the Oversight Agency's written comments, the Site Operator shall provide a written response to each comment. The response shall indicate whether the Site Operator has decided to implement a design change as a result of the comment. The Site Operator shall implement all design changes required by the Oversight Agency in the Intermediate Design, but incorporation shall not be deemed to waive the Site Operator's right to challenge such comments in Dispute Resolution.

12.3.5 Intermediate Design (50 percent)

1. The Site Operator shall submit an Intermediate Design, at approximately 50 percent of design effort, consisting of the items included herein. Intermediate Design begins with the Preliminary Design and ends with the completion of approximately 50 percent of the design effort. The Intermediate Design Submittal is to be made after the Oversight Agency has provided comments on the draft Preliminary Design reports. The required Oversight Agency's comments on the draft Preliminary Design reports shall be incorporated into the Intermediate Design, but incorporation shall not be deemed to waive the Site Operator's right to challenge such comments in Dispute Resolution. The Site Operator shall provide supporting data and documentation with the Intermediate Design to define the functional aspects of the project and to demonstrate that the completed project will be effective in meeting the Performance Standards and all other requirements of this SOW.

2. The Intermediate Design shall include the following reports:

   a. Prefinal Design Criteria Report;

   b. Draft EA Reports, including draft engineering calculations;

   c. Revised Project Schedule;

   d. Draft Environmental Control Measures Plan (plans for items such as dust control, erosion control, slope stabilization, clean water drainage control, AMD drainage control, and sedimentation control);

e. Draft Construction Quality Assurance and Quality Control (CQAQC) Plan (including a materials testing plan, inspector(s)' qualifications and duties, inspection/testing frequencies, CQAQC reporting, laboratory certifications, and problem identification and corrective measures); and

f. Revised identification of long-lead procurement items.

3. The Site Operator shall attend:

   a. Intermediate Design Meeting 1: A 1-day informal design review meeting with the Oversight Agency during intermediate design for the purpose of presenting descriptions of the design aspects and features being incorporated. The meeting shall be held about halfway through Intermediate Design.

   b. Intermediate Design Meeting 2: A 1-day meeting for the Site Operator to present the Intermediate Design Submittal to the Oversight Agency, including participation of key design staff, approximately 1 week after submittal of the Intermediate Design to the Oversight Agency.

4. The Oversight Agency shall review the Intermediate Design and provide review comments to the Site Operator within twenty-one (21) days after submittal of the Intermediate Design. The Site Operator shall consolidate and respond to each of the Oversight Agency's design review comments on the Intermediate Design Submittal. Within twenty-one (21) days from receipt of the Oversight Agency's written comments, the Site Operator shall provide a written response to each comment. The response shall indicate whether the Site Operator has decided to implement a design change as a result of the comment. The Site Operator shall implement design changes required by the Oversight Agency but incorporation shall not be deemed to waive the Site Operator's right to challenge such comments in Dispute Resolution.

12.3.6 Prefinal Design (90 percent)

1. The Site Operator shall submit the Prefinal Design, at approximately 90 percent completion of the design effort, as the draft version of the Final Design. The Prefinal Design shall address comments generated from the Intermediate Design and clearly show any modifications of the design as a result of incorporation of the comments. The Prefinal Design shall be submitted in both hardcopy and electronic format.

2. The Prefinal Design shall include the following:

   a. Prefinal Design Specifications and Drawings, including a complete set of construction drawings in both full-size (one copy) and 1/2-size (three copies) reproductions, and specifications including general specifications, drawings, and schematics. Specifications shall conform to the Construction Specification Institute (CSI) format;

   b. Draft Final EA Reports incorporating required changes to the Draft EA Reports;

   c. Construction Schedule (identifying the timing for initiation and completion of critical path tasks and specifically identifying the duration for completion of the project milestones);

d. Draft Final Project Delivery Strategy and Schedule;

e. Draft Final Environmental Control Measures Plan; and

f. Draft Final Construction Quality Assurance/Quality Control (CQAQC) Plan.

3. The Site Operator shall attend a 1-day Prefinal Design review meeting with the Oversight Agency to present the Prefinal Design Submittal to the Oversight Agency, by key design staff, approximately one (1) week after submittal of the Prefinal Design to the Oversight Agency.

4. The Oversight Agency shall review the Prefinal Design and provide review comments to the Site Operator within twenty-one (21) days after submittal of the Prefinal Design. The Site Operator shall consolidate and respond to the Oversight Agency's design review comments on the Prefinal Design Submittal. Within twenty-one (21) days from receipt of the Oversight Agency's written comments, the Site Operator shall provide a written response to each comment. The response shall indicate whether the Site Operator has decided to implement a design change as a result of the comment, and how the change will impact RD/RA costs and/or schedule. The Site Operator shall incorporate all design changes required by the Oversight Agency but incorporation shall not be deemed to waive the Site Operator's right to challenge such comments in Dispute Resolution.

12.3.7 Final Design

1. The Site Operator shall incorporate all required Oversight Agency comments on the Prefinal Design in the Final Design, subject to Dispute Resolution in accordance with Section XIX of the Consent Decree. The Oversight Agency approval of the Final Design is required before initiating the RA, unless specifically authorized by the Oversight Agency. The Final Design shall be submitted in both hardcopy and electronic format.

2. The Final Design shall include the following:

   a. Final Design Specifications and Drawings including a complete set of construction drawings in both full-size (one copy) and 1/2-size (three copies) reproductions and specifications. If required by State of California statutes or regulations, Final Design Documents shall be approved, sealed, and signed by a professional engineer registered in the State of California;

   b. Final EA Reports incorporating changes to the Draft Final EA Reports;

   c. Final Project Delivery Strategy and Construction Schedule;

   d. Final Environmental Control Measures Plan;

   e. Final CQAQC Plan; and

   f. RA Cost Estimate.

13. Remedial Action

1. The Remedial Design requirements vary depending on the scope of the RD and RA activity. For RD/RA projects that are expected to cost less than $50,000 (adjusted by the

Inflation Escalator), the Site Operator shall comply with the requirements set forth in Section 6.3, *Annual Operations Work Plan*, and Section 6.7, *Monthly Progress Reports*, and need not comply with other requirements of Section 12, *Remedial Design*, or Section 13, *Remedial Action* (this Section).

2. For RD/RA projects that are expected to cost more than $50,000 (adjusted by the Inflation Escalator) but less than $250,000, the Site Operator shall comply with the requirements of Section 6.3, *Annual Operations Work Plan*, and Section 6.9, *Monthly RD/RA Progress Reports*. For RD/RA projects that are expected to cost $250,000 or more (adjusted by the Inflation Escalator), the Site Operator shall comply with the requirements of Section 12, *Remedial Design* and Section 13, *Remedial Action* (this Section), unless those requirements are waived by the Oversight Agency.

13.1 Changes to the RD during RA

1. RA projects having construction costs greater than $250,000 shall be designed pursuant to RD requirements given in Section 12. Any changes to the approved RD must be reviewed and approved by the Oversight Agency prior to any Work being performed on the activity.

2. RA projects having construction costs greater than $250,000 shall be constructed pursuant to RA requirements given in Section 13 (this Section).

13.2 Preconstruction Conference

1. Before issuing a notice to proceed, the Site Operator, its subcontractor, and the subcontractor's superintendent shall attend a preconstruction conference.

2. The purpose of the conference will be to introduce key personnel, define the authority and responsibility of key personnel, and establish the administrative procedures to be followed during construction.

3. The Oversight Agency may determine that the requirement for a preconstruction conference is unnecessary for any individual construction task because of the limited scope of the task or timing considerations.

4. The following issues and procedures shall be discussed and documented at the Preconstruction Conference:

   a. Define roles, relationships, and responsibilities of all parties;

   b. Review methods for documenting and reporting inspection data;

   c. Review methods for distributing and storing documents and reports;

   d. Review work area security and safety protocols;

   e. Review the construction schedule and project meeting schedule;

   f. Conduct a Site reconnaissance to verify that the design criteria, plans, and specifications are understood, and to review material and equipment storage locations;

   g. Record names of people in attendance at the meeting and the issues discussed;

h. Document clarifications made and special instructions issued;

i. Review the construction submittal requirements;

j. Review inspection requirements by outside agencies;

k. Review methods for addressing change order requests;

l. Review Site safety requirements; and

m. Review Site maintenance and cleanup procedures.

13.3 Preconstruction Reports and Plans

1. Prior to starting Work on the RA construction task, the Site Operator shall submit a Preconstruction Report detailing its approach for conducting the RA. The Preconstruction Report shall emphasize procedures to be used in any designated hazardous work area.

2. The Preconstruction Report shall address, at a minimum, the following items:

   a. Identification of the anticipated number of onsite personnel and their job functions, and identification of the anticipated equipment to be present onsite in performing the Work;

   b. Identification of the Health and Safety Officers and their education and experience;

   c. Submission of an Emergency Response Plan in accordance with Paragraph (L) of 29 CFR Section 1910.120; and

   d. Identification of the designated Work area.

3. The Preconstruction Report shall include a Health and Safety Plan (HASP) and a Construction Safety Plan (CSP). The HASP and the CSP shall incorporate and implement all required provisions of federal, state, and local safety regulations.

4. The Preconstruction Report shall include a Construction Management Plan (CMP). The CMP will describe how the construction activities shall be coordinated during the Remedial Action. The CMP will identify the line of authority among personnel during the construction activities, provide an organization chart, and provide descriptions of the duties of the key personnel. In addition, it will provide a discussion of the plan for the administration of construction changes and for the Oversight Agency review and approval of such changes. The CMP should provide for specific construction management activities such as preparatory, initial, follow-up, completion, and safety inspections of the construction; meetings; reports and documentation; Site security; and interaction with public agencies.

13.4 Site Security

1. Security of the designated Work area from trespass and vandalism shall be the Site Operator's responsibility.

2. The Site Operator shall control access to its designated Work area over the Site through vehicle gates that may at times be open or shut and locked as determined by the Site Operator. The Site Operator shall not leave the Site gates open to the public.

3. During RA construction, the Site Operator is responsible for the safety of all persons and property, including but not limited to, its employees, the employees of any contractors or subcontractors, inspectors, engineers, architects or any other person at the Site.

13.5 Perform the Remedial Action

1. Implement all tasks of the approved PDA to construct the RA, in accordance with the Final Plans and Specifications and approved HASP, CMP, and CQAQC.

2. The Site Operator shall have appropriate, onsite inspection during construction. The Site Operator shall produce daily reports detailing the construction activities and affirm that the day's Work complies with all design requirements. On days requiring the inspector's presence, the onsite inspector shall produce a report detailing those aspects of the Work inspected by him/her, and shall review and initial all other Site Operator's reports (daily, weekly, and monthly).

3. The daily reports shall be accumulated for one (1) month and sent to the Oversight Agency in conjunction with the Monthly Report. The daily reports, at a minimum, shall discuss the daily activities, summaries of problems and actions taken to rectify problems, and change orders. The Site Operator shall provide these reports during RA construction activities. Exception Reports (which are Daily Reports including information for activities not conforming to plans, specifications, or anticipated Site conditions) shall be generated as needed and sent via fax no later than the Work Day following the occurrence giving rise to an Exception Report.

13.6 Three-Phase Construction Inspection

1. The Site Operator shall implement the "Three-Phase" QC inspection process. The three-phase QC inspection process includes inspections of Work elements, called "Features of Work," during each phase of remediation, e.g., earthwork, geosynthetics, waste removal, road maintenance, etc. The three phases are the "Preparatory, Initial, and Follow-up" inspections.

2. Preparatory Inspections are performed before beginning each feature of Work for any onsite activity with the Site Operator's staff and all associated lower-tier subcontractors. These inspections include the following:

   a. A review of submittal requirements and other contract requirements with project personnel;

   b. Verification that provisions have been made to provide required field control testing;

   c. Examination of the Work area to ascertain that all preliminary Work has been completed;

   d. Verification of field dimensions, lines, and grades;

   e. Physical examination of materials and equipment;

f. Confirmation of measuring and test equipment calibrations; and

g. Assurance that required safety inspections have taken place and have been passed.

3. Initial Inspections are performed when Work begins on a particular feature of Work. The initial inspections include an examination of the quality of workmanship and a review of control testing for compliance with contract and Work Plan requirements. Those items inspected that fail to comply will be listed as exceptions in an Exception Report.

4. Follow-up Inspections are performed at appropriate intervals as the Work progresses on any particular feature of Work to verify compliance with contract requirements. As-built drawings will be checked for accuracy as required during this phase. The inspections continue until completion of that feature of the Work. Final follow-up checks will be conducted and all deficiencies corrected before the start of additional features of Work that may be affected by the deficient Work.

5. The Site Operator's Quality Control Program shall address the following elements:

   a. Procedure for reviewing and certifying submittals prior to issue to the Oversight Agency;

   b. Procedure for keeping as-built drawings current;

   c. Procedure for reporting deficiencies, including corrective action and follow-up inspections;

   d. Procedures for monitoring and keeping track of quantities;

   e. Document Control procedure to be used; and

   f. Description of the Work procedures to be used that detail construction and installation of materials on the project.

6. The Site Operator's Daily QC Report will serve as the basic document for recording the effectiveness of the QC program. The Daily QC Report will provide detailed information regarding jobsite location, Work performance, weather conditions, types and results of inspections, locations and descriptions of deficiencies, deficiencies corrected, and other comments. Documentation will be completed on all tasks throughout the project to maintain an accurate account of Site activities. In addition to the Daily QC Report, other documentation will be maintained for control and reporting of activities onsite as described below. Legible copies of these reports will be filed onsite and will be available upon request. All documents will be identified with the following information:

   a. Date;
   b. Contract name and number;
   c. Contractor name and address;
   d. Number and title of document; and
   e. Signature of originating individual.

7. The results of all tests conducted, both passing and failing, will be included in the Daily QC Report. This will include an assessment of how the failing test will affect Work and what will be done to correct the deficiency. Inspections and tests will be performed during fieldwork as part of the QC activities and project requirements. The three phases of inspections will be extended to each definable feature of Work during execution of project activities.

8. The field inspections planned for this project are primarily visual, but include measurements of materials and equipment, techniques, and final products. Inspections will be performed to confirm that a specific guideline, specification, or procedure for the activity is successfully completed. In addition, materials will be inspected for compliance with contract requirements.

9. As-built drawings will be maintained to ensure that accurate and current as-built conditions are documented on a weekly basis. The drawings will be marked to show any change with an appropriate reference to the modifying documentation e.g., Modification No., RFI No., etc. The as-built drawings shall be signed by the Site Operator's Project Manager.

10. Pre-Final Inspections shall be performed near the completion of a Feature of Work. The Oversight Agency will be notified in advance of the inspection. Inspection checklists will be used to evaluate the open items remaining to be finished. A Pre-Final Report will be issued to the Oversight Agency listing all outstanding items with associated scheduled completion dates and anticipated date for the Final Inspection.

11. Final Inspections shall be performed using the Pre-Final checklist of open items. A Final Report will be generated noting how all open items were completed. The Final Report will include all Exception Reports and their resolution.

    a. In conjunction with the Final Report, the Site Operator shall provide the Oversight Agency with a certification that the RA has been completed in conformance with the approved RD.

    b. If the Oversight Agency is satisfied that the RA has been properly constructed, the Oversight Agency shall provide written notice to the Site Operator of the acceptance of the constructed project.

12. Other inspection checklists may be necessary to accomplish the final inspection. Items such as the purchase order, designs, and/or drawings may be adequate for verification purposes.

13. Provision shall be made for reporting any deficiencies or unacceptable conditions found during final inspection and testing, and such deficiencies or unacceptable conditions shall be resolved prior to final acceptance.

14. Performance Standards and Verification Plan

14.1 Introduction

1. This Performance Standards Verification Plan (PSVP) provides minimum standards for operation of the Minnesota Flats Treatment Plant (MFTP) and other locations at Iron

Mountain Mine (IMM), including discharge prohibitions, treatment plant effluent limitations, stormwater limitations, receiving water limitations, and thickener waste sludge performance targets.

2. The PSVP provides the sampling, flow measurement, analytical laboratory testing, and reporting requirements for the collection, conveyance, and treatment systems, and the relevant receiving waters. The purpose of the PSVP is to provide Performance Standards and procedures that are used, in part, to assess compliance with the requirements for operations and maintenance (O&M) of the O&M Units.

3. The MFTP is designed to treat Designated Contaminant Discharges at the Site. These include acid mine drainage (AMD) discharges from the Richmond, Lawson, and Old/No. 8 Mine workings, and the area source discharges from the Slickrock Creek Basin. The plant was designed and constructed in accordance with the U.S. Environmental Protection Agency's (EPA) September 30, 1992, Record of Decision (ROD2) for the Boulder Creek Operable Unit; the September 24, 1993, Record of Decision for the Old/No. 8 Seep (ROD3); and the September 30, 1997, Record of Decision (ROD4) for the Slickrock Creek area sources.

4. This PSVP applies to the compliance of treated water and treatment residues with regulatory and environmental criteria (Applicable or Relevant and Appropriate Requirements [ARARs]) that are specified in the RODs or other official documents to ensure collection, conveyance, and treatment of Designated Contaminant Discharges, discharge of treated effluent, stormwater discharges from the MFTP, and disposal of treatment sludges in full compliance with Site ARARs. The PSVP also provides a limited description of process control test procedures that are performed by plant operating personnel for purposes of maintaining operating control over the plant. Process control tests are covered in detail in the *Operations and Maintenance Instructions, High Density Sludge Treatment Plant, Iron Mountain Mine-Redding, CA.*, included by reference as Attachment E to this SOW.

5. Sampling and analytical test requirements are provided for the MFTP and for the Boulder Creek, Flat Creek, and Slickrock Creek receiving waters to ensure that sample collection, analytical testing, and analysis methods provide satisfactory data to monitor the performance of the treatment plant, collection and conveyance facilities, and overall site performance.

6. This PSVP is organized into the following Sections:

   a. **Section 14.2**—Lists short-term and long-term Performance Standards for MFTP effluent, and target performance requirements for thickener waste sludge. Short-term standards will be used to assess treatment plant performance during treatment plant startup and shakedown following the planned modifications to the treatment plant and construction of the Slickrock Creek Retention Reservoir (SCRR). Long-term standards apply to the MFTP thickener overflow and sludge drying bed filtrate and, with target performance requirements for sludge discharge, are used to assess compliance and conformance with operational requirements for the MFTP.

b. **Section 14.3**—Lists the requirements for sampling, analytical testing, and reporting for the MFTP.

c. **Section 14.4**—Lists the requirements for sampling, analytical testing, and reporting for other onsite locations other than the MFTP.

d. **Section 14.5**—Lists procedures for sampling AMD, thickener overflow, thickener waste sludge, sludge drying bed filtrate, and sludge drying bed sludge. Section 14.5 also lists the procedures required for sample labeling and logging, sample handling, preservation, holding times, shipping, analytical chain-of-custody, and sample disposal.

e. **Section 14.6**—Lists the requirements for documentation of onsite analytical testing, offsite laboratory data packages, data summaries, and reporting.

f. **Section 14.7**—Lists data quality objectives consisting of quantitative specifications for the minimum quality of data used to monitor the MFTP and Site performance. Data quality assurance objectives are assessed by tracking data quality parameters, including representativeness, comparability, accuracy, precision, and completeness. Section 14.7 also provides a listing of appropriate analytical detection limits developed in accordance with regulatory and technical requirements, as well as consideration of analytical method limitations. In addition, the streamflow gauging requirements for accuracy are included in this Section.

g. **Section 14.8**—Provides the requirements for analytical data reduction, reporting, and evaluation, and includes specific requirements for computing precision and accuracy, and completeness.

h. **Section 14.9**—Provides a description of some of the quality assurance oversight procedures that could be implemented by the Oversight Agency.

i. **Section 14.10**—Provides a description of specific analytical methods developed for Iron Mountain Mine.

14.2 Performance Standards

14.2.1 Applicable or Relevant and Appropriate Requirements

1. Clean Water Act controls are imposed through National Pollutant Discharge Elimination System (NPDES) permits on a case-by-case basis. An NPDES permit currently is not required at the Site. The Performance Standards for operation of the facilities required to collect, convey, treat, and discharge Designated Contaminant Discharges together with monitoring and reporting criteria meet the substantive requirements of such a discharge permit. Therefore, even though no permit may be required, relevant portions of the O&M Plan required pursuant to this SOW shall be filed with the Regional Water Quality Control Board in lieu of an NPDES permit application and a Report of Waste Discharge.

2. The documents shall include a description of the discharge location(s); a process flow schematic of the collection, conveyance, treatment and discharge of AMD; an estimate of average and maximum discharges; and the averages and maximum discharge loads of regulated constituents.

14.2.2 Effluent Quality Requirements

1. Performance Standards for the treatment plant effluent are set by the ARARs. The ARARs include maximizing the removal of metals and attaining the metal removal performance achieved by the HDS treatment process since SCRR came online in June 2004.

2. The effluent from the MFTP includes thickener overflow and filtrate derived from the sludge placed in the sludge drying beds. The thickener overflow is discharged through the Treated Water Discharge System Tunnel into Spring Creek. The sludge drying bed filtrate is gravity-drained to the filtrate pump station and pumped to Spring Creek below the Upper Spring Creek Diversion.

3. The Site Operator shall discharge all thickener overflow and sludge drying bed filtrate to Spring Creek. The discharge of treated or partially treated Designated Contaminant Discharges to Flat Creek is prohibited.

4. The bypass of untreated or partially treated Designated Contaminant Discharges from the collection, conveyance and treatment facilities is prohibited, except as provided in Sections 8.4(6).

5. The direct or indirect discharge of wastes or materials, other than stormwater and treated MFTP effluent, is prohibited.

6. The ARARs specify that the AMD neutralization facility shall be designed and operated to maximize the removal of metals through the use of the HDS treatment process and, as a minimum, meet the Clean Water Act Effluent Guidelines and Standards for Ore Mining and Dressing at 40 CFR 440.102(a) and 440.103(a) as specified in Table 14-1.

7. The Clean Water Act system of technology-based effluent controls requires discharges to achieve the best practicable control technology (BPT) and the best available technology economically achievable (BAT). The existing HDS AMD neutralization facility has demonstrated metal discharge levels since SCRR came online in June 2004 that are substantially below the limits specified in Table 14-1. The HDS control technology currently employed at the facility constitutes BAT for the purpose of this SOW. The BAT effluent limitations based upon metal removal levels currently achieved at the IMM treatment plant are specified in Table 14-2 as daily maximum, seven (7)-day averages, and monthly average concentrations for copper, zinc, and cadmium in dissolved form. Detailed evaluation is presented in the *Fourth Five-Year Review Report for Iron Mountain Mine Superfund Site, Redding, California* (EPA, July 2008), Attachment 4 "Minnesota Flats Treatment Plant Effluent Discharge Iron Mountain Mine Five-Year Review." The Site Operator shall not be in violation with this section if the Site Operator has implemented best management practices.

TABLE 14-1
Clean Water Act Effluent Guidelines and Standards
Iron Mountain Mine Statement of Work

Parameter	30-Day Average [a] (mg/L)	Daily Maximum [b] (mg/L)
Copper (Total)	0.15	0.30
Cadmium Total)	0.05	0.10
Zinc (Total)	0.75	1.5
Lead (Total)	0.3	0.6
TSS [c,d]	20	30
pH [d]	6.0 to 9.0	6.0 to 9.0

[a] Average of daily concentration values for 30 consecutive days.
[b] Maximum allowable concentration measured for any one day.
[c] TSS = Total Suspended Solids.
[d] Applicable for discharge to Flat Creek
Note: Effluent limitations are from 40 CFR 440.102(a) and 440.103(a).

8. Operational experience has shown that even with the implementation of BAT, high winds can cause carryover of solids (TSS) in the thickener overflow to exceed 30 mg/L, and that this carryover of solids can, in some cases, cause exceedances of the daily maximum or 30-day average total copper and/or total zinc Performance Standards specified in Table 14-1. The Site Operator shall not be responsible for such exceedances to the extent that high wind conditions prevent the Site Operator from meeting the effluent limitations in Table 14-1. Under these high wind conditions, the Site Operator shall meet, as achievable utilizing BAT, the effluent limitations given in Table 14-1 for total metals in the thickener overflow. The Site Operator shall document in the Monthly Progress Report the days during which high wind conditions existed, plant performance relative to the TSS criteria and the total metals Performance Standards.

9. Effluent discharged to lower Spring Creek must comply with the effluent limitations specified above in Table 14-1 and Table 14-2, except for pH and TSS level. As stated in ROD2 and ROD3, EPA has determined that for the effluent discharged to lower Spring Creek, it shall not be necessary to adjust the effluent pH (approximately 8.5) because of the acidic nature and buffering capacity of this creek. Treatment to TSS levels prescribed in the Clean Water Act is not necessary because of the high TSS levels in this creek.

TABLE 14-2
Currently Achieved BAT Control Technology
Iron Mountain Mine Statement of Work

Parameter	30-Day Average [a] (µg/L)	7-Day Average [b] (µg/L)	Daily Maximum [c] (µg/L)
Copper (dissolved)	5	10	15
Cadmium (dissolved)	2	3	3
Zinc (dissolved)	100	150	300

[a] Running average of daily values for 30 consecutive days.
[b] Running average of daily values for 7 consecutive days .
[c] Maximum allowable for any one day

14.2.3 Short-term Performance Requirements

1. SCRR Startup and Shakedown Testing was performed between March and June 2004, as detailed in Appendix E, *Startup and Shakedown Performance Testing*, of the *ROD 4 Remedial Action Report, Slickrock Creek Retention Reservoir* (CH2M HILL, 2004).

2. Every 5 years hereafter, the BAT limits in Table 14-2 will be evaluated and modified, if appropriate.

14.2.4 MFTP Stormwater Performance Standards

1. Stormwater discharges shall not cause or threaten to cause pollution, contamination, or nuisance.

2. Stormwater discharges to Flat Creek or groundwater shall not adversely impact human health or the environment. Stormwater discharges into Flat Creek shall not cause or contribute to an exceedance of any applicable water quality standards contained in a Statewide Water Quality Control Plan or the Central Valley Regional Water Quality Control Board Basin Plan. Water quality standards are not currently (August 1, 2000) being met in Flat Creek due to AMD discharges from upgradient sources outside the Site.

3. The Site Operator shall not be in violation of Paragraph 2 of this Section 14.2.4 as long as the Site Operator has implemented Best Management Practices (BMPs) that achieve BAT/BCT and are included in a Storm Water Pollution Prevention Plan (SWPPP). In general, the Site Operator may include in its SWPPP and implement current BMPs and operating procedures as long as they are appropriate for the Site. IT Iron Mountain Operations LLC submitted the *Stormwater Pollution Prevention Plan* to the Oversight Agency in June 2001. If the monitoring program indicates that stormwater discharges from MFTP result in violations in Flat Creek, as specified in Paragraph 2 of this Section 14.2.4, the Site Operator shall revise the BMPs to achieve compliance with Paragraph 2.

4. The Site Operator may be required to implement a Stormwater monitoring program by the Oversight Agency if provisions listed in Paragraphs 1, 2, and 3 of this Section 14.2.4 are not met.

14.2.5 Receiving Water Limitations

1. The collection and conveyance facilities have been designed to collect Designated Contaminant Discharges and then convey this AMD from the Boulder and Slickrock Creek drainages to the MFTP. Bypass or leakage from these collection and/or conveyance facilities or a change in the underground mine workings that results in Designated Contaminant Discharges bypassing collection facilities into Boulder Creek and/or Slickrock Creek can significantly increase the discharge of metals from the Site. The Site Operator shall respond to these conditions if they occur. To detect such bypasses or leakage, the Site Operator shall conduct routine monitoring at the mouth of Boulder Creek (BCMO) and the mouth of Slickrock Creek (SRMO).

2. The concentration and loading of selected metals at BCMO at different flows from Jan 5, 2001, through August 31, 2008, are summarized in Table 14-3 and Figure 14-1 (Rule Curve) (end of text). These data shall be used as a background to detect noticeable increases in metals that would indicate bypass or leakage of Designated Contaminant Discharges.

TABLE 14-3
Mouth of Boulder Creek Maximum Metal Concentrations
Iron Mountain Mine Statement of Work

Flow Range (cfs)	Total Copper (µg/L)	Total Zinc (µg/L)
< 25	1,800	13,000
25 – 100	600	1,300
> 100	500	1,000

Maximum metal concentrations derived from Figure 14-1

3. If monitoring at BCMO indicates a significant increase in concentration or loading (the amount of which will be defined in the O&M Plan) at similar flows, then the Site Operator shall, at a minimum, take the following steps:

   a. Notify the Oversight Agency and Support Agency within seventy-two (72) hours.

   b. Inspect the conveyance system to determine if bypass or leakage of Designated Contaminant Discharges is occurring. If the Site Operator determines that the conveyance system is bypassing or leaking Designated Contaminant Discharges, the Site Operator shall make the necessary repairs promptly.

   c. Inspect the collection system to determine if all Designated Contaminant Discharges are entering the collection system at the points of collection in the mine workings. If it is determined that a portion of the Designated Contaminant Discharges is bypassing the collection system, the Site Operator shall make necessary repairs promptly.

   d. If inspections outlined in Subparagraphs (b) and (c) above do not reveal the source of the AMD increase at BCMO, then the Site Operator shall conduct a stream survey (six grab samples) of Boulder Creek, utilizing discrete sampling for selected metals (copper and zinc) to detect the stream section(s) where additional, new discharges or

Designated Contaminant Discharges may be occurring. For each such section, the Site Operator shall, to the extent practicable, determine the source of the discharge.

e. If the Site Operator or the Oversight Agency identifies Designated Contaminant Discharges entering Boulder Creek, the Site Operator shall provide a Work Plan, if required by the Oversight Agency, to the Oversight Agency and Support Agency identifying discharge areas and outlining the steps to be taken or collect the Designated Contaminant Discharges. Upon approval of the Work Plan by the Oversight Agency, the Site Operator shall implement the Work promptly.

f. If the inspections outlined in Subparagraphs (b) or (c) above, or the survey outlined in Subparagraph (d) above, do not reveal bypass or leakage or sources of the AMD increase related to the Designated Contaminant Discharges, the Site Operator shall conclude its investigation and document this finding in a report to the Oversight Agency.

4. If monitoring at SRMO indicates a significant increase in concentration or loading at similar flows (the amount of which will be defined in the O&M Plan), then the Site Operator shall, at a minimum, take the following steps:

   a. Notify the Oversight Agency and Support Agency within seventy-two (72) hours.

   b. Inspect the AMD conveyance system in the Brick Flat Pit area and below the Slickrock Creek Retention Reservoir to determine if bypass or leakage of Designated Contaminant Discharge is occurring. If it is determined that the conveyance system is bypassing or leaking the Designated Contaminant Discharges, the Site Operator shall make the necessary repairs promptly.

   c. Conduct a detailed inspection of the Slickrock Creek Dam face to determine if the Designated Contaminant Discharges are seeping into Slickrock Creek. If the Site Operator or Oversight Agency determines that Designated Contaminant Discharges are seeping into Slickrock Creek, the Site Operator shall provide a Work Plan, if required by the Oversight Agency, to the Oversight Agency and Support Agency identifying discharge area(s) and outlining the steps to be taken to restore or collect the Designated Contaminant Discharges. Upon approval of the Work Plan by the Oversight Agency, the Site Operator shall implement the Work promptly.

   d. If inspections outlined in Subparagraphs (b) and (c) above do not reveal the source of the AMD increase at SRMO, then the Site Operator shall conduct a stream survey (six grab samples) of Slickrock Creek, using discrete sampling for selected metals (copper and zinc) to detect the stream section(s) where additional, new, or Designated Contaminant Discharges may be occurring. For each such section, the Site Operator shall, to the extent practicable, determine the source of the discharge.

   e. If the Site Operator or the Oversight Agency identifies Designated Contaminant Discharges entering Slickrock Creek, the Site Operator shall provide a Work Plan to the Oversight Agency and Support Agency identifying discharge areas and outlining the steps to be taken or collect the Designated Contaminant Discharges. Upon approval of the Work Plan by the Oversight Agency, the Site Operator shall implement the work promptly.

f. If the inspections outlined in Subparagraphs (b) or (c) above or the survey outlined in Subparagraph (d) above, do not reveal bypass or leakage or sources of the AMD increase related to the Designated Contaminant Discharges, the Site Operator shall conclude its investigation and document this finding in a report to the Oversight Agency.

14.2.6 Long-term Performance Requirements

1. Long-term performance of the MFTP shall be measured by comparing thickener overflow effluent and effluent pump station discharge against the performance requirements listed in Tables 14-1 and 14-2. Thickener waste sludge performance shall be compared against the values listed in Table 14-4, but the values in Table 14-4 shall be operational targets only for long-term monitoring, not requirements.

TABLE 14-4
Thickener Waste Sludge Performance Requirements
Iron Mountain Mine Statement of Work

Parameter	Daily Minimum[a,c] (wt %)	30-Day Average[b,c] (wt %)
Thickener Underflow Solids	25	30
Filter Leaf Test Cake	40	50

[a] Minimum allowable for any one day, wt % = percent solids by weight.
[b] Average for 30 consecutive days, wt % = percent solids by weight.
[c] Except for periods of maintenance
Note: Thickener waste sludge is also known as thickener blowdown.

14.3 MFTP Monitoring and Reporting Requirements

14.3.1 Introduction

1. The Site Operator shall conduct analytical testing on samples collected at the MFTP to ensure that the treatment plant operational Performance Standards are met.

14.3.2 MFTP AMD Influent Monitoring Requirements

1. The Site Operator shall test the MFTP AMD influent for the water quality parameters listed in Table 14-5. The Site Operator shall use an automated composite sampler to collect influent samples. The Site Operator shall report the test results monthly for the previous month.

2. The Site Operator shall continuously measure (minimum of one measurement per hour) contributing flow from each of the Designated Contaminant Discharges (the Richmond Portal, the Lawson Portal, the Old/No. 8 Mine Seep, and the SCRR) plus the combined influent flow from all sources, and shall report the contributing flow monthly for the previous month.

3. The Site Operator shall measure combined influent flow at the MFTP influent flowmeter. The Site Operator shall compare the results of this measurement with the sum of the flow measurements from the Richmond, Lawson, and Old/No. 8 Mine workings, and SCRR described in Paragraph 2 of this Section 14.3.2.

4. In addition to the items listed in this Section, the Site Operator shall record daily (twenty-four [24]-hour) rainfall at the MFTP. The measurements shall be reported in the Monthly Progress Reports and compiled in the Site database.

TABLE 14-5

Water Quality Sampling and Test Requirements for MFTP Monitoring
Iron Mountain Mine Statement of Work

Water Quality Parameter	Reporting Units	AMD Influent	Thickener Overflow	Thickener Waste Sludge	Filtrate Pump Station	Sludge Drying Beds Sludge
pH	pH Units	C,D	C,D		C,W	
TSS	mg/L	C, W	C,D		C,W	
Total Copper, Total Cadmium, and Total Zinc	µg/L	C,D	C,D		C,W	
Dissolved Copper, Dissolved Cadmium, and Dissolved Zinc	µg/L		C,D		C,W	
Percent Solids	% by weight			G,D[a]		-- [b]
Solids Specific Gravity	S.G.			G,D[a]		-- [b]
Bulk Density	lb/cu ft			N/A		-- [b]
Filter Leaf Cake Percent Solids	% by weight			G,D[a]		
TCLP Metals	mg/L			G, [c,e]		-- [d]
Title 22-TTLC Metals	mg/kg			G, [c,e]		-- [d]
Cal/WET-STLC-Citrate Metals	mg/L			G, [c,e]		-- [d]
Lime Demand	lb/1,000 gal	C [e]				
Solids Formed	lb/1,000 gal	C [e]				
Flow	gpm	CN			CN	
Volume	cubic yards			D		

[a] Daily when sludge wasting occurs.

[b] Six samples from each sludge drying bed shall be collected during excavation. The samples shall be taken at points distributed throughout the bed volume to provide information about the vertical and horizontal solids distribution.

[c] Test performed on filter leaf cake.

[d] One composite sample from each bed composited from the six samples.

[e] As requested by the Oversight Agency.

Notes:

TSS = Total Suspended Solids.
TTLC = Total Threshold Limit Concentration.
Cal/WET = California Waste Extraction Test
C = 24-Hour Composite.
G = Grab Sample.
W = Weekly.
MO = Monthly Sampling.
TCLP = Toxicity Characteristics Leaching Procedure.
STLC = Soluble Threshold Limit Concentration
gpm = gallons per minute
CN = Continuous Measurement (hourly recording).
D = Daily Measurement.
B = Every 2 weeks.

14.3.3 Effluent Monitoring Requirements

1. The operation of the treatment plant shall include monitoring and reporting that meets the substantive requirements of an NPDES discharge permit. The thickener overflow and the effluent pump station discharge are the sample locations to be tested for the discharge permit requirements. The parameters that are relevant to the discharge requirements are pH, TSS, total copper, total cadmium, and total zinc.

2. The Site Operator shall sample and test daily (twenty-four [24]-hour composite samples) the thickener overflow and shall report the test results monthly for the previous month. The Site Operator shall sample and test weekly (twenty-four [24]-hour composite samples) the effluent pump station discharge and shall report the test results monthly for the previous month. The specific discharge limitations that apply are listed above in Table 14-2.

3. The Site Operator shall sample daily and test weekly (twenty-four [24]-hour composite samples) the thickener overflow for the water quality parameters listed in Table 14-5. The Site Operator shall sample and test weekly (twenty-four [24]-hour composite samples) the effluent pump station discharge for the water quality parameters listed in Table 14-5. Samples shall be collected using an automated composite sampler. The Site Operator shall report the test results monthly for the previous month.

4. Measurement of lime demand or solids formed is not required on a routine basis. However, the Site Operator shall measure lime demand and solids formed if requested by the Oversight Agency.

5. The Site Operator shall monitor Flat Creek at the Flat Creek Bridge to determine if industrial stormwater requirements are substantively met.

6. If the Site Operator or the Oversight Agency observes an increase in metal concentrations in Flat Creek at Flat Creek Bridge, the Site Operator shall inform the Oversight Agency and the Support Agency and take appropriate measures to respond to such increases consistent with this SOW. The Site Operator shall respond to a copper concentration of 60 µg/L on an interim basis until such time that the RWQCB completes remediation efforts at upstream locations in Upper Spring Creek. After the RWQCB completes work in Upper Spring Creek, the Oversight Agency shall revise the target concentration required for the Site Operator response.

14.3.4 Thickener Waste Sludge Monitoring Requirements

1. Sludge performance is monitored by sampling and testing thickener underflow (waste sludge) discharged to the sludge drying beds. The sample shall be a grab sample collected from the sludge sample port on the sludge recycle pipeline.

2. The Site Operator shall record daily the volume of sludge discharged to the sludge drying beds and shall report the volume monthly for the previous month.

3. The collection and testing of sludge samples for metals toxicity is not a required on a routine basis. The Site Operator shall collect thickener sludge samples from the sludge drying beds during when requested by the Oversight Agency. The Site Operator shall test the samples for metals toxicity as follows:

a. Samples shall be extracted using the Toxicity Characteristic Leaching Procedure (TCLP), and the resulting extract shall be tested for TCLP-regulated metals.

b. Total concentrations shall be determined for metals with regulated Total Threshold Limit Concentrations (TTLC). If the total concentration for any metal(s) equals or exceeds the Soluble Threshold Limit Concentration (STLC), but does not exceed the TTLC limit, the California Waste Extraction Test (Cal/WET) shall be performed using sodium citrate as the extractant. The resulting STLC extract shall be analyzed for that metal or metals. The Site Operator shall report these results in the Monthly Progress Report in the month following the testing and in the annual LMRP.

4. The Site Operator shall measure daily (or whenever sludge wasting takes place) the percent solids, solids specific gravity, and bulk density by weight of sludge discharged to the drying beds, and shall report these data monthly for the previous month.

5. The Site Operator shall measure daily (or whenever sludge wasting occurs) filter leaf cake percent solids by weight of the sludge sent to the drying beds, and shall report these data monthly for the previous month.

6. To evaluate sludge oxidation and blower efficiency, a grab sample of sludge will be obtained from the sludge recycle line at the beginning of each shift and compared to the Munsell color chart, with the target color categorized as Yellow-Red (5YR tab) with a value greater than or equal to 3/ and Chroma greater than or equal to /4. The color observation shall be recorded immediately after the sample is collected and documented in the shift forms.

14.3.5 Sludge Drying Beds Monitoring Requirements

1. The Site Operator shall collect six samples from each sludge drying bed during the excavation for sludge haulage. The samples shall be taken at points distributed throughout the bed volume to provide information about the vertical and horizontal distribution of material properties. The Site Operator shall test each sample for percent solids, solids specific gravity, and bulk density. The results of the analysis shall be reported the month following the sludge drying bed excavation and in the LMRP.

2. An equal portion of the six samples obtained from each sludge drying bed during the sludge drying bed excavation shall be composited and shall be tested for TCLP, TTLC, and STLC metals as described above in Section 14.3.4, *Thickener Waste Sludge Monitoring Requirements*.

14.4 Onsite Sample Locations and Testing

14.4.1 Introduction

1. The Site Operator shall conduct analytical testing on samples collected at various onsite locations to ensure that other components of the IMM Remedy are functioning in accordance with the requirements of this SOW and the Project Performance Standards. The sampling locations, sampling frequency, and sample test parameters for the Site monitoring locations are listed in Table 14-6. All onsite samples shall be collected on the same day. For all samples, the analytical test data and the flow measurements shall be reported the month following the sample collection.

14.4.2 Portals

1. The Site Operator shall collect grab samples weekly at the Richmond portal main (RPM), the Richmond portal floor drainage (RPF), the Lawson portal (LP), the Old/No. 8 Mine Seep (ON8), and the SCRR valve vault, and shall test these samples for pH, total copper, and total zinc. The Site Operator shall collect the samples at the grit chamber inflow locations at each portal. The Site Operator shall sample and test both the Richmond floor and the Richmond main at the Richmond grit chambers. The Site Operator shall report the results of analytical testing the month following the sample collection. The flows shall be reported in gallons per minute (gpm).
2. At the time of sampling, the Site Operator shall record the instantaneous flow out of the grit chambers and shall report these flows the month following the sample collection.

TABLE 14-6
Sampling and Test Requirements for Onsite Monitoring
Iron Mountain Mine Statement of Work

Parameter	Reporting Units	Portals [a]	Stream Sampling [b]	BCMO [c]	LACED [d]
pH	pH Units	G,W	G,W	C,D	G,B
Total Copper and Total Zinc	µg/L	G,W	G,W	C,D	G,B
Total and Dissolved Cadmium	µg/L			G,Q	
Dissolved Copper and Dissolved Zinc [e]	µg/L		G,W	C,D	G,B
Rainfall	Inches			CN	
Flow	gpm/cfs	CN,D		CN,D	W

[a] Portal sampling includes the Richmond portal, Richmond floor, the Lawson portal, and Old/No. 8/ SCRR.

[b] Locations for stream sampling include Mouth of Slickrock Creek and Flat Creek (at Flat Creek Bridge).

[c] BCMO is another stream sampling location, the mouth of Boulder Creek. It is shown separately because a daily composite sample is required. A minimum of weekly laboratory analytical testing of daily composite samples is required.

[d] LACED is the left abutment conveyance energy dissipater located just upstream of the SCRR sediment basin.

[e] Dissolved copper and zinc for Mouth of Slickrock Creek stream samples was terminated after 5 years following completion of the SCRR.

Notes:

C	=	24-Hour Composite.	CN	=	Continuous Measurement (hourly recording).
G	=	Grab Sample.	D	=	Daily Measurement.
W	=	Weekly.	B	=	Every 2 weeks.
cfs	=	Cubic feet per second.	gpm	=	Gallons per minute.
Q	=	Quarterly.			

3. The Site Operator shall continuously measure (minimum of one measurement per hour) flow from the Richmond portal main, Richmond portal floor drainage, the Lawson portal, and the Old/No. 8. Mine Seep. The Site Operator shall provide hourly flow measurements electronically to the Oversight Agency for the previous month. The Site Operator shall compute and report the average daily flow on the basis of the hourly flow measurements.

14.4.3 Stream Samples

1. Grab samples shall be collected weekly at the Mouth of Slickrock Creek Weir (SRMO) and at Flat Creek (at Flat Creek Bridge). The samples shall be tested for pH, total copper, and total zinc. Due to unsafe access and associated health and safety concerns, sampling at SCWIR is suspended. EPA may request sampling in the future with adequate notice.

2. For the first 5 years following completion of the SCRR and treatment of the SCRR flow, all stream samples were tested for dissolved copper, and dissolved zinc. Dissolved copper and zinc for Mouth of Slickrock Creek stream samples were terminated after five years following completion of the SCRR (June 2009) in accordance with the October 2, 2000, *Statement of Work, Site Operations and Maintenance, Iron Mountain Mine, Shasta County, California.*

14.4.4 BCMO Samples

1. The Site Operator shall collect daily composite samples at the Mouth of Boulder Creek Weir (BCMO) and shall test these samples for pH, total and dissolved copper, total and dissolved zinc, and on a quarterly basis, total and dissolved cadmium. Rainfall shall be recorded hourly. Hourly rainfall measurements and twenty-four (24)-hour total rainfall shall be included in the Site database. The Site Operator shall report twenty-four (24)-hour rainfall totals in the Monthly Progress Reports.

2. The Site Operator shall continuously measure (minimum of one measurement per hour) the flow at the calibrated weir at BCMO. The Site Operator shall maintain the calibration of the weir consistent with Section 9.14(5) (Sampling Program). The Site Operator shall provide hourly flow measurements electronically to the Oversight Agency with the Monthly Progress Reports for the previous month. The Site Operator shall compute and report the average daily flow on the basis of the hourly flow measurements.

14.4.5 LACED Samples

1. The Site Operator shall collect a grab sample every 2 weeks from the left abutment conveyance energy dissipater (LACED) and shall test these samples for pH, total and dissolved copper, and total and dissolved zinc.

2. In accordance with the October 2, 2000, *Statement of Work, Site Operations and Maintenance, Iron Mountain Mine, Shasta County, California,* sampling at the Brick Flat Pit seep (BFP8L) and Brick Flat Pit filtrate (BFP8R) sampling locations at the mouth of Brick Flat Pit are no longer required.

14.5 Sampling Procedures

1. This section presents sampling procedures for collection, containers and preservation methods, labeling and logging procedures, shipping procedures, and disposal procedures.

14.5.1 Sample Collection Procedures

14.5.1.1 AMD Influent

1. The Site Operator shall collect the AMD influent samples from the automated composite sampler. The automated composite sampler should be programmed to collect 4 liters of sample, with 80 milliliters (mL) collected every thirty (30) minutes. Preferably, the Site Operator shall use a single new container each twenty-four (24) hours. If the Site Operator does not use a new container, the Site Operator shall use a container thoroughly rinsed with deionized water.
2. The Site Operator shall split the 4-liter sample into two 125-milliliter portions using new sample containers. The Site Operator shall use one container for metals analysis and pH, and the other shall be retained as a duplicate onsite.
3. The Site Operator shall preserve the sample bottle according to guidelines provided in Table 14-7, and send the samples to an offsite laboratory following the sample shipping procedures described in Section 14.5.4. The Site Operator shall record the information in the sample log book as described in Section 14.5.3.2, *Sample Log Book Procedures.*

TABLE 14-7
Sampling Collection Methods
Iron Mountain Mine Statement of Work

Parameter	Reporting Units	Analysis Method	Preservation Methods	Analytical Holding Time	Sampling Containers (minimum size)
pH	pH units	SM2320-H^+ B[a]	Cool to 4°C Unpreserved	Analyze Immediately	4-ounce plastic (250 mL P/G)
TSS	mg/L	SM2540 D[a]	Cool to 4°C	7 days	1-liter plastic (250- mL P/G)
Total Copper, Total Cadmium, and Total Zinc	µg/L	--[b]	Cool to 4°C HNO_3 pH <2	6 months	1-liter plastic (250-mL)
Dissolved Copper, Dissolved Cadmium, and Dissolved Zinc	µg/L	--b	Filter cool to 4°C HNO_3, pH <2	6 months	1-liter plastic (250-mL)
Percent Solids	Wt %	SM2540 E[a]	Cool, 4°C	7 days	1-liter plastic (250 mL P/G)
Filter Leaf Cake Percent Solids	Wt %	Analysis included in Section 14.10.2	Cool, 4°C	7 days	500-mL wide-mouth (P/G)
TCLP Metals	mg/L	Extraction by SW1311 [b] Analysis by SW6010/7000 [b]	Cool, 4°C (Extract)	6 Months	8 oz. P/G
Title 22-TTLC Metals	mg/kg	SW6010/7000 [b]	Cool, 4°C	6 months	8-oz P/G
Cal/WET-STLC-Citrate Metals [c]	mg/L	Extraction by California Code of Regulations Title 22 WET Analysis by SW6010/7000 [b]	Cool, 4°C	6 months	8-oz P/G

TABLE 14-7
Sampling Collection Methods
Iron Mountain Mine Statement of Work

Parameter	Reporting Units	Analysis Method	Preservation Methods	Analytical Holding Time	Sampling Containers (minimum size)
Lime Demand [e]	lb/1,000 gal	Titration [d]	Cool, 4°C	7 days	1-liter plastic
Solids Formed [e]	lb/1,000 gal	Titration [d]	Cool, 4°C	7 days	1-liter plastic

[a] Standard Methods for the Examination of Water and Wastewater, latest edition.
[b] Test methods for Evaluating Solid Waste, SW846, Third Edition, latest update.
[c] Cal/WET-STLC to be performed only when total concentration equals or exceeds STLC but does not exceed TTLC.
[d] Analytical procedures are included in Section 14.10.
[e] To be performed if requested by Oversight Agency.
Note: P/G = polyethylene or glass container.

4. Preferably, the Site Operator shall perform the pH tests immediately in the plant laboratory. If the testing cannot be performed immediately, the Site Operator shall preserve the sample according to guidelines provided in Table 14-7. If the samples must be sent to an outside laboratory, the Site Operator shall follow the sample shipping procedures in Section 14.5.4 and provide holding times in the analytical data reports.

14.5.1.2 Thickener Overflow

1. The Site Operator shall collect the thickener overflow samples from the automated composite sampler. The automated composite sampler shall be programmed to collect 3 liters of sample, with 60 milliliters collected every 30 minutes. The Site Operator shall use a single new container each twenty-four (24) hours.
2. The Site Operator shall thoroughly mix the composite sample by shaking the composite sample container multiple times prior to filling sample bottles.
3. When duplicate analyses are to be performed, the Site Operator shall split the 3-liter sample into six 500-mL portions using new sample containers. The Site Operator shall use two 500-mL portions for metals analysis, and one for pH and TSS testing, and use the third and fourth portions for any duplicates needed.
4. The Site Operator shall preserve the metals sample bottle according to guidelines provided in Table 14-7, and shall send the samples to the laboratory following the sample shipping procedures provided in Section 14.5.4.
5. The Site Operator shall record the information in the sample log book as described in Section 14.5.3.2, *Sample Log Book Procedures.*
6. Preferably, the Site Operator shall perform the pH and TSS tests immediately in the plant laboratory. If they cannot be performed immediately, the Site Operator shall preserve the sample according to guidelines provided in Table 14-7. If they must be sent to an outside laboratory, the Site Operator shall follow the sample shipping procedures provided in Section 14.5.4.

14.5.1.3 Thickener Waste Sludge

1. The Site Operator shall collect the thickener waste sludge samples from the sample port. The Site Operator shall collect sufficient volume for the test requirements according to guidelines provided in Table 14-7. When only percent solids and the filter leaf cake percent solids tests are to be performed, the Site Operator shall collect 1 liter when duplicate analyses are not done, and 2 liters when duplicate analyses are done. When the TCLP, TTLC, and STLC-Citrate analyses are to be performed, the Site Operator shall collect an additional 2 liters when duplicate analyses are not done, and an additional 4 liters when duplicate analyses are done.

2. The Site Operator shall perform filter leaf dewatering of the sludge samples to generate the amount of sample needed, and preserve the samples for TCLP, TTLC, and STLC-Citrate analyses according to guidelines provided in Table 14-7, and send to the laboratory following the sample shipping procedures in Section 14.5.4.

3. The Site Operator shall record the information in the sample log book as described in Section 14.5.3.2, *Sample Log Book Procedures.*

4. Preferably, the Site Operator shall perform the percent solids and filter leaf cake percent solids tests immediately in the plant laboratory. If they cannot be performed immediately, the Site Operator shall preserve the sample according to guidelines provided in Table 14-7. If they must be sent to an outside laboratory, the Site Operator shall follow the sample shipping procedures in Section 14.5.4.

14.5.1.4 Sludge Drying Bed Filtrate

1. The Site Operator shall collect the sludge drying bed filtrate samples from the automated composite sampler at the sludge drying bed filtrate sump. The sampler should be programmed to collect 3 liters of sample, with 60 milliliters collected every thirty (30) minutes. A single new container should be used for each twenty-four (24)-hour sample.

2. When duplicate analyses are to be performed, the Site Operator shall split the 3-liter sample into six 500-mL portions using new sample containers. The Site Operator shall use two 500-mL portions for metals analysis, and one for pH and TSS testing. The Site Operator shall use the other portions for any duplicates needed.

3. The Site Operator shall preserve the metals sample bottle according to guidelines provided in Table 14-7 and send the samples to the laboratory following the sample shipping procedures provided in Section 14.5.4.

4. The Site Operator shall record the information in the sample log book as described in Section 14.5.3.2, *Sample Log Book Procedures.*

5. Preferably, the Site Operator shall perform the pH test immediately in the plant laboratory. If the pH cannot be measured immediately, the Site Operator shall preserve the sample according to guidelines provided in Table 14-7. If the samples must be sent to an outside laboratory, the Site Operator shall follow the sample shipping procedures provided in Section 14.5.4.

14.5.1.5 Sludge Drying Bed Sludge

1. The Site Operator shall collect the sludge drying bed sludge samples from the sludge drying beds when they are being excavated. The Site Operator shall collect six samples from each bed taken at points distributed throughout the bed volume to provide information about the vertical and horizontal distribution. At each of the six locations, the Site Operator shall collect 500 mL of sludge. From three of the locations, the Site Operator shall collect an additional liter of sludge for the TCLP, TTLC, and STLC-Citrate tests. The Site Operator shall collect additional samples for any duplicates required.

2. The Site Operator shall preserve the samples for TCLP, TTLC, and STLC-Citrate analyses according to guidelines provided in Table 14-7, and send to the laboratory following the sample shipping procedures in Section 14.5.4.

3. The Site Operator shall record the information in the sample log book as described in Section 14.5.3.2, *Sample Log Book Procedures.*

4. Preferably, the Site Operator shall perform the percent solids tests immediately in the plant laboratory. If the test cannot be performed immediately, the Site Operator shall preserve the sample according to guidelines provided in Table 14-7. If the samples must be sent to an outside laboratory, the Site Operator shall follow the sample shipping procedures provided in Section 14.5.4.

14.5.2 Sample Containers and Preservation

1. The Site Operator shall refer to Table 14-7 for the sample containers and the preservation procedures required for each sample. The Site Operator shall use new sample containers, except for the influent sample collection container that can be reused if rinsed thoroughly with deionized water.

14.5.3 Sample Labeling and Logging

14.5.3.1 Sample Labels

1. Each sample shall be labeled using a stick-on label. The label shall be filled out in indelible ink and shall contain the following information:

   a. Date collected;
   b. Time collected;
   c. Sampler's name;
   d. Unique identification code; and
   e. Analyses to be performed.

14.5.3.2 Sample Log Book Procedures

1. In general, the Site Operator may rely on and implement the current format used for the log book to the extent that it is consistent with this SOW.

2. A bound sample log book shall be maintained at the treatment plant laboratory. The log book shall be used to record each sample collected. Indelible ink shall be used. The following information shall be written into the log book for each sample collected:

   a. Date collected;

b. Time collected;
c. Sampler's name;
d. Unique identification code;
e. Analyses to be performed;
f. Notes or observations concerning the samples;
g. Notation if duplicates were collected;
h. Notation if samples were split for use by other entities ; and
i. Sample shipping information (laboratory shipped to, courier identification, bill of lading number).

3. If an error is made, the Site Operator shall strike the error using a single line, and initial and date the strikeout.

14.5.4 Sample Shipping Procedures

1. When samples are transported offsite for analysis, the packing, chain-of-custody, and shipping procedures listed below shall be used.

14.5.4.1 Sample Packing

1. The samples shall be clean and labeled. The labeling shall be as described in the labeling procedure section. The samples shall be placed in a cooler with bagged ice or frozen "blue ice"-type coolant. The samples shall be protected from breaking by packing with foam packing pellets if necessary, or a suitable substitute.

2. If the cooler is to be shipped by a third-party carrier (such as Federal Express, United Parcel Service, or a local delivery service), a completed chain-of-custody (COC) form shall be placed in a plastic zip-type bag and placed on top of the packing pellets. The cooler shall be taped shut with strapping tape and sealed with a custody seal on the front and on the back of the lid. The custody seal shall be placed so that it shall be broken when the cooler is opened.

14.5.4.2 Chain-of-Custody

1. When samples are sent or transported to an offsite laboratory, a standard COC form shall be used. When transferring samples, the individuals relinquishing and receiving the samples shall sign, date, and note the time on the record. The COC form shall include the date and time the samples were taken, method of preservation, type of sample (composite or grab), matrix (soil/sludge or water), field identification number, analyses requested, and number of containers.

14.5.4.3 Shipping

1. Samples shall be shipped to arrive at the laboratory by noon the next business day.

14.5.5 Sample Disposal

1. All unused influent, effluent, and sludge sample portions shall be mixed with the influent at the treatment plant. The sample bottles shall be rinsed and placed in the garbage receptacle. The rinse solution shall be mixed with the influent at the plant.

14.6 Sample Results, Documentation, and Reporting

1. In general the Site Operator may rely on and implement the current formats for sheets, databases, reports, and electronic data to the extent that these are consistent with this SOW.

14.6.1 Onsite Testing Sheets

1. All onsite testing computations shall be performed on preprinted sheets specifically made for the test being performed. The sheet shall have labeled blanks for all necessary test values. The sheets shall also show the computational procedure used, along with all needed formulas. The sheets shall be prepared in a such way that someone unfamiliar with the test procedure can follow the calculations performed.

2. The sheets shall also contain the following information:

   a. Name of the test procedure;
   b. Date and time sample collected;
   c. Date and time test performed;
   d. Name of person performing the test;
   e. Test result; and
   f. Notes or observations pertaining to the sample or the test.

3. A separate file or notebook shall be used for each sample type (AMD influent, thickener overflow, thickener waste sludge, filtrate pump station, and sludge drying bed sludge). The testing sheets shall be filed by date of sample collection.

14.6.2 Offsite Laboratory Data Packages

1. Minimum documentation to be submitted by the laboratory shall include:

   a. Analytical results for each required parameter, including units and reporting limits (sludge results shall be based on wet weight);

   b. Sample field and laboratory identification numbers;

   c. Dates of sample collection, preparation, and analysis; and

   d. Chain-of-custody documentation.

2. All analytical records, including but not limited to calibration and quality control data, preparation and analysis logs, instrument printouts, manual calculations, and manual bench records shall be maintained on file by the laboratory for a period of at least 5 years. These records should be made available upon request during the archival period.

3. Copies of the laboratory data packages shall be kept on file at the plant site. The data packages shall be filed by sample type (AMD influent, thickener overflow, thickener waste sludge, filtrate pump station, and sludge drying bed sludge) and by date of sample collection. (Any data packages that apply to more than one sample type shall be filed as one sample type and cross-referenced in each other's sample type file location.)

14.6.3 Data Summaries

1. Data summaries for onsite data shall be prepared using a spreadsheet or s program capable of producing database or spreadsheet files in a format acceptable to the Oversight Agency. A separate database table for each sample type (AMD influent, thickener overflow, thickener waste sludge, filtrate pump station, and sludge drying bed sludge) shall be prepared. Tables shall be formatted for printing the sample results. Applicable performance requirements shall be shown on each table when applicable.

14.6.4 Reporting

1. Reporting shall be conducted according to the frequencies shown in Table 14-5. During the Short-term Monitoring Period, a single report shall be submitted to the Oversight Agency within 2 weeks of the completion of the 30-day performance evaluation period.

2. During Long-term Performance Monitoring, the reports shall be submitted to the Oversight Agency and other agencies designated by the Oversight Agency each month. These reports shall include both paper and electronic copies of the data summaries unless otherwise agreed by the Oversight Agency. The onsite data sheets and the laboratory data packages shall not be submitted, but shall be available if access is requested.

3. The Site Operator shall maintain an electronic database of sample, flow, and test data designated in Section 14.3 and Section 14.4. The electronic database shall contain sufficient information to fully characterize the sample and the results of analytical testing. The revised database shall be submitted monthly to the Oversight Agency. Each analytical database record shall contain, at a minimum, the following data:

    a. Location ID number;
    b. Laboratory ID number;
    c. Date sampled;
    d. Date of analysis;
    e. Analytical test method;
    f. Analyte;
    g. Results of analytical testing;
    h. Detection limits;
    i. Reporting units;
    j. Laboratory flags;
    k. Flow measurements; and
    l. Flow units.

4. The Site Operator shall propose the structure and software for maintaining the database in the O&M Plan. The software shall be a commercially available database program, acceptable to the Oversight Agency. The software shall be updated every 5 years, or more frequently at the option of the Site Operator. The Site Operator shall upload all archived data into the new software release version and annually provide the complete database to the Oversight Agency in a format acceptable to the Oversight Agency.

14.7 Data Quality Objectives for Measurement of Data

14.7.1 Components of Data Quality Objectives

1. The data quality assurance (QA) objective is to develop and implement procedures that shall provide data of known and appropriate quality. Data quality is assessed by the parameters of representativeness, comparability, accuracy, precision, and completeness. Definitions of these criteria, the applicable procedures, and level of effort are described below. The applicable quality control (QC) procedures, quantitative target limits, and levels of effort for assessing data quality are dictated by the intended use of the data and the nature of the analytical methods, as further described below.

2. Data quality objectives (DQOs) consist of quantitative specifications for the minimum quality of data that shall be permitted for use in a specific investigation. For treatment plant performance monitoring, the parameter analyses are designed to provide data adequate to evaluate the performance of the treatment plant to determine if it is meeting the performance requirements. DQOs for each of the analytical parameters were selected by consideration of specific uses/decisions, users, and regulatory requirements (U.S. EPA, Region IX, *Guidance for Preparing Quality Assurance Project Plans for Superfund Remedial Projects*, Document Control No. 9QA-03-89, September 1989).

3. Uses/decisions, users, applicable regulatory detection limit requirements, appropriate detection limits, and appropriate analytical quality levels for planned analysis are listed in Table 14-8. Appropriate detection limits are identified in accordance with regulatory and technical requirements as well as analytical method limitations. For parameters with no regulatory limitations, detection limits have been identified as appropriate for the data uses. For parameters for which more than one usage has been identified, the analytical quality level is based on the usage that requires the highest level.

4. During analysis conducted on a field sample, the detection limits may be elevated because of interference from other components in the matrix and modified by the laboratory.

5. Table 14-9 summarizes the quantitative DQOs and the specific analytical method, target detection limit, accuracy, precision, and completeness are listed for each constituent.

6. Following is a discussion of detection limits, representativeness, comparability, accuracy, precision, and completeness.

14.7.1.1 Representativeness

1. Representativeness describes the degree to which the data accurately and precisely represent the parameter being measured.

14.7.1.2 Comparability

1. Comparability expresses the confidence that one set of data can be compared to another. Comparability of the data shall be maintained by using EPA-defined procedures where available. Data comparability shall be maintained by use of consistent methods and consistent units. Specific analysis criteria and applicable methods for analytes and target detection limits have been established (see Table 14-9).

14.7.1.3 Accuracy

1. Accuracy is the closeness of the measured value to the true value. Accuracy of chemical test results is often assessed by spiking samples (referred to as matrix spikes) or analyte-free matrix, i.e., deionized water or Ottawa sand (referred to as laboratory control samples or blank spikes) with analytes of known concentrations and determining the recovery. Where applicable, USEPA Contract Laboratory Program spiking levels shall be used.

TABLE 14-8
Data Uses and Quality
Iron Mountain Mine Statement of Work

Parameters	Uses/Decisions/ Computations	Users	Applicable Regulatory Limits	Appropriate Detection Limits
Solids Formed	Sludge volume. Solids recycle ratio.	Process engineers Plant operators	None	10 mg/L
Lime Demand	Lime consumption. Lime delivery needs.	Process engineers Plant operators	None	10 mg/L
pH	Influent acidity. Plant instrumentation. Process pH control.	Process engineers Plant operators Regulators	None	N/A
Total Metals: Copper, Cadmium, and Zinc (aqueous)	Sludge leachability. AMD characteristics. Process performance. Collection/Conveyance	Process engineers Plant operators Regulators	Cu: 0.15 mg/L Cd: 0.05 mg/L Zn: 0.75 mg/L	Cu/Cd: 1 µg/L[a] Zn: 2 µg/L[a]
Dissolved Metals: Copper, Cadmium, and Zinc (aqueous)	Sludge leachability. AMD characteristics. Process performance.	Process engineers Plant operators Regulators	Cu: 5 µg/L Cd: 2 µg/L Zn: 100 µg/L	Cu: 1 µg/L Cd: 0.2 µg/L Zn: 2 µg/L
Percent Solids	Process performance.	Process engineers Plant operators	None	5 weight percent
Filter Leaf Cake Percent Solids	Process performance.	Process engineers Plant operators	None	5 weight percent
Total Metals: Copper, Cadmium, and Zinc (sludge)	Sludge characteristics.	Process engineers Plant operators Regulators	None	Cu: 25 mg/kg Cd: 10 mg/kg Zn: 50 mg/kg
TCLP/TTLC/ STLC Metals	Toxicity characteristics.	Process engineers Plant operators Regulators	TCLP/TTLC/ STLC limits	TCLP/STLC[b] TTLC: 5 mg/kg

[a] Samples of acid mine drainage (i.e., AMD Influent, Lawson Portal, Old Number 8/PW3, Richmond Floor, Richmond Portal, SCRR) will have higher total metal detection limits. The reporting limits and method detection limits for these samples shall be as low as feasible and less than the sample concentration within the matrix limitations.

[b] 10 times below STLC limit specified in Title 22, Chapter 11, Article 3. Table 2.

2. A quantitative definition of recovery (accuracy) is given in Section 14.8, Data Reduction, Reporting, and Evaluation. One matrix spike for metals per 20 samples of the same matrix shall be analyzed. At least one matrix spike shall be analyzed every 2 weeks on an influent sample and on an effluent sample. At least one laboratory control sample or blank spike per matrix shall be analyzed with each batch of no more than 20 samples. (See Table 14-8 for target analytical accuracy objectives.)

TABLE 14-9
Quality Assurance Objectives
Iron Mountain Mine Statement of Work

Parameter	Reporting Units	Analysis Method	Target Detection Limit	Analytical Accuracy [a]	Analytical Precision [b]	Overall Complete-ness
pH	pH units	SM2320-H^+ B[c]	N/A	N/A	± 0.10 pH unit	95
Total Suspended Solids	mg/L	SM2540 D[c]	10 mg/L	75 to 125	±20 or ±CRDL	95
Total Copper, Total Cadmium, and Total Zinc	µg/L	--[e]	Cu: 1 µg/L[f] Cd: 1 µg/L[f] Zn: 2 µg/L[f]	75 to 125	±20 or ±CRDL	95
Dissolved Copper, Dissolved Cadmium, and Dissolved Zinc	µg/L	--[e]	Cu: 1 µg/L Cd: 0.2 µg/L Zn: 2 µg/L	75 to 125	±20 or ±CRDL	95
Percent Solids	Wt %	SM2540 E[c]	5 wt %	N/A	±20 or ±Reporting Limit	95
Filter Leaf Cake Percent Solids	Wt %	--[d]	5 wt %	N/A	±20 or ±Reporting Limit	95
TCLP Metals	mg/L	Extraction by SW1311 [e] Analysis by SW6010/7000 [e]	0.010 mg/L	75 to 125	±20 or ±Reporting Limit	95
Title 22-TTLC Metals	mg/kg	SW6010/7000	5 mg/kg	75 to 125	±20 or ±Reporting Limit	95
Cal/WET-STLC-Citrate Metals (to be performed only when total concentration equals or exceeds STLC but does not exceed TTLC)	mg/L	Extraction by California Code of Regulations Title 22 WET Analysis by SW6010/7000 [e]	--g	75 to 125	±20 or ±Reporting Limit	95
Lime Demand	lb/1,000 gal	Titration[d]	10 mg/L	N/A	±20 or ±Reporting Limit	95
Solids Formed	lb/1,000 gal	Titration[d]	10 mg/L	N/A	±20 or ±Reporting Limit	95
Flow	gpm / cfs	Measurement	N/A	N/A	N/A	N/A
Volume	cy	Measurement	N/A	N/A	N/A	N/A

[a] Analytical Accuracy is measured as percent recovery.

[b] Analytical precision limits are ±20% RPD (relative percent difference) when the concentrations are ≥ 5 times the reporting limit (CRDL) or a difference of ± reporting limit between the duplicate results when the concentrations are < 5 times the reporting limit.

[c] Standard Methods for the Examination of Water and Wastewater, latest edition.

[d] These analytical procedures are included in Section 14.10.

[e] Test Methods for Evaluating Solid Waste, Third Edition, latest update.

[f] Samples of acid mine drainage (i.e., AMD Influent, Lawson Portal, Old Number 8/PW3, Richmond Floor, Richmond Portal, SCRR) will have higher total metal detection limits. The reporting limits and method detection limits for these samples shall be as low as feasible and less than the sample concentration within the matrix limitation.

[g] 10 times below STLC limit specified in Title 22, Chapter 11, Article 3. Table 2.

14.7.1.4 Precision

1. Precision of data is a measure of the spread of data when more than one measurement is taken from the same sample. For duplicate measurements, precision can be expressed as the relative percent difference. One duplicate measurement shall be performed on a 1-in-10 frequency for each analysis method per matrix. (See Table 14-9 for target analytical precision objectives.)

14.7.1.5 Completeness

1. Completeness is a measure of the amount of valid data obtained from the analytical measurement system compared with the amount expected. The target completeness objective shall be 95 percent. The actual completeness may vary, depending on the intrinsic nature of the samples. The completeness of the data shall be assessed during quality control reviews. For purposes of determining completeness the Site Operator's senior reviewer may rely on the laboratory field and quality control data.
2. Audits, internal quality control checks, preventive maintenance, and corrective action shall be implemented to maintain the QA objectives.

14.7.2 Calibration Procedures

14.7.2.1 Field Calibration Procedures

1. Field calibration measurements shall be conducted in the plant laboratory. The following standards shall apply:
   a. Calibration shall be performed prior to use according to the equipment manufacturer's recommendation or to established standard operating procedures.
   b. Calibrated equipment shall be uniquely identified by using either the manufacturer's serial number or other means. A label with the identification number and the due date of the next calibration shall be physically attached to the equipment. If this is not possible, records traceable to the equipment shall be readily available for reference. In addition, the results of calibrations and records of repairs shall be recorded in a log book.
   c. Scheduled periodic calibration of testing equipment does not relieve field personnel of the responsibility of employing properly functioning equipment. If an individual suspects an equipment malfunction, the device shall be removed from service, tagged so that it is not inadvertently used, and the appropriate personnel notified so that a recalibration can be performed or a substitute piece of equipment can be obtained.
   d. Equipment that fails calibration or becomes inoperable during use shall be removed from service and either segregated to prevent inadvertent use or tagged to indicate it is out of calibration. Such equipment shall be repaired and satisfactorily recalibrated. Equipment that cannot be repaired shall be replaced.
   e. Results of activities performed using equipment that has not been calibrated or that has failed calibration shall be documented and evaluated. If the activity results are

adversely affected, the results of the evaluation shall be documented and the appropriate personnel notified.

14.7.2.2 Laboratory Calibration Procedures

1. Laboratory calibration procedures are specified in the relevant methods for each constituent, as applicable. Where there are no specifications, the calibration procedures at a minimum shall be as follows:

   a. Initial calibration for all methods shall include a blank and at least three standards before a run. If the relative standard deviation (RSD) of the response factors is not more than 20 percent, the average response factors may be used for calculations. Otherwise, linear regressions must be used, and the coefficient of correlation must be at least 0.995.

   b. Continuing calibration for all methods shall include a mid-range calibration standard after every tenth sample. The standard must be recovered within 10 percent of the expected concentration.

14.7.3 Quality Control Procedures

14.7.3.1 Field Quality Control Procedures

1. Field sampling QC procedures shall include field duplicates. Field duplicates shall be collected at a 1-in-10 frequency and shall be collected for each analytical method.

14.7.3.2 Offsite Laboratory Quality Control Procedures

1. Laboratory services shall be provided by a laboratory certified under the Environmental Laboratory Accreditation Program (ELAP) of the California Department of Health Services. The ELAP certification shall cover the analyses required under this project.

2. Offsite laboratory quality control procedures shall include the following:

   a. Method-defined instrument calibrations and standards (Table 14-9);

   b. Analytical methodology according to listed methods (Table 14-9);

   c. Laboratory blank measurements as specified by the method or at a minimum 5 percent or one-per-batch frequency, whichever is more frequent, when appropriate;

   d. Matrix spikes at minimum 5 percent frequency, or as specified in Section 14.7.1.3 (2), or at a greater frequency depending on field observation of samples.

   e. At least one blank spike or laboratory control sample per matrix with each analytical batch of 20 or fewer samples;

   f. At least one set of laboratory duplicates per matrix with each analytical batch of 20 or fewer samples; and

   g. Data reduction and reporting according to listed methods.

3. Instrument maintenance log books shall be maintained in the onsite and offsite laboratories. The log books, in general, are to contain a schedule of maintenance as well as a complete history of maintenance, both routine and non-routine.

4. Preventive maintenance is to be performed according to the procedures delineated in the manufacturer's instrument manuals, including lubrication, source cleaning, detector cleaning, and the frequency of such maintenance. Precision and accuracy data are to be examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance shall be performed when an instrument begins to evidence degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the QC criteria.

5. Instrument downtime can be minimized by keeping adequate supplies of all expendable or long-lead-time items, where expendable means an expected lifetime of less than 1 year.

14.8 Data Reduction, Reporting, and Evaluation

14.8.1 Precision and Accuracy

1. The Site Operator shall conduct data reduction at the onsite or offsite laboratory as described in the specified methods. The Site Operator shall review all data for compliance with holding times and the calibration and QC requirements specified for each method.

2. The Site Operator shall compute accuracy and precision from spike and duplicate results using the formulas listed below. The calculated accuracy and precision shall be compared with the acceptance criteria listed in Table 14-9. Data not in compliance with the requirements specified for each method shall be flagged using qualifiers equivalent to the EPA CLP. All data shall be reviewed by a second independent analyst or supervisor prior to submission by the laboratory.

14.8.1.1 Precision

1. Precision is calculated from duplicate measurements:

$$RPD = \frac{(C_1 - C_2) \times 100\%}{(C_1 + C_2)/2}$$

Where:

RPD = relative percent difference
C_1 = larger of the two observed values
C_2 = smaller of the two observed values

2. If calculated from three or more replicates, use RSD rather than RPD:

$$RSD = (s/\bar{y}) \times 100\%$$

Where:

RSD = relative standard deviation
s = standard deviation

$\bar{y}$ = mean of replicate analyses

3. Standard deviation, s, is defined as follows:

$$s = \sqrt{\sum_{i=1}^{n} \frac{(y_i - \bar{y})^2}{n-1}}$$

Where:

s = standard deviation
y_i = measured value of the i^{th} replicate
$\bar{y}$ = mean of replicate measurements
n = number of replicates

14.8.1.2 Accuracy

1. For measurements where matrix spikes are used:

$$\%R = 100\% \times \left[\frac{S - U}{C_{sa}}\right]$$

Where:

%R = percent recovery
S = measured concentration in spiked aliquot
U = measured concentration in unspiked aliquot
C_{sa} = actual concentration of spike added

2. For situations where a standard reference material (SRM) is used instead of, or in addition, to matrix spikes:

$$\%R = 100\% \times \left[\frac{C_m}{C_{srm}}\right]$$

Where:

%R = percent recovery
C_m = measured concentration of SRM
C_{srm} = actual concentration of SRM

14.8.1.3 Data Evaluation

1. The Site Operator shall designate a qualified senior reviewer to provide a written review of all data received from the Site Operator's laboratories. Any discrepancies shall be resolved with the laboratories. The data and associated qualifiers shall then be entered into the IMM electronic database. The data usability will be based upon the results of the data review and the professional judgment of the data reviewer.

2. The Site Operator shall report the results in tabular format monthly to the Oversight Agency as described in Section 14.6.4. Deviations from the accuracy and precision criteria, as well as from the method-specified requirements, shall be noted according to

the qualifiers applied by the laboratory. The completeness value shall be calculated using the formula listed below. The results of the completeness calculation and data quality evaluation shall be summarized in the cover letter accompanying the Monthly Progress Report.

3. Completeness is defined as follows for all measurements:

$$\%C = 100\% \times \left[\frac{V}{n}\right]$$

Where:

%C	=	percent completeness
V	=	number of measurements judged valid (not rejected)
n	=	total number of measurements

14.9 Quality Assurance Oversight

14.9.1 Performance and System Audits

1. The Oversight Agency will implement and conduct audits of the QA procedures for sample/data collection. The Oversight Agency will implement audits to evaluate the execution of sample identification, sample control, chain-of-custody procedures, sample log notebooks, sampling procedures, and onsite or offsite laboratory measurements.

2. The Oversight Agency will audit onsite or offsite laboratories. The laboratory audits shall include analytical methodology QC procedures.

3. Verification of computer models and software (such as spreadsheets) will be conducted periodically by the Oversight Agency. Electronic and paper-based data sets should be verified by double entry, cross-checking, and range-checking against the known programs and models to check for correctness, reasonableness, and user competence.

14.9.2 Corrective Action

1. If QC audits result in detection of unacceptable conditions or data, the Site Operator shall develop and initiate corrective action. The Oversight Agency shall be notified if nonconformance is of program significance or requires special expertise not normally available to the project team. Corrective action may include:

   a. Reanalyzing samples if holding time criteria permit;
   b. Resampling and analyzing;
   c. Evaluating and amending sampling and analytical procedures;
   d. Accepting data acknowledging level of uncertainty; or
   e. Inserting Quality Assurance report section with changes.

14.10 Specific Analytical Methods for Iron Mountain Mine

14.10.1 Solids Formed and Lime Demand Test

1. Add 500 mL of AMD to a 1,000-mL beaker equipped with an overhead, prop-type (high shear) mixer.

2. Add 10 percent $Ca(OH)_2$ slurry (100 grams of $Ca(OH)_2$ added to about 800 mL of tap water and then diluted to approximately 1.0 liter) carefully until the pH remains stable at 10.0 (±0.1 unit) for at least one minute. Record the volume of 10 percent lime slurry added.

3. Filter 25 mL of the slurry through a tared Selas crucible, Gooch crucible, or fritted glass-bottomed crucible. A tared, 47-mm A/E glass fiber filter can be used if filter crucibles are not available.

4. Dry the crucible (or filter) overnight at 105 degrees C.

5. Cool and weigh the filter and determine the weight of solids.

6. Lime Demand equals:

   (mL 10% lime added x 0.2) = grams $Ca(OH)_2$/liter AMD

   (grams $Ca(OH)_2$/liter x 8.345) = lb $Ca(OH)_2$/1,000 gallons AMD

7. Solids Formed equals:

$$\frac{\text{(Solids wt, grams)} \times \text{(500 + volume of 10\% lime added)} \times 2}{25} =$$

   grams solids formed/liter AMD
   (grams solids formed/liter AMD) x 8.345 =
   lb solids formed/1,000 gallons AMD

14.10.2 Determination of Percent Solids by Filter Leaf Cake

1. Using a rubber stopper with a hole, attach a filter holder with a pre-weighed glass fiber filter to a 1-liter filtration flask with side arm for connecting to a vacuum line. Connect the filtration flask to the vacuum source with a rubber tubing.

2. Thoroughly mix the sludge to be tested with an agitator or stirring rod.

3. Dip out a quantity of the sludge into a beaker or equivalent container.

4. Turn on the vacuum to the filtration assembly.

5. Rapidly pour the sludge into the filter funnel.

6. Continue filtering until either the vacuum breaks or no more filtrate is produced.

7. Turn off the vacuum.

8. Remove the filter and cake from the filter funnel, and weigh.

9. Dry the filter and cake for at least an hour at 103-105°C.

10. Cool in a desiccator and weigh.

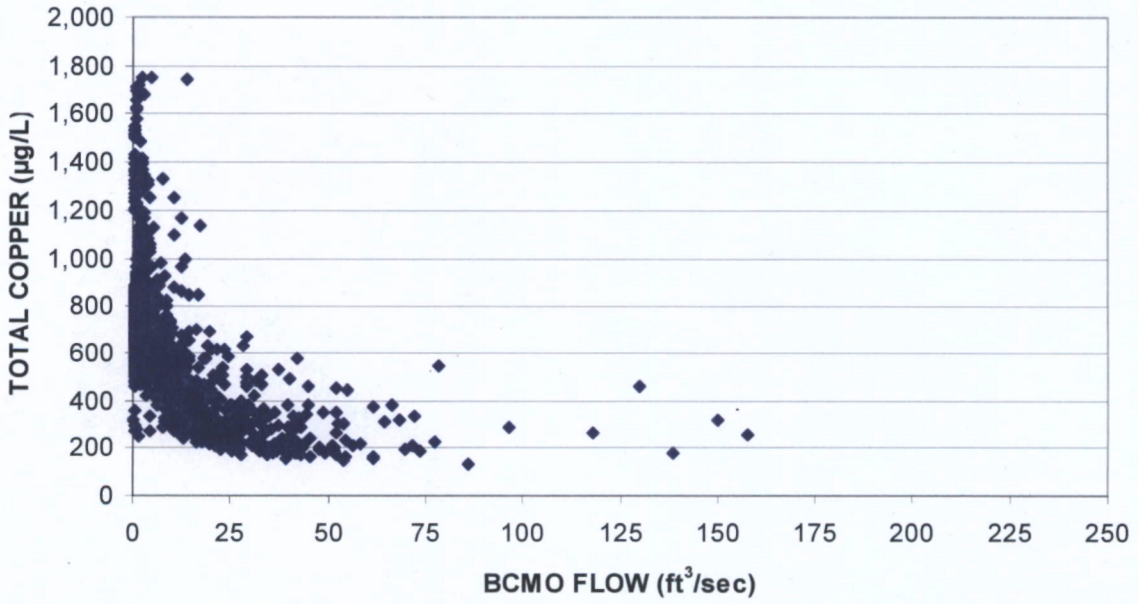
11. Repeat the cycle of drying at 103 to 105°C., cooling, desiccating, and weighing until a constant weight is obtained or until loss of weight is less than 4 percent of the previous weight, or 0.5 mg, whichever is less.

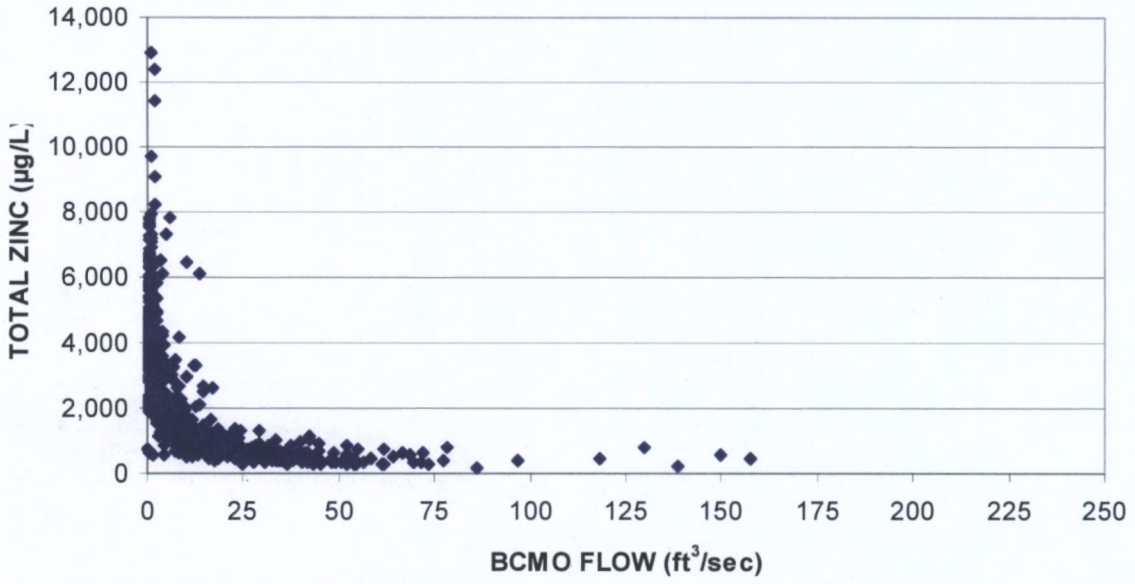
12. Calculate the percent solids of the cake:

$$\% \text{ Solids} = \frac{(A-B)(100)}{(C-B)}$$

Where:

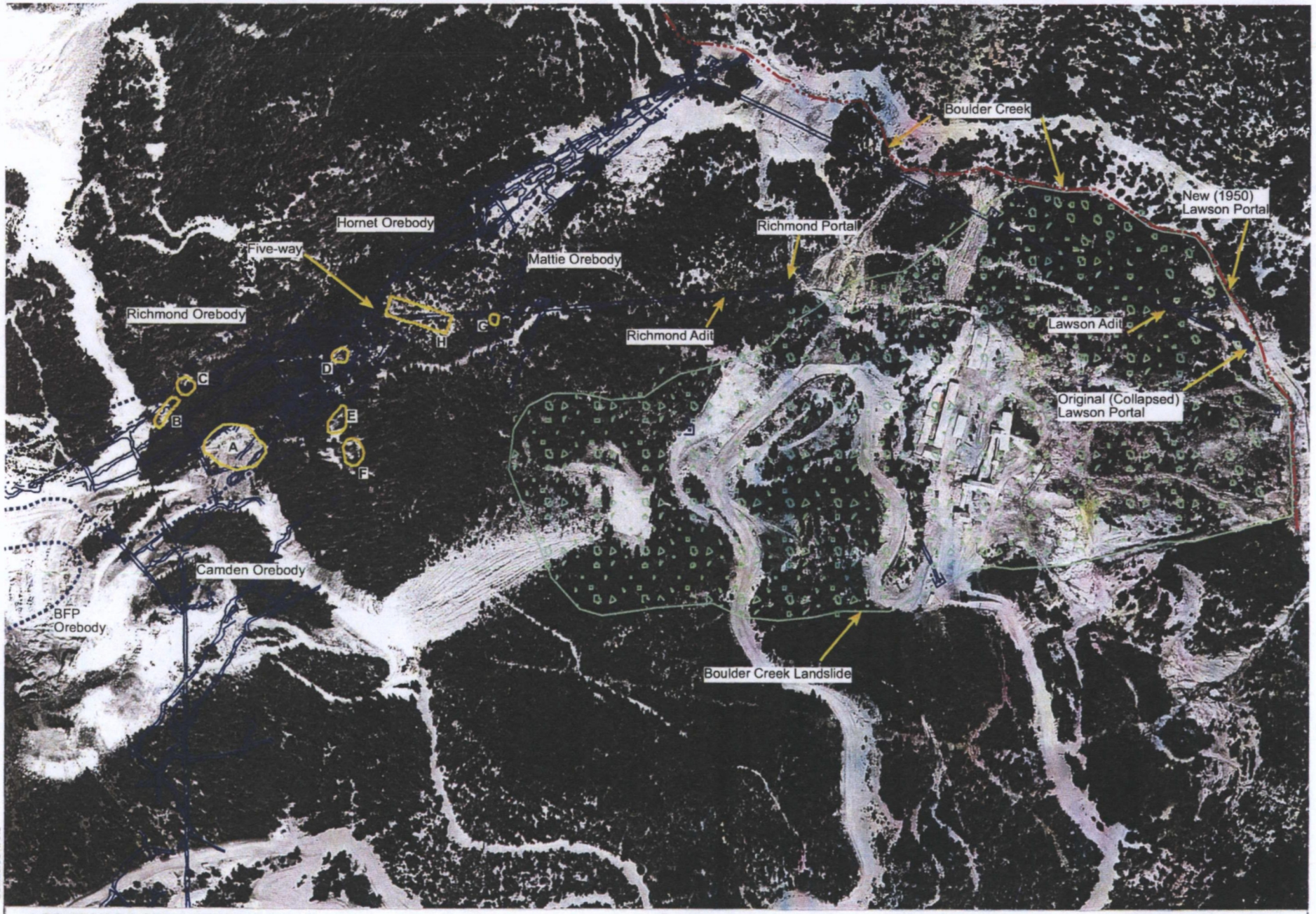
A = weight of filter + cake after drying
B = weight of filter
C = weight of filter + cake before drying





NOTES:
1. DATE RANGE IS JANUARY 2001 THROUGH AUGUST 2008.
2. ONLY DATA REPORTED BY THE SITE OPERATOR WERE USED.
3. DATA FROM THE RANGE FEBRUARY 1, 2002, THROUGH MARCH 21, 2002, WERE EXCLUDED BECAUSE THE SITE OPERATOR REPORTED THAT THE FLOW DATA FOR THIS PERIOD WERE UNRELIABLE.

FIGURE 14-1
TOTAL COPPER AND ZINC
MOUTH OF BOULDER CREEK
IRON MOUNTAIN MINE



Boulder001.FH8

LOCATION OF OREBODIES, PORTALS, AND BOULDER CREEK LANDSLIDE ESTIMATED FROM KINKEL,HALL AND ALPERS. U.S. GEOLOGIC SURVEY PAPER 285 PLATE 8 U.S. DEPARTMENT OF INTERIOR

0 200 400 FEET

SCALE APPROXIMATE
PHOTOGRAPHY 9/4/68

N

SUBSIDENCE ZONE
COLLAPSED PORTAL
OPEN PORTAL

PROJECTION OF OREBODY
MINEWORKINGS

PLATE 1
SUBSIDENCE ZONES
IRON MOUNTAIN MINE
SHASTA COUNY, CALIFORNIA

ATTACHMENT A

IMM ROD Components Not Implemented

ROD1

Component Selected in ROD (pp 64-65)	Component Implemented	O & M required SOW?
Up to 250 cfs of clean water to be diverted from the South Fork of Spring Creek across the drainage divide into Rock Creek, which discharges into the Sacramento River below Keswick Dam. The purpose of this alternative is similar to the Upper Spring Creek diversion and required a small diversion dam and 4,000 feet of pipeline to complete the conveyance of flows to Rock Creek.	This was not implemented.	No.
Spring Creek Debris Dam to be enlarged from its present storage capacity of 5,800 acre feet to 9,000 acre feet.	This component was not implemented.	No.
Perform hydrogeologic study and field-scale pilot demonstration to better define the feasibility of utilizing LDCC to minimize AMD formation.	LDCC plugging was determined to not be feasible.	No.

ROD2

All components implemented.

ROD3

All components implemented.

ROD4

All components implemented.

ATTACHMENT B

Parcels Included within the Site

Tax Assessor Number	Approximate Acreage [a]	Comment
011-160-04	202.9	
011-160-06	1.7	
011-160-07	1.9	
011-160-10	20.6	
011-160-27	80	North portion of parcel
011-160-36	23.1	
011-160-40	19.2	
011-160-41	15.2	
011-160-42	246.35	
011-160-45	100	North third and southwest half of parcel
011-160-46	156.26	
011-160-47	52	North fifth of parcel
011-160-48	36.14	
046-140-05	63	South half of parcel
046-140-06	257	South half of parcel
046-150-06	25.2	
046-150-07	2.6	
046-150-08	6.4	
046-160-02	95.7	
046-160-05	9.3	
046-160-06	6.7	
046-160-07	2	
046-160-08	1	
046-160-09	1	
046-160-12	857.19	

Tax Assessor Number	Approximate Acreage [a]	Comment
046-170-07	0.1	
046-170-08	6.4	
046-170-10	0.7	
046-170-16	437.13	
046-170-18	226.2	
065-010-01	53.5	
065-010-02	15.3	
065-010–03	153.4	
065-010-04	11.9	
065-010-10	4.5	
065-010-12	30	West half of parcel
065-030-03	150	North half of parcel
065-040-01	40	West third of parcel
065-040-02	20	West sixth of parcel

[a] Acreage adjusted if portion of Assessor's Parcel is within Site

ATTACHMENT C

Map of Site

NOTE: PARCEL BOUNDARIES WERE COMPILED FROM LAND PLATS SUPPLIED BY THE SHASTA COUNTY ASSESSORS OFFICE IN MARCH 1992. THE PARCEL BOUNDARIES SHOWN WERE NOT SURVEYED DURING COMPILATION OF THIS MAP. LEGAL DESCRIPTIONS SHOULD BE CONSULTED TO DETERMINE ACTUAL PARCEL BOUNDARIES

LEGEND

- Site Boundary
- Parcel Boundary
- Section Boundary
- Approx Top of Ridge, Parcel Boundary
- Creek, Parcel Boundary
- Creek

1000' 0 1000' 2000'

ATTACHMENT C
MAP OF IRON MOUNTAIN MINE SITE
STATEMENT OF WORK
SITE OPERATIONS AND MAINTENANCE

ATTACHMENT D

Design Documents and Operations Manuals

The following design documents, and operations manuals were completed since the October 2, 2000, *Statement of Work, Site Operations and Maintenance, Iron Mountain Mine, Shasta County California* was issued.

Design Documents

CH2M HILL. 2004. *Slickrock Creek Retention Reservoir ROD 4 Remedial Action Report.* September.

North Pacific Research. 2004. *Richmond Adit and Drifts Rehabilitation As Built Report.* October.

Shaw Environmental and Infrastructure. 2002. *Richmond Adit Mine Waste Repository Cell – Final As-Built Report.* August 28.

TRC. 2005. *Boulder Creek Tailings Area Spillway Improvements Final Construction Report.* March.

CH2MHIll, 2004, Slickrock Creek Retention Reservoir As-Built Drawings, September.

Operations Manuals

CH2M HILL. 2004. *Draft Operations and Maintenance Manual, Slickrock Creek Retention Reservoir Project.* June 11.

Iron Mountain Operations. 2008. *Emergency Response Plan and Contingency Procedures, Iron Mountain Operations, Redding, Shasta County, California.* April.

Iron Mountain Operations. 2004. *2003 Landfill Management Report and Plan.* January 30.

Iron Mountain Operations (IMO). 2003a. Letter from Rudolph L. Carver to Rick Sugarek/EPA re *Spring Creek Diversion RCCP Pipe Inspection and Repair Project, Recommendation for Contract Award.* May 19.

Iron Mountain Operations (IMO). 2003b. *Request for Proposal, Iron Mountain Mine Operations, Spring Creek Diversion RCCP Inspection and Repair Project, Shasta County, California.* April 25.

IT Iron Mountain Operations LLC. 2001a. *Operation and Maintenance Plan, Iron Mountain, Operations, LLC, Redding, Shasta County, California.* April.

IT Iron Mountain Operations, LLC. 2001b. *Quality Assurance Project Plan, Iron Mountain Operations, LLC, Redding, Shasta County, California.* April.

IT Iron Mountain Operations LLC. 2001c. *Stormwater Pollution Prevention Plan.* June.

SHN Consulting Engineers. 2007. *Health and Safety Plan.* September.

SHN Consulting Engineers. 2007. *Injury and Illness Prevention Program.* September.

ATTACHMENT E

Minnesota Flats Treatment Plant Maintenance Instructions

INCLUDED BY REFERENCE

ATTACHMENT F

Iron Mountain Mine 2012 Landfill Management Report and Plan

INCLUDED BY REFERENCE