demonstrating that Atlantic Richfield's predecessors were so closely involved with operations at Walker Mine as to warrant a finding that the shareholder was itself an "operator" of the Mine. This inquiry will require the Regional Board to analyze decades of historical documents, including thousands of pages of business records and correspondence related to Atlantic Richfield's predecessors' relationships with the Walker Mining Company. Based on established case law, past State Water Board decisions, and the documents so far produced by the Prosecution Team, the Regional Board would go well beyond the existing precedents if it were to make a finding of liability consistent with the Prosecution Team's argument. The Regional Board cannot, therefore, hold Atlantic Richfield (including its predecessors) liable for the acts of the separate and independent Walker Mining Company.

- Regional Board Liability: The Regional Board must also consider its own liability for the Sites. The Draft CAOs indicate that the Regional Board entered settlements with multiple former owners of the Mine Site. In exchange for payments from the settling parties, the Regional Board apparently agreed to indemnify those parties. Atlantic Richfield was not a party to those agreements and has a right to challenge whether those settlements fairly allocated liabilities amongst the settling parties consistent with their degree of ownership and involvement in the activities that have given rise to liabilities at these interrelated Sites. Consideration of this issue requires discovery and analysis of the communications, negotiations, and agreements between the Regional Board and the settling parties, as well as the activities of those parties that gave rise to potential liability. Additionally, the Regional Board has undertaken remedial actions at the Mine Site and is therefore liable for (1) any actions not consistent with the standard of care applicable to its remedial activities and, (2) any discharges the Regional Board may have caused or exacerbated in the course of its remedial activities. Here, too, the Regional Board will have to consider highly technical evidence regarding the work it has performed at the Sites and what impact that work has had on environmental conditions at the Sites.

- The Consent Decree: The Regional Board must evaluate the consent decree between USFS and Atlantic Richfield, including the scope of the contribution protection provisions therein, to determine its applicability to both Sites. To simply accept USFS's argument that the consent decree does not apply to the Mine Site without naming USFS a party to the Mine Site CAO proceedings and without providing Atlantic Richfield the corresponding opportunity to present argument and evidence on that point would be a further denial of Atlantic Richfield's due process rights.

- Apportionment: If the Regional Board were to find Atlantic Richfield liable for some aspect of operation at the Mine Site or Tailings Site, the Regional Board would then have to consider the extent of that liability. Numerous entities and individuals have conducted mining and remedial operations at the Sites under various owners. Prior to the Walker Mining Company staking claims at the Sites, unknown individuals conducted mining operations there while USFS owned all of the property. Even after Walker Mining Company patented its claims, there was a period of several years, perhaps over a decade, when Walker Mining Company (including any predecessor entities or individuals) was mining but Atlantic Richfield's predecessors had not yet acquired any stock in Walker Mining Company. And even when Atlantic Richfield's predecessors did hold stock in Walker Mining Company, mining operations stopped and started. Mining operations during those times also occurred in various locations at the Mine Site. Thus, the question of what (if any) share of responsibility Atlantic Richfield could bear for current environmental conditions is exceedingly complex and will depend on detailed analysis of highly technical issues involving facts that took place 70 or more years ago. As explained above, apportionment of harm arising from the Regional Board's operations and settlements with other owners, and USFS liability for pre-Walker Mining Company mining activities must also be considered.

- State Statutory Issues: In addition to the issues identified above, the Draft CAOs raise several more issues arising from California state law, including:

  - Application of the California Water Code, section 13304(j), which bars retroactive liability for lawful activities.

  - Application of statutes of limitation and repose for the Draft CAOs which seek to impose remedial obligations on the named Dischargers to each order.

  - Application of California Water Code Section 13304(c), which bars recovery of past costs through CAOs.

  - Application of California Code of Civil Procedure Section 877, which bars imposition of liability upon Atlantic Richfield for matters covered by the release of claims from the USFS.

Presenting the foregoing issues in either state or federal court would require two or more weeks of trial. Such a trial would be preceded by multiple rounds of extensively briefed and argued motions, as well as months of discovery including depositions of fact and expert witnesses. Atlantic Richfield recognizes that the Regional Board cannot replicate court procedures in its administrative framework, but the deficiencies in the Proposed Procedures must

be cured to allow presentation of the arguments and evidence the Regional Board will need to reach a reasoned decision on the many issues raised by the Draft CAOs.

II. The Sites are Interrelated as a Result of Both Historical Operations and Geography.

Besides overlooking the number and complexity of issues, the Proposed Procedures also fail to appreciate the interrelationship of the Sites. The Walker Mining Company operated the Sites as one facility and the connection between the Sites continues to this day. The Mine Site is adjacent to the Tailings Site less than a mile upstream along Little Dolly Creek. The tailings at the Tailings Site are the byproduct of mine operations at the Mine Site; after economically valuable portions of copper had been removed from the Walker Mine ore, the mill tailings were directed downstream for collection at the Tailings Site. Little Dolly Creek still connects the Sites. Accordingly, any remedial activity the Regional Board decides to require at the upstream Mine Site – which would almost certainly alter the quantity or character of Little Dolly Creek's flow, as well as possibly altering groundwater levels and movement in the area's aquifer – could potentially impact ongoing remedial activities at the downstream Tailings Site.

Considering both Sites at the same time is thus an integral part of Atlantic Richfield's counter-proposal. The interrelationship between the Sites means that most of the legal and factual defenses described above apply as much to the Mine Site as to the Tailings Site. Most importantly, the CERCLA Section 113(h) issue must be evaluated as to both Sites given the likely impact upstream remedial actions would have on the USFS's remedial work at the Tailings Site. Of course, the possibility that the Prosecution Team can prove some exception to the usual rules of shareholder non-liability is also dependent on historical facts relating to the integrated development and operation of the two Sites.

The Prosecution Team's continued suggestion to hold separate hearings on the two Sites, and USFS's apparent acquiescence in that suggestion, would only add to the inefficiencies inherent in the Proposed Procedures. USFS suggests that it would simplify matters for the Regional Board to consider the Tailings Site separately, if at all. That is not the case. As explained above, the Sites' histories cannot be considered separately and cannot be evaluated without USFS's full participation. The only issue related exclusively to USFS – sovereign immunity – relates to both sites insofar as Atlantic Richfield asserts that USFS must be a party to both Draft CAOs. If Atlantic Richfield's alternative procedures are adopted, the sovereign immunity issue may be evaluated along with all the other threshold issues implicating the Regional Board's jurisdiction and the parties' alleged liability. Given the litany of other issues the Regional Board must confront, no efficiency will result from separating the hearings based solely on the USFS's assertion of sovereign immunity.

III. Atlantic Richfield's Alternative Procedures Provide a More Efficient Framework for Resolving all the Issues the Regional Board Must Consider.

To efficiently address the many issues raised by the Draft CAOs, Atlantic Richfield proposes a hearing structure that bifurcates the more complex legal issues into a preliminary phase and leaves the more intensively factual / technical apportionment and remediation questions for a second phase. Atlantic Richfield's proposed calendar and protocols for pre-hearing discovery and disclosures is enclosed as an Addendum to this letter. A summary description of the bifurcated hearing structure follows.

A. Jurisdiction and Liability Phase

The first phase of the bifurcated hearing would consider all matters related to the Board's jurisdiction over the two Sites and the Parties identified as a "Discharger" for each site. This first phase would also consider all matters related to the liability of any Designated Party or third party for payment of costs, performance of actions, and any other relief at either or both Sites under the Draft CAOs.

The issues raised by the Prosecution Team's assertion of jurisdiction and designation of Atlantic Richfield and USFS as liable parties in these circumstances are the more complex legal questions the Regional Board must consider. Further, depending on how the Regional Board resolves these threshold legal questions, additional development of more complicated factual and technical issues may not be necessary. Atlantic Richfield therefore proposes dedicating a first phase hearing to the following issues:

1. Does CERCLA Section 113(h)'s bar on pre-enforcement review, the federal Consent Decree for the Walker Mine Tailings Site, sovereign immunity principles, and / or bankruptcy discharge provide a defense, in whole or in part, to the Regional Board's claims and grounds for jurisdiction at each Site?

2. Is the Regional Board a liable party as an "operator" for either Site or arising from settlements with other owners / operators for either Site?

3. Does The Anaconda Company's direct involvement with Walker Mining Company and the Walker Mine merit an exception to the usual rule that a corporate shareholder will not be held liable for the corporation's acts?

4. Is USFS a liable party as an "owner" or "operator" of the Tailings Site and does USFS bear any liability for the Mine Site?

5. Are there any third parties with liability for either Site?

6. Have all necessary parties been joined in the action?

7. Are any of the other issues raised above, or any further liability or jurisdictional issues that may later emerge, an impediment to the Regional Board's assertion of its authority in these circumstances?

The timeline and calendar appended to this letter outlines discovery and other pre-hearing tasks, and supports scheduling a "first phase" hearing in May 2014. The hearing would allocate time separately for both legal argument and factual testimony over the course of two days. The first three hours of hearing time would be devoted to oral argument and questions from the Regional Board concerning legal issues. The remainder of the first day of hearing and at least six hours on a second day of hearing would be used for presenting factual and expert testimony.

B. Apportionment and Remedy Phase

The second phase of the bifurcated hearing would consider the complex issues of apportionment and remedy. Phase 2 would proceed only in the event the Regional Board made liability determinations in the Phase 1 hearing that require further proceedings to resolve issues related to implementation of the Draft CAOs. In particular, if the Regional Board determined that Atlantic Richfield's predecessors had operated either of the Sites to some extent, further proceedings would be needed to determine what portion of the Walker Mine's operations Atlantic Richfield's predecessor had conducted, what (if any) ongoing environmental impacts those operations by Atlantic Richfield's predecessors caused, and what several (allocated) share of remedial costs or remedial actions Atlantic Richfield should bear as a result. Consistent with whatever findings the Regional Board made in Phase 1, the Regional Board would also need to consider allocation of costs and / or remedial action to USFS and the Regional Board itself.

As outlined in the appended timeline, deadlines for Phase 2 would begin to run only after the Regional Board issued a written decision addressing all of the issues raised in Phase 1. The Phase 2 determination would include such issues as:

1. Causation issues for each Site (i.e., specifically what operations each Designated Party conducted and what ongoing environmental conditions those operations caused).

2. Apportionment of costs and / or remedial responsibilities among liable Designated Parties for each Site.

3. The nature and relationship of the remedy for each Site.

4. Regional Board authority to bind a Designated Party to perform any future response action the Regional Board may identify after the Phase 1

and Phase 2 proceedings have been concluded and while any remedial activities are being carried out.

Assuming a written decision is available soon after the Phase 1 hearing, Phase 2 discovery could be completed in advance of a September or October hearing date. We refer to the appended timeline for a description of Phase 2 pre-hearing procedures and disclosures.

C. Applicable Rules.

The Proposed Procedures do not identify the Prosecution Team's burden of proof for the hearing. The Proposed Procedures also do not identify any basis on which the Prosecution Team may hold Atlantic Richfield jointly and severally liable under the Draft CAOs, though the Draft CAOs themselves suggest that is the Prosecution Team's intent. Accordingly, Atlantic Richfield urges the Regional Board to adopt the following procedural rules to govern any hearing it sets on the Draft CAOs:

- At any hearing on the Walker Mine Site and / or the Walker Tailings Site, the Prosecution Team will have the burden of production, together with the burden of persuasion by a preponderance of the evidence, as to any finding of fact and as to any finding that one or more parties is responsible for cleaning up and abating the site in question, including the proportionate share of liability which should be allocated to each such party. Each respondent will have the burden of production, together with the burden of persuasion by a preponderance of the evidence, as to any affirmative defense offered at the hearing.

- In any portion of a hearing assigning responsibility to Atlantic Richfield for either remedial activities or the costs of remedial activities, the Prosecution Team shall have the burden to prove that any remedial activities or costs for which it seeks to hold Atlantic Richfield responsible are necessary because Anaconda or International Smelting & Refining Company has caused the specific condition requiring remediation by a discharge of wastes into the waters of the state.

- In any portion of a hearing assigning responsibility to Atlantic Richfield for either remedial activities or the costs of remedial activities, the Prosecution Team shall be precluded from presenting any evidence of remedial activities or costs attributable to a discharge of wastes into the waters of the state by any individual or entity other than Anaconda or International Smelting & Refining Company.

Proceeding to a hearing without additional clarification of the rules proposed above would be a further violation of Atlantic Richfield's due process rights.

On behalf of Atlantic Richfield, we look forward to the Regional Board's decision as to the appropriate procedures for resolving the claims made in the Draft CAOs.

Sincerely,

William J. Duffy
for
DAVIS GRAHAM & STUBBS LLP

Enclosures
cc: Andrew Tauriainen, Esq.
Michael Hope, Esq.

IMPORTANT DEADLINES
Phase 1 Hearing

December 6, 2013	▪ Atlantic Richfield (AR) / USDA will transmit any requests under CPRA to the Regional Board by this date. ▪ The Board will respond to each request within 10 days of receipt and produce documents and other responsive information within 30 days of receipt.
January 17, 2013	▪ Each Designated Party may propound up to 20 interrogatoriees by this date. Responses to interrogatories are due within 20 days of receipt.
January 31, 2013	▪ Each Designated Party may propound up to 20 requests for admission by this date. ▪ Responses to requests for admission are due within 20 days of receipt.
February 7, 2014	▪ Designated Parties must ask the Board to add additional parties by this date.
February 24, 2014	▪ Each Designated Party shall disclose a list of witnesses that may be called to testify at the hearing, including a brief description of the topics each witness will cover. This disclosure shall include a general description of the type of experts, if any, the party intends to use. The identity of any expert need not be disclosed until the expert disclosure.
March 7, 2014	▪ The Designated Parties will exchange expert disclosures that shall contain the qualifications of the expert, a summary of all opinions the expert may offer at the hearing, and a description of the basis for those opinions.
March 19, 2014	▪ A Designated Party may make supplemental expert disclosures with opinions or comments in rebuttal to another party's expert, provided that supplementation is completed this day.
March 21, 2014	▪ Each Designated Party may take up to four depositions of percipient witnesses, and depose all expert witnesses designated by the opposing side. ▪ Each deposition shall be no longer than six hours. All non-expert depositions shall be completed by this date.
April 14, 2014	▪ All expert depositions shall be completed by this date.
20 days prior to the date of the hearing	▪ The Designated Parties may submit pre-hearing briefs, with a copy provided contemporaneously to each remaining Designated Party, that outline the legal and factual matters for determination by the Board at the Hearing. Any Designated Party may request oral argument on a legal matter raised for determination by the Board. ▪ Each Designated Party may append to its pre-hearing brief proposed findings of fact and law for the Board's consideration.

10 days prior to the hearing	▪ Each Designated Party shall disclose a list of exhibits it expects to use at the hearing, and disclose any and all demonstrative exhibits including all PowerPoint presentations that may be used at the hearing.
May 2014	▪ The hearing shall take place on a mutually agreeable date in May 2014 and shall be no more than two days in length, depending upon the number of Designated Parties and Interested Persons involved and issues presented for determination by the Board. ▪ The first three hours of hearing time will be dedicated to oral argument and questions from the Regional Board regarding legal issues identified in the parties' pre-hearing briefs. ▪ The remainder of the first day's hearing time, and at least six hours during a second day of hearing, will be used for presentation of testimony and other evidence on factual issues.

IMPORTANT DEADLINES
Phase 2 Hearing

	▪ Each Designated Party and/or its experts shall be permitted access to the Walker Mine Site and the Walker Mine Tailings Site, provided at least 4 days advanced notice is provided
15 days following receipt of Board's written decision in the liability hearing	▪ AR/USDA will transmit any additional CPRA records requests by this date. The Board will respond to each such request within 10 days of receipt, and produce documents and other responsive information within 30 days of receipt.
30 days following the Board's written decision	▪ Designated Parties must ask the Board to add additional parties by this date.
30 days following receipt of the Board's written decision	▪ Each Designated Party shall disclose a list of witnesses that may be called to testify at the hearing, including a brief description of the topics each witness will cover. This disclosure shall include a general description of the expert testimony, if any, the party intends to offer at the hearing. The identity of any expert need not be disclosed until the expert disclosure, as described below.
45 days following receipt of the Board's written decision	▪ Each Designated Party may propound up to 20 requests for admission by this date. Responses to requests for admission are due within 20 days of receipt.
45 days following receipt of the Board's written decision	▪ Each Designated Party may propound up to 20 interrogatories by this date. Responses to interrogatories are due within 20 days of receipt.
60 days following receipt of the Board's written decision	▪ The Designated Parties will exchange expert disclosures that shall contain the qualifications of the expert, a summary of all opinions the expert may offer at the hearing, and a description of the basis for those opinions.
14 days following receipt of expert disclosures	▪ A Designated Party may make supplemental expert disclosures with opinions or comments in rebuttal to another party's expert, provided that supplementation is completed by this date.
60 days following receipt of the Board's written decision	▪ Each Designated Party may take up to four depositions of percipient witnesses and depose all expert witnesses designated by the opposing side. Each deposition shall be no longer than six hours. All non-expert depositions shall be completed by this date.
90 days following receipt of the Board's written decision	▪ All expert depositions shall be completed by this date.
20 days prior to the date of the hearing	▪ Each Designated Party may submit pre-hearing briefs, with a copy provided contemporaneously to each party, that outline the legal and factual matters for determination by the Board at the Hearing. Any Designated Party may request oral argument on a legal matter raised for determination by the Board.

	▪ Each Designated Party may append to its pre-hearing brief proposed findings of fact and law for the Board's consideration.
10 days prior to the hearing	▪ Each Designated Party shall disclose a list of exhibits it expects to use at the hearing, and disclose any and all demonstrative exhibits including all PowerPoint presentations that may be used at the hearing.
No sooner than one hundred twenty (120) days following publication of the Board's written decision	▪ The hearing shall take place on a mutually agreeable date no sooner than one hundred twenty (120) days following publication of the Board's written decision on the matters addressed in the Phase 1 hearing. ▪ The hearing shall be no more than two days in length, depending upon the number of Designated Parties and Interested Persons involved and issues presented for consideration by the Board.

Exhibit 31

Central Valley Regional Water Quality Control Board

HEARING PROCEDURE (AMENDED 1/29/2014)
FOR CLEANUP AND ABATEMENT ORDERS

R5-2014-XXXX
ISSUED TO
ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE
WALKER MINE TAILINGS
PLUMAS COUNTY

AND

R5-2014-YYYY
ISSUED TO
ATLANTIC RICHFIELD COMPANY
WALKER MINE
PLUMAS COUNTY

SCHEDULED FOR 27/28 MARCH 2014

PLEASE READ THIS HEARING PROCEDURE CAREFULLY. FAILURE TO COMPLY WITH THE DEADLINES AND OTHER REQUIREMENTS CONTAINED HEREIN MAY RESULT IN THE EXCLUSION OF YOUR DOCUMENTS AND/OR TESTIMONY.

Overview

On 27/28 March, 2014, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) will conduct a hearing to consider Cleanup and Abatement Order (CAO) R5-2014-XXXX, regarding Walker Mine Tailings, and CAO R5-2014-YYYY, regarding the Walker Mine, both in Plumas County. Given the overlap between the parties, issues, alleged facts and evidence, the Central Valley Water Board will consider both CAOs during the same hearing. The proposed CAOs impose cleanup obligations, including characterizing waste material and conducting remediation activities, on those who have legal responsibility for mining wastes at the Walker Mine and Tailings.

The purpose of the hearing is to consider relevant evidence and testimony regarding the CAOs. At the hearing, the Central Valley Water Board will consider whether to issue the CAOs as proposed, whether to modify or remand the CAOs, or whether to direct other appropriate actions designed to control discharges from the Walker Mine and Tailings site. If less than a quorum of the Board is available, this matter may be conducted before a hearing panel. The public hearing will commence at 8:30 a.m. or as soon thereafter as practical, or as announced in the Board's meeting agenda. The meeting will be held at:

11020 Sun Center Drive, Suite 200, Rancho Cordova, California.

An agenda for the meeting will be issued at least ten days before the meeting and posted on the Board's web page at:

http://www.waterboards.ca.gov/centralvalley/board_info/meetings

Hearing Procedure

The hearing will be conducted in accordance with this Hearing Procedure. The Hearing Procedure was initially prepared by the Prosecution Team, and was subsequently revised by the Advisory Team with

only minor changes. The procedures governing adjudicatory hearings before the Central Valley Water Board may be found at California Code of Regulations, title 23, section 648 et seq., and are available at

http://www.waterboards.ca.gov

Copies will be provided upon request. In accordance with Section 648(d), any procedure not provided by this Hearing Procedure is deemed waived. Except as provided in Section 648(b) and herein, Chapter 5 of the Administrative Procedures Act (Gov. Code, § 11500 et seq.) does not apply to this hearing.

The procedures and deadlines herein may be amended by the Advisory Team in its discretion. Objections to the hearing procedures had to be received by the Central Valley Water Board's Advisory Team no later than **5 p.m. on 6 December 2013**, or they were waived. Failure to comply with the deadlines and requirements contained herein may result in the exclusion of documents and/or testimony. The January 27, 2014 version of the Hearing Procedure incorporates the Chair rulings on objections submitted regarding the original Hearing Procedure.

Separation of Prosecutorial and Advisory Functions

To help ensure the fairness and impartiality of this proceeding, the functions of those who will act in a prosecutorial role by presenting evidence for consideration by the Board (the "Prosecution Team") have been separated from those who will provide legal and technical advice to the Board (the "Advisory Team"). Members of the Advisory Team are: Ken Landau, Assistant Executive Officer; David Coupe, Senior Staff Counsel, and Alex MacDonald, Senior Engineer. Members of the Prosecution Team are: Pamela Creedon, Executive Officer; Andrew Altevogt, Assistant Executive Officer; Rob Busby, Supervising Engineering Geologist; Jeffrey Huggins, Water Resources Control Engineer; and Andrew Tauriainen, Senior Staff Counsel.

Any members of the Advisory Team who normally supervise any members of the Prosecution Team are not acting as their supervisors in this proceeding, and vice versa. Pamela Creedon regularly advises the Central Valley Water Board in other, unrelated matters, but is not advising the Central Valley Water Board in this proceeding. Other members of the Prosecution Team act or have acted as advisors to the Central Valley Water Board in other, unrelated matters, but they are not advising the Central Valley Water Board in this proceeding. Members of the Prosecution Team have not had any ex parte communications with the members of the Central Valley Water Board or the Advisory Team regarding this proceeding.

Hearing Participants

Participants in this proceeding are designated as either "Designated Parties" or "Interested Persons." Designated Parties may present evidence and cross-examine witnesses and are subject to cross-examination. Interested Persons may present non-evidentiary policy statements, but may not cross-examine witnesses and are not subject to cross-examination. Interested Persons generally may not present evidence (e.g., photographs, eye-witness testimony, monitoring data). At the hearing, both Designated Parties and Interested Persons may be asked to respond to clarifying questions from the Central Valley Water Board, staff, or others, at the discretion of the Board Chair.

The following participants are hereby designated as Designated Parties in this proceeding:

1. Central Valley Water Board Prosecution Team
2. Atlantic Richfield Company (R5-2014-XXXX and R5-2014-YYYY)
3. United States Forest Service (R5-2014-XXXX only)

Requesting Designated Party Status

Persons who wish to participate in the hearing as a Designated Party must request designated party status by submitting a request in writing so that it is received no later than the deadline listed under "Important Deadlines" below. The request shall include an explanation of the basis for status as a Designated Party (i.e., how the issues to be addressed at the hearing affect the person, the need to present evidence or cross-examine witnesses), along with a statement explaining why the parties listed above do not adequately represent the person's interest. Any objections to these requests for designated party status must be submitted so that they are received no later than the deadline listed under "Important Deadlines" below.

Primary Contacts

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Ex Parte Communications

Designated Parties and Interested Persons are forbidden from engaging in ex parte communications regarding this matter. An ex parte communication is a written or verbal communication related to the investigation, preparation, or prosecution of the CAOs between a Designated Party or an Interested Person and a Board Member or a member of the Board's Advisory Team (*see* Gov. Code, § 11430.10 et seq.). However, if the communication is copied to all other persons (if written) or is made in a manner open to all other persons (if verbal), then the communication is not considered an ex parte communication. Communications regarding non-controversial procedural matters are also not considered ex parte communications and are not restricted.

Hearing Time Limits

To ensure that all participants have an opportunity to participate in the hearing, the following time limits shall apply: the Central Valley Water Board's Prosecution Team shall have a total of **90 minutes** to present evidence (including evidence presented by witnesses called by the Prosecution Team), cross-examine witnesses (if warranted), and provide a closing statement; the remaining Designated Parties shall each have **45 minutes** to present evidence (including evidence presented by witnesses called by the Designated Party), cross-examine witnesses (if warranted), and provide a closing statement. Each Interested Person shall have 3 minutes to present a non-evidentiary policy statement. Participants with similar interests or comments are requested to make joint presentations, and participants are requested to avoid redundant comments. Participants who would like additional time must submit their request to the Advisory Team so that it is received no later than the deadline listed under "Important Deadlines" below. Additional time may be provided at the discretion of the Advisory Team (prior to the hearing) or the Board Chair (at the hearing) upon a showing that additional time is necessary. Such showing shall explain what testimony, comments, or legal argument requires extra time, and why it could not have been provided in writing by the applicable deadline.

A timer will be used, but will not run during Board questions or the responses to such questions, or during discussions of procedural issues.

Submission of Evidence and Policy Statements

The Prosecution Team and all other Designated Parties must submit the following information in advance of the hearing:

1. All evidence (other than witness testimony to be presented orally at the hearing) that the Designated Party would like the Central Valley Water Board to consider. Evidence and exhibits already in the public files of the Central Valley Board may be submitted by reference, as long as the exhibits and their location are clearly identified in accordance with California Code of Regulations, title 23, section 648.3. Board members will not generally receive copies of materials incorporated by reference unless copies are provided, and the referenced materials are generally not posted on the Board's website.
2. All legal and technical arguments or analysis.
3. The name of each witness, if any, whom the Designated Party intends to call at the hearing, the subject of each witness' proposed testimony, and the estimated time required by each witness to present direct testimony.
4. The qualifications of each expert witness, if any.

Prosecution Team: The Prosecution Team's information must include the legal and factual basis for its claims against each Discharger; a list of all evidence on which the Prosecution Team relies, which must include, at a minimum, all documents cited in the Cleanup and Abatement Orders, Staff Report, or

other material submitted by the Prosecution Team; and the witness information required under items 3-4 for all witnesses, including Board staff.

Remaining Designated Parties (including the Dischargers): All remaining Designated Parties shall submit comments regarding the Cleanup and Abatement Orders along with any additional supporting evidence not cited by the Central Valley Water Board's Prosecution Team no later than the deadline listed under "Important Deadlines" below.

Rebuttal: Any Designated Party that would like to submit evidence, legal analysis, or policy statements to rebut information previously submitted by other Designated Parties shall submit this rebuttal information so that it is received no later than the deadline listed under "Important Deadlines" below. "Rebuttal" means evidence, analysis or comments offered to disprove or contradict other submissions. Rebuttal shall be limited to the scope of the materials previously submitted. Rebuttal information that is not responsive to information previously submitted may be excluded.

Copies: Board members will receive copies of all submitted materials. The Board Members' hard copies will be printed in black and white on 8.5"x11" paper from the Designated Parties' electronic copies. Designated Parties who are concerned about print quality or the size of all or part of their written materials should provide an extra nine paper copies for the Board Members. For voluminous submissions, Board Members may receive copies in electronic format only. Electronic copies will also be posted on the Board's website. Parties without access to computer equipment are strongly encouraged to have their materials scanned at a copy or mailing center. The Board will not reject materials solely for failure to provide electronic copies.

Other Matters: The Prosecution Team will prepare a summary agenda sheet (Summary Sheet) and will respond to all significant comments. The Summary Sheet and the responses shall clearly state that they were prepared by the Prosecution Team. The Summary Sheet and the responses will be posted online, as will revisions to the proposed Order.

Interested Persons: Interested Persons who would like to submit written non-evidentiary policy statements are encouraged to submit them to the Advisory Team as early as possible, but they must be received by the deadline listed under "Important Deadlines" to be included in the Board's agenda package. Interested Persons do not need to submit written comments in order to speak at the hearing.

Prohibition on Surprise Evidence: In accordance with California Code of Regulations, title 23, section 648.4, the Central Valley Water Board endeavors to avoid surprise testimony or evidence. Absent a showing of good cause and lack of prejudice to the parties, the Board Chair may exclude evidence and testimony that is not submitted in accordance with this Hearing Procedure. Excluded evidence and testimony will *not* be considered by the Central Valley Water Board and will not be included in the administrative record for this proceeding.

Presentations: Power Point and other visual presentations may be used at the hearing, but their content shall not exceed the scope of other submitted written material. These presentations must be provided to the Advisory Team at or before the hearing both in hard copy and in electronic format so that they may be included in the administrative record.

Witnesses: All witnesses who have submitted written testimony shall appear at the hearing to affirm that the testimony is true and correct, and shall be available for cross-examination.

Evidentiary Documents and File

The Cleanup and Abatement Orders and related evidentiary documents are on file and may be inspected or copied at the Central Valley Water Board office at 11020 Sun Center Drive, Rancho Cordova, CA 95670. This file shall be considered part of the official administrative record for this hearing. Other submittals received for this proceeding will be added to this file and will become a part

of the administrative record absent a contrary ruling by the Central Valley Water Board's Chair. Many of these documents are also posted on-line at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/index.shtml

Although the web page is updated regularly, to assure access to the latest information, you may contact Jeffrey Huggins (contact information above) for assistance obtaining copies.

Questions

Questions concerning this proceeding may be addressed to the Advisory Team attorney (contact information above).

IMPORTANT DEADLINES

All required submissions must be received by 5:00 p.m. on the respective due date.

22 November 2013	▪ Prosecution Team sends proposed Hearing Procedure to Dischargers and Advisory Team.
6 December 2013	▪ Objections due on Hearing Procedure. ▪ Deadline to request "Designated Party" status. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons, Prosecution Team Attorney, Advisory Team Attorney Electronic *and* Hard Copies to: Prosecution Team Primary Contact, Advisory Team Primary Contact
20 December 2013	▪ Reply to Objections on Hearing Procedure. ▪ Deadline to submit opposition to requests for Designated Party status. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons, Prosecution Team Attorney, Advisory Team Attorney Electronic *and* Hard Copies to: Prosecution Team Primary Contact, Advisory Team Primary Contact
10 January 2014	▪ Advisory Team issues decision on requests for Designated Party status. ▪ Advisory Team issues decision on Hearing Procedure objections.
23 January 2014	▪ Prosecution Team's deadline for submission of information required under "Submission of Evidence and Policy Statements," above. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons Electronic *and* Hard Copies to: Advisory Team Primary Contact, Advisory Team Attorney
20 February 2014	▪ Remaining Designated Parties' (including the Discharger's) deadline to submit all information required under "Submission of Evidence and Policy Statements" above. This includes all written comments regarding the CAOs. ▪ Interested Persons' comments are due. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons, Prosecution Team Attorney, Advisory Team Attorney Electronic *and* Hard Copies to: Prosecution Team Primary Contact, Advisory Team Primary Contact
6 March 2014[†]	▪ All Designated Parties shall submit any rebuttal evidence, any rebuttal to legal arguments and/or policy statements, and all evidentiary objections. ▪ Deadline to submit requests for additional time. ▪ If rebuttal evidence is submitted, all requests for additional time (to respond to the rebuttal at the hearing) must be made within 3 working days of *this* deadline. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons, Prosecution Team Attorney, Advisory Team Attorney Electronic *and* Hard Copies to: Prosecution Team Primary Contact, Advisory Team Primary Contact
6 March 2014[†]	▪ Prosecution Team submits Summary Sheet and responses to comments. Electronic *or* Hard Copies to: All other Designated Parties, All known Interested Persons Electronic *and* Hard Copies to: Advisory Team Primary Contact, Advisory Team Attorney
27/28 March 2014	Hearing

[†] *This deadline is set based on the date that the Board compiles the Board Members' agenda packages. Any material received after this deadline will not be included in the Board Members' agenda packages.*

Exhibit 32

002711

WALKER MINE REPORT

October 5, 1957

L. E. Trumbull

SUMMARY

Walker Mine, Plumas County, has been inoperative since 1942, but continues to impair waters of Little Grizzly Creek and Indian Creek through discharges of toxic materials and silt. Restoration of Little Grizzly Creek, as a recreational area, and protection of irrigation and recreational water uses in Indian Valley may be approached by a) establishment of jurisdictions; b) setting of requirements; and c) cooperative action among the several interested parties.

002712

WALKER MINE, PLUMAS COUNTY
WATER POLLUTION STUDY

Insert 3.

OCTOBER 5, 1957
L. E. TRUMBULL

1. DESCRIPTION OF AREA:

WALKER MINE LIES IN PLUMAS COUNTY ABOVE TAYLORSVILLE. IT IS SITUATED NEAR THE TOP OF A MOUNTAIN AT AN ELEVATION OF 6200 FEET. MINE PORTAL AND STRUCTURES LIE IN A SLOPING BOWL WHICH IS THE SOURCE OF "WALKER" CREEK. NUMEROUS SPRINGS ORIGINATE AROUND THE PERIPHERY OF THIS BOWL, WITH ALL WATERS BEING OF EXCELLENT QUALITY.

THIS REGION IS GENERALLY FORESTED WITH PINE AND FIR, WITH ROCK OUTCROPS SHOWING ON MOUNTAIN TOPS. MUCH OF THE TIMBER IS SECOND GROWTH, AS THE MINE OPERATIONS CONSUMED MUCH OF THE AVAILABLE TIMBER. ALSO A SAW MILL WAS OPERATING ON MINE PROPERTY UP TO 1952, SAWING TIMBER TAKEN FROM MINE PROPERTIES.

COUNTY RECORDS SHOW THAT 764 ACRES OF PATENTED LAND ARE LISTED IN THE WALKER MINE HOLDINGS, WITH SEVERAL TIMES THIS ACREAGE HELD IN ADJOINING MINING CLAIMS. THE REGION IS FAIRLY ISOLATED AND FINDS ITS MAJOR USE AS A RECREATIONAL AREA, PARTICULARLY FOR DEER HUNTING. LITTLE GRIZZLY CREEK, DRAINING THE AREA, IS GENERALLY REGARDED AS BARREN, AND FEW FISHERMEN NOW PLY THE STREAM.

2. WATERS OF THE AREA: Streams affected by Mine Drainage.

WALKER MINE AREA IS THE SOURCE OF NUMEROUS SPRINGS WHICH FORM A TRIBUTARY TO LITTLE GRIZZLE CREEK. FOR WANT OF A BETTER NAME, THIS TRIBUTARY IS HEREIN CALLED "WALKER CREEK". WALKER CREEK TRAVERSES THE TAILINGS DEPOSIT AND JOINS LITTLE GRIZZLY CREEK JUST ABOVE BROWNS CABIN, ABOUT 1.5 MILES BELOW THE MINE PORTAL. LITTLE GRIZZLY CREEK TUMBLES THROUGH SOME 10 MILES OF NARROW CANYON TO JOIN INDIAN CREEK ABOUT 5 MILES ABOVE TAYLORSVILLE. WATER IS DIVERTED FROM INDIAN CREEK, JUST ABOVE TAYLORSVILLE INTO THE IRRIGATION CANALS OF THE AMERICAN AND INDIAN VALLEY SOIL CONSERVATION DISTRICT.

MR. HUMPHREY OF GREENVILLE, IS A MEMBER OF THE BOARD OF DIRECTORS OF THIS DISTRICT AND PROVIDED INFORMATION ON THE DISTRICTS OPERATION. HE INDICATED THAT, AT THE PRESENT TIME, SILTATION IN DISTRICT CANALS IS NOT SEVERE. HE ALSO NOTED THAT, DURING THE HIGH WATER PERIOD, INDIAN CREEK IS QUITE TURBID ABOVE LITTLE GRIZZLY CREEK, AND THE DISTRICT DOES NOT FEEL THAT WALKER MINE TAILINGS ARE PRESENTLY A MAJOR FACTOR IN CANAL SILTATION. HE DID NOT FEEL THE DISTRICT WOULD CONTRIBUTE TOWARDS A COOPERATIVE SOLUTION OF WALKER MINE AREA PROBLEMS.

FISH AND GAME AND SPORTSMANS ORGANIZATIONS ARE INTERESTED IN RESTORING FISH POPULATION TO LITTLE GRIZZLY CREEK, SAID TO HAVE BEEN EXCELLENT TROUT WATERS AT ONE TIME. THE STREAM CURRENTLY SUPPORTS TROUT ABOVE THE WALKER MINE BUT IS BARREN MOST OF THE YEAR IN THE LOWER REACHES. TROUT DO MOVE UP INTO THIS CREEK DURING THE LATE FALL MONTHS WHEN TOXIC MINE WASTES ARE AT MINIMUM FLOW.

A NUMBER OF FISH KILLS HAVE BEEN REPORTED IN INDIAN CREEK BELOW THE CONFLUENCE OF LITTLE GRIZZLY CREEK. MEAGER DATA AVAILABLE INDICATE

FISH DEATHS WERE PROBABLY DUE TO SUSPENDED MATERIALS, POSSIBLE ABRASIVE SOLIDS FROM THE WALKER MINE TAILINGS DUMP. CATFISH AND CARP APPARENTLY SUFFER GREATEST MORTALITY, WITH TROUT POPULATION IN INDIAN CREEK NOT SHOWING ANY PARTICULAR DISTRESS.

IN JULY, 1947, DEPARTMENT OF FISH AND GAME PLANTED 5000 TROUT IN LITTLE GRIZZLY CREEK, SOME 5 MILES DOWNSTREAM FROM WALKER MINE. ALL FISH DIED WITHIN 24 HOURS. AGAIN IN 1949, TROUT IN A CAGE WERE PLACED IN LITTLE GRIZZLY CREEK AT BROWNS CABIN; THESE TROUT WERE ALL DEAD WITHIN THE SPACE OF 1 HOUR.

INSPECTION OF LITTLE GRIZZLY CREEK INDICATES THE COMBINATION OF SAND DEPOSITS AND TOXIC MINE DRAINAGE HAS CAUSED A STERILE STREAM CONDITION. PLANT AND AQUATIC LIFE APPEAR TO BE ALMOST TOTALLY ABSENT, ALTHOUGH SHRUBBERY AND TREES LINING THE STREAMS APPEAR HEALTHY.

WALKER MINE WORKINGS SURFACE ON THE OTHER SIDE OF THE RIDGE FROM LITTLE GRIZZLY CREEK, WHERE DRAINAGE IS INTO WARD CREEK. WARD CREEK EMPTIES INTO INDIAN CREEK ABOUT 2 MILES ABOVE THE CONFLUENCE OF LITTLE GRIZZLY CREEK. IT IS REPORTED THAT MINE WATERS WERE PUMPED INTO WARD CREEK DURING MINE OPERATIONS, AND THAT WARD CREEK WAS BARREN OF FISH LIFE DURING THIS PERIOD. THERE IS NO INDICATION THAT MINE WASTES HAVE OVERFLOWED INTO THIS DRAINAGE IN RECENT TIMES.

3. MINE WATERS: Drainage

3A. MINE OWNERSHIP:

OWNERSHIP OF MINE PROPERTIES IS QUITE CONFUSED AT THE PRESENT TIME, ALTHOUGH IT CURRENTLY WOULD APPEAR THE ROBERT E. BARRY, 29 HEREFORD ROAD, BRONXVILLE, NEW YORK, REPRESENTS THE PROPERTY OWNERS.

TITLE TO THE PROPERTY APPEARED TO RESIDE CLEARLY WITH ANACONDA COPPER UP TO 1942, WHEN THE OPERATION OF THE MINE CEASED. IT IS REPORTED THAT ANACONDA SOLD TO AN INVESTMENT GROUP WHO AUCTIONED OFF THE PROPERTIES ABOUT 1946. ROBERT E. WILSON, APPARENTLY BID IN MOST OF THE ASSETS, USING THE FINANCIAL BACKING OF A MR. CAREY, SAID TO HAVE BEEN PRESIDENT OF THE YALE AND TOWNE COMPANY.

AT THIS POINT, THE TRANSACTIONS BECOME QUITE COMPLICATED AND CONFUSED. IT IS REPORTED WILSON FAILED TO MEET ALL PURCHASE COMMITTMENTS, BUT PROCEEDED TO ESTABLISH SUBSIDIARY ORGANIZATIONS, INCLUDING PLUMAS LAND CORPORATION, PLUMAS MINING CORPORATION, AND PLUMAS LUMBER CORPORATION.

IT IS REPORTED THAT THE MORE VALUABLE LANDS, BUILDINGS, EQUIPMENT AND HOUSING WERE TRANSFERRED TO THESE CORPORATIONS, WHOSE CONTROLLING OWNERSHIP WAS REPORTEDLY ESTABLISHED BY WILSON, WITH DUBIOUS AUTHORITY, AS WILSON AND MRS. WILSON.

ABOUT 1948, CAREY MOVED TO TAKE OVER OPERATION FROM WILSON, BUT DIED IN AN AUTO ACCIDENT SHORTLY THEREAFTER. ROBER R. BARRY, AND WILFORD CAREY, CAME ONTO THE SCENE AT THIS POINT AS ADMINISTRATORS FOR THE ESTATES OF W. GIBSON CAREY, JR., PLUMAS LAND CORPORATION, ETAL.

IN 1948, WILSON ENTERED SUIT IN SUPERIOR COURT TO DETERMINE RIGHTS AND INTERESTS IN WALKER MINE PROPERTIES. LATER IN 1948, WILSON BY AFFIDAVIT RELEASED HIS INTERESTS IN TIMBER RIGHTS ON THE PATENTED LANDS.

IN MAY, 1957, THE SUPERIOR COURT DISMISSED WILSON'S SUIT (OF 1948) FOR FAILURE TO PROSECUTE WITH REASONABLE DILIGENCE, AND RULED A JUDGEMENT OF DISMISSAL BE FILED AGAINST R. P. WILSON.

ON MAY 31, 1957, R. P. WILSON, APPEALED THIS DECISION TO THE DISTRICT COURT OF APPEALS, THUS OWNERSHIP AND INTERESTS OF SEVERAL PARTIES REMAINS IN LITIGATION.

BASED UPON THE MAY 1957, DECISION OF THE COURT, AND UPON PERUSAL OF WILSON'S CHARGES AGAINST BARRY, IT APPEARS THAT BARRY MUST BE LOGICALLY CONSIDERED THE LEGAL OWNER OF WALKER MINE PROPERTY. IT IS TO BE NOTED, HOWEVER, THAT SALE OF TIMBER AND A PROPOSED TUNNEL TO TAP WALKER MINE DEPOSITS (TO BE DRIVEN FROM GENESSEE) ARE CURRENTLY HELD UP BECAUSE TITLE GUARANTEE COMPANIES WILL HAVE NOTHING TO DO WITH WALKER MINE PROPERTIES.

COUNTY RECORDS INDICATE THAT BARRY HAS BEEN PAYING TAXES ON THE 764 ACRES OF PATENTED GROUND WHICH INCLUDES THE MILL SITE AND MAJOR DEPOSIT AREAS.

IN A LETTER DATED SEPTEMBER 15, 1957, MR. R. R. BARRY HAS ACKNOWLEDGED THAT HE REPRESENTS THE WALKER MINE OWNERS.

3B. MINE DESCRIPTION AND SOURCE OF WATERS:

WALKER MINE WAS ORIGINALLY LOCATED AS AN ORE OUTCROP ON TOP OF THE RIDGE. RATHER EXTENSIVE MINING WAS CARRIED ON AT THIS POINT, WITH ORE BEING TRAMMED TO THE MILL AT WALKER MINE. THIS MINING AREA IS LOCATED ABOVE THE SO-CALLED "CENTRAL ORE-BODY" AND MAY BE IDENTIFIED BY THE "GLORY-HOLE". IT WOULD APPEAR THAT SNOW MELT IN THIS AREA WILL CONTRIBUTE CONSIDERABLE WATER TO THE WALKER MINE UNDERGROUND SYSTEM.

AT A LATER DATE, A TUNNEL WAS DRIVEN FROM THE MILL SITE TO TAP THE ORE BODIES. THIS TUNNEL IS REPORTED TO HAVE ENCOUNTERED 200 FEET OF CLAY AND DECOMPOSED GRANITE, WHICH SECTION WAS TIMBERED, PRIOR TO ENTERING SOLID ROCK. THIS TUNNEL THEN TRAVELLED SOME 2000 FEET TO TIE INTO THE WORKING LATERAL, SOME 8000 FEET LONG, WHICH CROSSED THROUGH THE 5 MAJOR ORE BODIES, THE SOUTH, CENTRAL, NORTH, 712, AND PIUTE.

THREE OTHER LATERALS ARE REPORTED, ONE 300 AND ONE 700 FEET BELOW THE MAIN TUNNEL, AND ANOTHER 600 FEET ABOVE THE MAIN TUNNEL. IN ALL, SOME 15 TO 20 MILES OF TUNNEL ARE SAID TO EXIST. IN 1928, A RAISE WAS DRIVEN FROM THE PIUTE ORE BODY TO THE SURFACE, AND VENTILATION EQUIPMENT PROVIDED AT THIS POINT.

THE 5 ORE BODIES WERE EXTENSIVELY STOPED, WITH RATHER TREMENDOUS CAVITIES LEFT IN THE BOWELS OF THE EARTH. ESTIMATED CAVITY VOLUMES ARE:

SOUTH ORE BODY:	2.0	MILLION CU. FEET.
CENTRAL:	17.0	MILLION CU. FEET.
NORTH:	192	MILLION CU. FEET.
712:	20.	MILLION CU. FEET.
PIUTE:	300	MILLION CU. FEET
TOTAL	531	MILLION CUBIC FEET.

IN MORE UNDERSTANDABLE FIGURES, THIS REPRESENTS A ROOM 1 SQUARE MILE IN AREA AND ABOUT 20 FEET HIGH. MUCH OF THIS SPACE MAY BE FILLED WITH WASTE ROCK, BUT IT IS EVIDENT FROM THESE FIGURES THAT A TREMENDOUS EXPOSURE OF ORES TO OXIDATIVE CONDITIONS DOES EXIST.

FORMER MINE EMPLOYEES REPORT THAT UNDERGROUND AREA HAD MANY DRIPS AND SEEPS FROM OVERHEAD. GROUND SURFACE VARIED FROM 400 TO 900 FEET ABOVE THE MAIN TUNNEL, THUS WATER DRIPS WERE RATHER CLOSELY ASSOCIATED WITH SNOW MELT AND SURFACE RUN-OFF. APPARENTLY WORKINGS WERE FAIRLY DRY IN LATE FALL AND EARLY WINTER.

PUMPS WERE REQUIRED TO KEEP LOWER LEVELS EXPOSED, AND CONTINUOUS PUMPING OF LARGE VOLUMES OF WATER IS REPORTED. THIS PUMPING WAS OF SUCH EXTREME IMPORTANCE THAT THE UTILITY COMPANY SUPPLYING THE MINE WAS FACED WITH A SEVERE COST PENALTY FOR EVEN SHORT INTERRUPTIONS OF POWER.

TWO VENTILATION FANS WERE PROVIDED, ONE AT THE MILL END OF THE TUNNEL AND THE OTHER AT THE PIUTE OR FAR END OF THE TUNNEL. VENTILATOR SHAFTS WERE SIMILAR IN NATURE; EACH STARTING SEVERAL HUNDRED FEET ABOVE THE TUNNEL AND ANGLING DOWN TO MEET THE MAIN TUNNEL SOME 300 FEET BACK FROM THE PORTAL. PIUTE WAS LOCATED SOME 400 FEET ABOVE THE MAIN TUNNEL WHILE THE MILL SITE WAS POSSIBLY 100 FEET ABOVE THE TUNNEL.

ABOVE DATA MAY BE USED TO GAIN A PICTURE OF WATER CONDITIONS IN THE MINE. IN THE FALL AND WINTER, SURFACE SUPPLY OF WATER DWINDLES AND WATER LEVEL IN MINE WORKINGS DROPS BELOW THE MILLSITE VENTILATOR OPENING. SEALING OF PORTAL WITH CLAY AND GRANITE ALLOWS A CONTINUED SEEPAGE FROM THE POOL IN THE MINE. MAIN TUNNEL AND ALL LOWER WORKINGS MAY BE CONSIDERED COMPLETELY FLOODED. LEAKAGE FROM MINE PORTAL IS DILUTED WITH SHALLOW SUB-SURFACE SPRING WATER AND CONCENTRATIONS OF CHEMICALS ARE NOT REPRESENTATIVE OF MAIN BODY OF WATER IN THE MINE.

IN THE SPRING, FISSURES AND SURFACE OPENINGS, SUCH AS ON THE CENTRAL AND PIUTE ORE BODIES, CONTRIBUTE SNOW MELT WATERS WHICH BRING UP THE LEVEL OF MINE WATER UNTIL OVERFLOW OCCURS AT THE MILL SITE VENTILATOR SHAFT. FIRST SPRING FLOW WILL BE WATER WHICH HAS BEEN IN CONTACT WITH ORE FOR SOME TIME, AND CHEMICALS SHOULD BE AT THE HIGHEST CONCENTRATION. ALSO INITIAL LEACHING OF SUB-SURFACE OXIDIZED ORES WILL CONTRIBUTE A MAXIMUM OF ACID SOLUBLE MINERALS. CONTINUED DILUTION WITH PERCOLATION WATERS WILL RESULT IN SOMEWHAT DIMINISHED CHEMICAL CONCENTRATIONS. AS SUMMER PROCEEDS, AND SNOW DISAPPEARS, SUPPLY OF WATER IS CUT OFF AND THE MINE POOL WILL EVENTUALLY DRAIN DOWN TO VENTILATOR SHAFT LEVEL, AND OUTFLOW WILL ESSENTIALLY CEASE.

30.

QUALITY OF MINE WATERS:

WATERS IN THE WALKER MINE AREA WERE SAMPLED ON JUNE 17 AND 25, 1957, WITH THE FOLLOWING RESULTS:

DATE	SAMPLE LOCATION	FLOW CFS	pH	COND. MMHO	APPEAR.	Cu	Zn	SO_4	Al	CLASSIFICATION
6-25	UPPER SPRINGS	1.0	7.6	107	CLEAR	.01	.02	0.0	0.00	EXCELLENT
6-25	MINE TUNNEL	0.1	4.6	259	CLEAR	12	3.2	105	0.94	TOXIC
6-25	VENTILATOR SHAFT	0.5	3.7	328	CLEAR	22	5.5	125	3.1	TOXIC
6-25	WALKER CREEK- ABOVE MINE WASTE	0.5	7.8	96	CLEAR	.01	.02	0.0	0.00	EXCELLENT
6-25	WALKER CREEK- BELOW MINE WASTE	2.0	7.5	135	SLIGHT TURBID BLUE CAST	0.27	.12	37	0.00	TOXIC
6-25	L. GRIZZLY CRK. @ BROWNS CABIN	4.5	7.8	102	SLIGHT TURBID	0.32	.08	9.6	0.00	TOXIC
6-17	INDIAN CREEK 1 MI. BELOW L. G. CRK.	30	7.1	113	CLEAR	0.05	.03	6.7	0.08	EXCELLENT

IT WILL BE NOTED THAT VENTILATOR SHAFT DISCHARGES THE MAJOR PORTION OF MINE WASTES, WITH THE HIGHEST CONCENTRATION OF COPPER, NAMELY 22 PPM. UNITED STATES PUBLIC HEALTH SERVICE LIMIT ON COPPER, DRINKING WATER STANDARDS, IS NOW 3 PPM, BUT COPPER AT 0.1 PPM MAY SERIOUSLY DAMAGE MICROORGANISMS IN WATERS. WATERS IN THE AREA MAY GENERALLY BE CLASSIFIED AS SOFT, WHICH IS UNFORTUNATE AS HARD WATERS TEND TO NEUTRALIZE THE TOXIC EFFECTS OF COPPER. COPPER CARBONATE (MALACHITE OR AZURITE) IS QUITE INSOLUBLE.

IT IS INTERESTING TO NOTE THE FORMATION OF THESE MINERALS BELOW THE WASTE ROCK PILE AT THE MINE, WHERE SPRING WATERS AND MINE WATERS COMBINE. THE COATING OF THESE BLUE MINERALS ON THE STREAM BOTTOM PROVIDES A STRIKING EFFECT.

SAMPLES OF AREA WATERS WERE AGAIN COLLECTED ON OCTOBER 5, 1957. AT THIS TIME THE VENTILATOR SHAFT FLOW HAD DRIED UP AND ONLY 5 TO 10 GPM WASTES WERE OBSERVED AT TUNNEL PORTAL. DATA FROM THESE SAMPLES ~~WILL BE AVAILABLE AT A LATER DATE.~~ show little or no changes from June Conditions

TO PROVIDE A COMPLETE PICTURE OF MINE WATER QUALITY, PERIODIC SAMPLING, AT LEAST ON A MONTHLY BASIS, SHOULD BE MADE THROUGH ONE CALENDAR YEAR. SAMPLER SHOULD ESTIMATE FLOW FROM THE TUNNEL, VENTILATOR SHAFT, AND GRIZZLY CREEK AT THE TIME OF SAMPLING. THESE SAMPLES MAY BE OBTAINED BY LOCAL WARDENS AND TRANSMITTED TO THIS OFFICE FOR FURTHER HANDLING.

POSSIBLE CONTROL MEASURES

CONTROL MEASURES MUST BE AIMED AT MAINTAINING CONCENTRATIONS OF TOXIC MATERIALS BELOW THRESHOLD LEVEL OF DAMAGE TO AQUATIC LIFE. IN THE CASE OF COPPER MINES, THIS NORMALLY RESOLVES INTO CONTROL OF COPPER, ZINC, IRON AND ACID VALUES. CONTROL MEASURES MAY BE GROUPED INTO THREE GENERAL CATEGORIES:

A) PREVENT OUTFLOW OF MINE WATER;
B) MINIMIZE SOLUTION OF TOXIC MATERIALS;
C) TREAT MINE OUTFLOW.

ITEM A MAY BE REALIZED BY SEALING OFF EXITS AND PREVENTING ACCESS OF WATERS TO MINERAL DEPOSITS. NEITHER OF THESE SEEMS FEASIBLE IN THE WALKER MINE CASE, THE MAIN ROCK TUNNEL BEING INACCESSIBLE AT THE PRESENT TIME, AND WATERS ENTERING THE MINE THROUGH NUMEROUS FISSURES AND OPENINGS.

ITEM B IS USUALLY ACCOMPLISHED BY LIMITING AIR CONTACT AND PROVIDING A GAS-TIGHT WATER DRAIN SYSTEM. DUE TO THE TREMENDOUS UNDERGROUND WORKINGS, AND THE POSSIBILITY OF MYRIAD OPENINGS FOR ENTRANCE OF AERATED SURFACE WATERS, LIMITING OF AIR CONTACT DOES NOT APPEAR WORKABLE.

C TREATMENT OF MINE WASTES THUS APPEARS TO BE THE ONLY FEASIBLE APPROACH. ECONOMIC RECOVERY OF COPPER IS NOT CURRENTLY POSSIBLE, AT MARKET PRICES FOR COPPER. IT MAY BE STATED THAT THE AGE-OLD RECOVERY OF COPPER BY IRON CONTACT LEAVES AN EFFLUENT LADEN WITH IRON AND ZINC, AND IS NOT ALWAYS A SATISFACTORY SOLUTION TO THE WATER POLLUTION PROBLEM.

ISOLATION OF MINE WATERS AND DISSIPATION OF TOXIC MATERIALS BY PERCOLATION, EVAPORATION, AND AIR OXIDATION APPEAR TO MERIT FURTHER STUDY IN THIS CASE. TASK WOULD APPEAR TO BE ACCOMPLISHED WITH MINIMUM OUTLAY THROUGH UTILIZATION OF AN OLD DIVERSION CHANNEL. THIS UNDERTAKING WOULD PRODUCE NO DIRECT BENEFITS TO MINE OWNERS, BUT WOULD RESTORE CONSIDERABLE RECREATION VALUES TO PLUMAS COUNTY.

CONSIDERING THE RESPONSIBILITY OF MINE OWNERS UNDER CALIFORNIA LAW, AND THE BENEFIT TO PLUMAS COUNTY RESULTING FROM RESTORATION OF LITTLE GRIZZLY CREEK TO A RECREATIONAL AREA, IT IS LOGICAL THAT THESE TWO COULD COOPERATIVELY ACT TO REMOVE TOXIC WASTES FROM LITTLE GRIZZLY. MINE OWNERS COULD PROVIDE FLUME OR PIPE TO CONVEY ACID WATERS SOME 1000 FEET TO THE CANAL, AND COUNTY COULD ASSUME YEARLY MAINTENANCE OF FACILITIES, USING THE FINE FUND ACCUMULATED FOR JUST SUCH PURPOSES.

SUPERVISOR HUMPHREY HAS INDICATED THE PLUMAS COUNTY BOARD WOULD LOOK FAVORABLY ON SUCH A PROGRAM. THE FINE FUND, WHICH MAY BE USED FOR SUCH PURPOSES, CURRENTLY SHOWS A TOTAL OF $9000.00.

Walker Mine

4. A TAILINGS AREA:

4A. A DESCRIPTION of area

TAILINGS FROM THE MILL WERE IMPOUNDED IN A NATURAL BASIN ABOUT 0.5 MILE BELOW THE MINE PORTAL. AREA IS A BROAD FAN COVERING SOME 100 ACRES, WITH TAILINGS DEPTH ESTIMATED AT 0 TO 20 FEET.

LITTLE GRIZZLY CREEK IS HELD AGAINST THE SOUTHWESTERN BOUNDARY OF THIS BASIN BY A LEVEE SOME 1/2 MILE IN LENGTH. LEVEE ALSO CONTAINS THE TAILINGS, EXCEPT FOR ONE MAJOR BREAK IN THE CENTRAL PORTION. WALKER CREEK SPREADS OUT ON THE WESTERN PORTION OF THE TAILINGS AND THEN COLLECTS TO SPILL OVER A RETAINING DAM LOCATED AGAINST THE NORTHERN HILLSIDE AND AT THE FAR WESTERN REACH OF THE TAILINGS AREA.

TAILINGS POND DAM CONSISTS OF A 10 FOOT HIGH CONCRETE WALL SOME 20 FEET ACROSS SURMOUNTED BY 3 FEET OF WOOD TIMBERS. ENTIRE STRUCTURE IS TIETED OUTWARD AND APPEARS IN DANGER OF COLLAPSING.

EFFORTS MADE IN 1952 TO REPAIR THE BREAK IN THE CENTRAL LEVEE WALL FAILED TO HOLD, AND RUN-OFF WATERS HAVE ERODED SEVERAL RAVINES IN THE TAILINGS AT THIS POINT. TROUT AND BEAVER EXIST BELOW THIS POINT, HOWEVER, INDICATING THAT SILT AND WASH WATER THEREFROM ARE NOT TOXIC TO AQUATIC LIFE. THUS PRIMARY POLLUTANT WOULD APPEAR TO BE TOXIC CHEMICALS CONTRIBUTED BY MINE WATERS.

MAJOR ADVERSE EFFECTS OF SILTATION WOULD APPEAR TO BE THE SMOTHERING OF TROUT EGGS AND BOTTOM LIFE, AND THE DESTRUCTION OF ADEQUATE COVER FOR FISH. BEAVER HAVE NOW DESERTED THE AREA, APPARENTLY UNABLE TO COPE WITH THE YEARLY SILTATION OF THEIR PONDS.

TO COMPLETE THE CHEMICAL BACKGROUND OF AREA WATERS, A HIGH SPOT WAS LOCATED ON THE TAILINGS BED, AND A SAMPLE COLLECTED SOME 12 INCHES UNDER THE SURFACE. SAMPLE WILL BE LEACHED AND THE FILTRATE ASSAYED FOR HEAVY METALS PLUS XANTHATES AND CYANIDE.

POTASSIUM XANTHATE IS A FLOTATION CHEMICAL, AND ALONG WITH CYANIDE AND LIME, WAS USED DURING THE OPERATION OF THE WALKER MINE MILL. XANTHATE IS TOXIC TO PLANKTON AT 0.01 PPM, BUT IS SUBJECT TO DECOMPOSITION UPON AGING. IT IS NOT EXPECTED TO FIND ANY OF THIS REAGENT IN THE TAILINGS. U.S.G.S. WILL ATTEMPT A COLORIMETRIC QUALITATIVE DETERMINATION FOR THIS MATERIAL.

ATTEMPTS TO ESTABLISH PLANT GROWTH, ON THIS MATERIAL, BY THE UNIVERSITY OF CALIFORNIA, FAILED, EVEN WITH FERTILIZATION. AN ANALYSIS OF SOLUBLE CHEMICALS MAY BE OF ASSISTANCE TO THE U.S. FOREST SERVICE IN ESTABLISHING A STABILIZING GROUND COVER ON THE TAILINGS AREA.

48 B OWNERSHIP of Tailings

MR. R. L. ALLEN, POST OFFICE BOX 347, PORTOLA, CURRENTLY CLAIMS TO OWN MINING CLAIMS COVERING THE ENTIRE TAILINGS AREA. HE STATES THAT AFTER SEVERAL YEARS EXPERIMENTATION, HE NOW HAS A PROCESS CAPABLE OF RECOVERING GOLD AND SILVER VALUES FROM THIS MATERIAL, AND PLANS TO SET UP OPERATIONS IN 1958. MR. ALLEN WAS INFORMED THAT, UNDER CALIFORNIA LAW, THE OWNER OF A PROPERTY WAS RESPONSIBLE FOR DISCHARGES THEREFROM. A COPY OF THE LAW AND DISCHARGE REPORT FORMS WERE LEFT WITH MR. ALLEN.

SURVEY OF RECORDS IN PLUMAS COURTHOUSE FAILED TO SHOW ALLEN AS OWNER ON CLAIMS, BUT IT IS INDICATED HE HAS LEASED CLAIMS FROM ROBERT R. BARRY. IN A DISCUSSION WITH R. P. WILSON, WILSON INDICATED THAT HE CONSIDERS THE TAILINGS AS HIS PROPERTY, AND THAT BARRY DOES NOT HAVE THE AUTHORITY TO LEASE A CLAIM THEREON.

CONSULTATION OF COUNTY RECORDS AGAIN REVEALED THAT BOTH BARRY AND WILSON HAVE CONSISTENTLY FILED SEPARATE ASSESSMENT WORK NOTICES ON WALKER MINE CLAIMS. SOME 300 OR MORE CLAIMS ARE LISTED, AND IT WAS PRESUMED THAT THE TAILINGS AREA IS INCLUDED AMONG THESE CLAIMS.

MR. GEORGE A. FISHER, IN CHARGE OF LAND USES, RANGE AND WILDLIFE SERVICE, PLUMAS NATIONAL FOREST, WAS CONSULTED. HE RECOGNIZES A LIMITED RESPONSIBILITY OF THE FOREST SERVICE IN CONTROLLING DISCHARGES FROM THE TAILINGS AREA. WASTES WERE APPARENTLY ORIGINALLY DEPOSITED HERE THROUGH A "USE PERMIT" ISSUED BY THE NATIONAL FOREST SERVICE. LAND SHOWS ON COUNTY ASSESSORS MAP AS BELONGING TO THE FOREST SERVICE.

IN THE ABSENCE OF ACTIVE UTILIZATION OF DEPOSITS, IT WOULD APPEAR THAT AREA JURISDICTION AND RESPONSIBILITY FOR CONTROL OF SILT DISCHARGE RESIDE WITH THE PLUMAS NATIONAL FOREST ADMINISTRATION.

40 C Possible SILT CONTROL MEASURES:

IT WOULD APPEAR THAT SILT OUTFLOW MIGHT BE CONTROLLED BY CONSTRUCTION OF AN ADEQUATE DAM AT THE LOWER END OF THE POND, AND BY THOROUGH REPAIR OF LEVEE BREAKS WITH PROVISION FOR DISPOSAL OF STORM WATERS TO WALKER CREEK, OR PERHAPS SOUTHEASTERLY TO LITTLE GRIZZLY CREEK ABOVE THE TAILINGS AREA. INITIAL COST OF SUCH PROGRAM ESTIMATES AT $30,000.00 WITH YEARLY MAINTENANCE COSTS AT PERHAPS 500 TO $1,000. THIS METHOD WOULD INTERFERE WITH ANY ATTEMPT TO PROCESS TAILINGS.

ANOTHER POSSIBILITY, AS OUTLINED BY MR. FISHER, WOULD BE TO EMPLOY A BULL-DOZER AND CARRY-ALL TO EXCAVATE TAILINGS DOWN TO THE ORIGINAL SOIL, AND TO THEN REMOVE THE EXISTING DAM COMPLETELY. STABILIZATION OF STREAM BANKS WOULD REQUIRE ROCK RIP-RAP, PLANT COVER, OR CONCRETING TO PREVENT SLOUGHING OFF OF TAILINGS INTO WALKER CREEK. TAILINGS THEMSELVES WOULD SUPPLY MIX FOR CEMENTING, A SIMILAR TAILINGS MATERIAL NOW BEING USED FOR GROUTING OF WATER TRANSPORT TUNNELS.

SOLUTION OF THIS PROBLEM WOULD APPEAR TO REQUIRE A COOPERATIVE APPROACH BETWEEN THE FOREST SERVICE AND PLUMAS COUNTY.

2 cont'd

Insert #5

5. PROGRAM FOR WALKER-MINE ~~CLEAN-UP~~ Solution

RESTORATION OF LITTLE GRIZZLY CREEK AS A RECREATIONAL AREA, AND PROTECTION OF IRRIGATION AND RECREATIONAL WATER USES IN INDIAN VALLEY, REQUIRES ACTION ON TWO SEPARATE PROBLEMS.

A) CONTROL OF TOXIC MINE WASTES:

TOXIC MINE WASTE APPEARS TO BE THE PRIMARY AND MAJOR POLLUTANT AT THIS TIME. ABATEMENT SHOULD PROCEED ON SEVERAL FRONTS:

a) ESTABLISH SAMPLING PROGRAM TO MORE FULLY ASCERTAIN EXTENT OF COPPER POLLUTION PROBLEM.

b) PROCEED WITH REQUIREMENTS AND NEGOTIATIONS WITH CURRENT OWNERS OF MINE (ROBERT R. BARRY) TO DIVERT MINE WATERS TO IRRIGATION CANAL.

c) MEET WITH PLUMAS COUNTY BOARD OF SUPERVISORS, AND THE NATIONAL FOREST SERVICE WHO OWN THE CANAL, TO ESTABLISH A CANAL AND DIVERSION MAINTENANCE SCHEDULE.

B) CONTROL OF SILT DISCHARGE:

PRIMARY PROBLEM HERE APPEARS TO BE THE ESTABLISHMENT OF AUTHORITIES AND LIABILITIES INVOLVED IN THE TAILINGS AREA. ATTORNEY-GENERAL'S OPINION WOULD SEEM TO BE REQUIRED TO ESTABLISH PRIMARY RESPONSIBILITY FOR AREA EITHER WITH FOREST SERVICE OR WITH CLAIM HOLDER; AND IF FOREST SERVICE HAS JURISDICTION, WHAT ARE ITS DUTIES AND OBLIGATIONS TOWARDS CLAIM HOLDERS?

REQUIREMENTS SHOULD BE ESTABLISHED UPON TAILINGS AREA, AND THE RESPONSIBLE PARTY, AS DESIGNATED BY ATTORNEY-GENERAL, BE SERVED THEREWITH. AS SEVERAL PARTIES BENEFIT FROM SILT CONTROL, AND CONTROL MAY PROVE RATHER COSTLY, JOINT DISCUSSIONS SHOULD BE HELD TOWARDS DEVELOPING COOPERATIVE CONTROL ACTION.

Exhibit 33

RESOLUTION
WASTE DISCHARGE REQUIREMENTS
WALKER MINE, PLUMAS COUNTY

RESOLUTION NO. 58- 180 ADOPTED: April 24, 1958

WHEREAS, WALKER MINE IS AN INOPERATIVE COPPER MINE LOCATED IN PLUMAS COUNTY; AND

WHEREAS, THE WALKER MINE IS CURRENTLY UNDER THE JURISDICTION OF ROBERT R. BARRY, 29 HEREFORD ROAD, BRONXVILLE, NEW JERSEY; AND

WHEREAS, WATERS DRAINING FROM THE MINE HAVE BEEN FOUND TO BE, AT TIMES, HIGHLY ACID AND MINERALIZED; AND

WHEREAS, DRAINAGE FROM THE WALKER MINE ENTERS DOLLIE CREEK; AND

WHEREAS, DOLLIE CREEK DRAINS ACROSS THE WALKER MINE TAILINGS TO ENTER LITTLE GRIZZLY CREEK; AND

WHEREAS, LITTLE GRIZZLY CREEK FLOWS SOME 10 MILES THROUGH NATIONAL FOREST GROUND TO ENTER INDIAN CREEK; AND

WHEREAS, INDIAN CREEK TRAVERSES INDIAN VALLEY TO DRAIN INTO EAST BRANCH NORTH FORK FEATHER RIVER; AND

WHEREAS, WATERS OF LITTLE GRIZZLY CREEK AND INDIAN CREEK ARE USED FOR DOMESTIC SUPPLY, IRRIGATION, STOCK WATERING, LIGHT INDUSTRY, POWER GENERATION, AND MINING; AND

WHEREAS, WATERS OF INDIAN CREEK ARE ALSO USED FOR FISHING, CAMPING, SWIMMING, AND PICNICKING; AND

WHEREAS, LITTLE GRIZZLY CREEK WATERS DOWNSTREAM FROM THE CONFLUENCE WITH DOLLIE CREEK ARE SAID TO HAVE BEEN USEFUL FOR FISHING AND RECREATION AT ONE TIME, BUT THESE USES IN RECENT YEARS HAVE BEEN DESTROYED BY UNCONTROLLED DRAINAGES FROM THE WALKER MINE AND THE WALKER MINE TAILINGS; AND

WHEREAS, RESTORATION OF THE FISHING AND RECREATIONAL POTENTIAL OF LITTLE GRIZZLY CREEK, AND PROTECTION AND PRESERVATION OF THE FISHING AND RECREATIONAL USES OF INDIAN CREEK ARE OF ECONOMIC CONCERN; AND

WHEREAS, IT IS THE INTENT OF THE CENTRAL VALLEY REGIONAL WATER POLLUTION CONTROL BOARD TO PROTECT THE EXISTING BENEFICIAL USES OF INDIAN CREEK WATERS; AND TO RESTORE THE BENEFICIAL USES OF LITTLE GRIZZLY CREEK WHERE ECONOMICALLY FEASIBLE; AND

WHEREAS, SECTION 13053, DIVISION 7, CALIFORNIA WATER CODE, PROVIDES THAT EACH REGIONAL BOARD SHALL PRESCRIBE REQUIREMENTS RELATIVE TO ANY PARTICULAR CONDITION OF POLLUTION OR NUISANCE, EXISTING OR THREATENED, IN THE REGION; THEREFORE BE IT

RESOLVED, THAT THE FOLLOWING REQUIREMENTS SHALL GOVERN THE NATURE OF DRAINAGE FROM WALKER MINE TO DOLLIE CREEK AND THENCE INTO LITTLE GRIZZLY CREEK:

1. DRAINAGE SHALL NOT CAUSE SLUDGE DEPOSITS IN RECEIVING WATERS.
2. DRAINAGE SHALL NOT CAUSE UNDUE COLORATION IN RECEIVING WATERS.
3. DRAINAGE SHALL NOT CAUSE CONCENTRATIONS OF MATERIALS IN RECEIVING WATERS WHICH ARE DELETERIOUS TO HUMAN, PLANT, ANIMAL OR AQUATIC LIFE.
4. DRAINAGE SHALL NOT CAUSE A NUISANCE DUE TO ODORS OR UNSIGHTLINESS.
5. DRAINAGE SHALL NOT CAUSE pH OF RECEIVING WATERS TO FALL BELOW 6.5, NOR TO EXCEED 8.5.

IF THERE IS ANY FUTURE CHANGE IN THE CONDITIONS OR USE OF THE DISPOSAL AREA IT MAY BE NECESSARY FOR THE CENTRAL VALLEY REGIONAL WATER POLLUTION CONTROL BOARD TO MODIFY THESE REQUIREMENTS TO CONFORM TO THE NEW CONDITIONS OR USE.

THESE REQUIREMENTS DO NOT AUTHORIZE THE COMMISSION OF ANY ACT RESULTING IN INJURY TO THE PROPERTY OF ANOTHER OR PROTECT THE DISCHARGER FROM HIS LIABILITIES UNDER FEDERAL, STATE OR LOCAL LAWS.

CLIFFORD E. PLUMMER, CHAIRMAN

REGIONAL WATER POLLUTION CONTROL BOARD
CENTRAL VALLEY REGION
STATE OF CALIFORNIA

ATTEST:

JOSEPH S. GORLINSKI, EXECUTIVE OFFICER

Exhibit 34

Central Valley Regional Water Quality Control Board Proceeding

Item 15 - 03/28/14

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CONDENSED TRANSCRIPT AND CONCORDANCE
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CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD
ITEM 15
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MARCH 28, 2014
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Page 0

APPEARANCES

BOARD MEMBERS
Mr. Karl Longley, Chairperson
Ms. Jenny Moffitt, Vice Chairperson
Ms. Sandra Meraz
Ms. Carmen Ramirez
Mr. Robert Schneider

STAFF
Ms. Pamela Creedon, Executive Officer
Mr. Kenneth Landau, Assistant Executive Officer
Mr. Andrew Altevogt, Assistant Executive Officer
Mr. Clay Rodgers, Assistant Executive Officer
Mr. Alex Mayer, Staff Counsel
Mr. David Coupe, Staff Counsel
Mr. Patrick Palupa, Staff Counsel

ALSO PRESENT
Andrew Tauriainen, State Water Resources Control Board
William Duffy, Davis, Graham and Stubbs
Andrea Wang, Davis, Graham and Stubbs
James Bruen, Farella, Braun and Martel

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PROCEEDINGS

CHAIRPERSON LONGLEY: Thank you very much. We'll now go back to Item 15, which was continued from yesterday.

LEGAL COUNSEL MAYER: And Dr. Longley, since we have a new court reporter today, if any parties are going to address the Board, if they could they introduce themselves prior to doing so.

CHAIRPERSON LONGLEY: Say again, please, I am sorry.

LEGAL COUNSEL MAYER: Since we have a new court reporter that is different from yesterday, if any of the parties are going to address the Board, if they could reintroduce themselves for the record.

CHAIRPERSON LONGLEY: Thank you very much.

LEGAL COUNSEL MAYER: For the record. Alex Mayer, staff counsel. I've already introduced myself to the court reporter, and that's how I know this information.

CHAIRPERSON LONGLEY: So, Mr. Duffy, go ahead.

MR. DUFFY: Good morning, Dr. Longley and members of the Board. Appearing for Atlantic Richfield Company today are William Duffy and Andrea Wang the law firm of Davis, Graham, and Stubbs from Denver, Colorado. And with us today at counsel table is James Bruen of Farella,

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Braun, and Martel in San Francisco.

EXECUTIVE OFFICER CREEDON: Mr. Duffy, I know it's been a late night probably for you, but we need to have you move closer to the microphone.

MR. DUFFY: Thank you. I don't have any opening comments other than it was a late night, thank you. Ms. Wang is going to, I believe, respond to comments. We're assume there's going to be more presentation of information by counsel, Mr. Coupe. Is that how we're going to proceed this morning?

CHAIRPERSON LONGLEY: Well, yes. The hearing was closed out. I'll go ahead and reopen it. If you have anything new to introduce, very specifically on the one ruling that I made yesterday, if you have something new to present on that, we will consider that. And that's, of course, the ruling on the exhibits that I kept out of the record.

MS. WANG: Thank you, good morning. Andrae Wang for Davis, Graham and Stubbs. I was able to research that issue, and I can update the Board on that. We'd also like the opportunity, when it's convenient for the Board, to make a few comments on a draft CAO that Mr. Coupe circulated last night. I know you have a full docket today, so I promise to limit my comments to about three minutes. But we would like the opportunity to make a

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brief record on that.
Turning to the question of the exhibits: We were able to get in touch with our office last night, and we have confirmed that we inadvertently failed to include Exhibits 263 to 293 in the Board materials. I'd like to apologize for that. As I mentioned, it was inadvertent. Had we known of the error, we absolutely would have made every effort to get them to the Board before this hearing. I understand that Mr. Tauriainen knew of this error on February 27th but chose not to tell us about it. I would also just add that I don't believe that this error prejudices the prosecution team, as again we did provide them to the prosecution team on February 27th. Mr. Tauriainen did not to respond to that email to complain in anyway. Thank you.
CHAIRPERSON LONGLEY: Thank you very much. And Mr. Duffy, as to your request to speak to the draft, that draft may not be what finally comes out from this Board. I reopened the discussion. I had closed the hearing and had limited discussion to members of the Board. And I will close it again, and we will see what comes out of that. You heard our discussion yesterday and probably have some idea of the direction that we're going. We have yet to kind of reach a final decision of where we are going to go, so I think it is premature at this point to

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allow a discussion, and I'm not really sure that I'll entertain that idea anyway.
MS. WANG: Okay, thank you. And one practical thing we would like to address, if the Board wishes, is some of the deadlines in the draft. There's just some practical considerations that we would like just a moment to talk about whenever you are ready for that.
CHAIRPERSON LONGLEY: Okay, I'll consider that, but I don't think we're at that point yet. And I'll close the record at this point and go back.
At this point we have a motion, and we were discussing that motion yesterday. And we really need to find out where this Board is going. Bob had his motion on the table. It included both of the cleanup and abatement orders. He made other comments that I said that I supported. And the -- but I said that I would like to see the order contain only the mine, and I'm not going to speak for -- and Bob, you can obviously expand on that.
BOARD MEMBER SCHNEIDER: Karl, for the start of the day, I'd like to withdraw that motion and begin a fresh one. And I would like to say a little preface that it's my -- certainly we all know that ARCO is not directly as a company responsible for this. They purchased a company, Anaconda, and with that they purchased a lot of assets and they assumed liabilities. But there is -- you

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know, there's always this responsible-party issue of the fact that ARCO is the parent company here now. It wasn't directly involved in the mining, but they did buy that asset of Anaconda. So I do think it's important to recognize the situation and frame it in that regard. Anaconda, they purchased it because has a lot of assets, but like I say, there is also these liabilities, and that's what we're dealing with today.
CHAIRPERSON LONGLEY: Thank you. And Jenny and Carmen, you had comments. Do you want to restate them, update us on where you are at this point.
VICE-CHAIR MOFFITT: Do you want me to go first?
BOARD MEMBER RAMIREZ: Okay, you can go first.
VICE-CHAIR MOFFITT: I guess the comments that I had made yesterday were -- there were, I guess, a couple questions that the prosecution team had to answer, and I felt that the prosecution team had, that I was satisfied with the arguments that I heard yesterday on the prosecution team's side, which was that there was -- there is certainly a water quality impact coming from the mine and the tailings into the streams and tributaries, and it does need to be addressed. And secondly, that it is very clear in the evidence that I saw that there was a very direct communication and correlation between International, which was owned by Anaconda and now is

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owned by ARCO, and their involvement in disposing of those wastes that are now causing the pollution.
So those are just basically the comments that I had made yesterday that I felt were very compelling, and that's it. And I do agree with the comment that Bob just made this morning that ARCO purchased an asset that also has some liabilities, and this is, apparently, one of those liabilities. Thank you.
CHAIRPERSON LONGLEY: Carm.
BOARD MEMBER RAMIREZ: My comment relates to this case but is more in general, and just thinking about it took me all the way back to law school. And that's that it's important that the responsible parties be identified, I agree. But there's also an important principal for business to be able to quantify their risk and be able to move forward. And, you know, statute of limitations in civil cases does that. But here we are arguing about something that happened almost a hundred years ago. We're trying to piece things together. And even though I understand insurance archaeology and I know that that is available sometimes, you know, cases like this do trouble me.
It's a hundred years old, but having said that I understand that it comes along with buying something. But just for -- just so that I can get it out, it just seems

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in principal difficult to see that, you know, ARCO is moving along, doing well, and then you find out that a company that you bought way back when, you know, did bad things way back then and now you're on the hook here. So I do see that they are on the hook. I just -- I don't know. I guess in some ways it seems like it's been a long time.

CHAIRPERSON LONGLEY: Well, I would entertain a motion at this time.

LEGAL COUNSEL COUPE: Dr. Longley, if it pleases the Board we could certainly hand out copies of the suggested proposed revisions by the advisory team, and we could walk through those, if you'd like, and also hear comment.

CHAIRPERSON LONGLEY: Well, let's see if we have a motion. That, I think, would be proper after we have a motion on table.

BOARD MEMBER SCHNEIDER: Could you tell us where you are and why first, Karl?

CHAIRPERSON LONGLEY: I would like to see a motion on the -- as I stated yesterday, I would like to see a motion on the mine, a cleanup and abatement order to the mine. Without prejudice to any future actions, I would prefer to see the tailing site be addressed by the actions which I understand are now under way by the Forest

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Service. Those actions, if they can reach a favorable conclusion when executed -- certainly under CERCLA, it would address the tailing site. And at this time with this cleanup and abatement order, we could address the mine.

VICE-CHAIR MOFFITT: The Forest Service is not here today. They were here yesterday. I am just clarifying that they are not here. Before we move forward in the direction you are proposing, I would prefer to hear something from the Forest Service that we have some sort of acknowledgement and agreement that they understand that they are under the fire to continuing moving forward in the CERCLA process.

CHAIRPERSON LONGLEY: We have the letter that was read into the record yesterday by Mr. Coupe.

LEGAL COUNSEL COUPE: Right. It wasn't specificaliy read into the record, but it was specifically referenced. And I pulled out some specific information from that email that specifically says that the Forest Service is working on a focused feasibility study which will result in either a new record of decision or an amended record of decision. The email, as I understand it, does recognize that there are continuing water quality problems out there, and that they are not waiting for the five-year review process under CERCLA to amend the record

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of decision. And at least according to them, they believe that they will be working expeditiously in an effort to address the mine tailing site through, again, a revised CERCLA document in consultation with other public agencies, including the Regional Board.

BOARD MEMBER SCHNEIDER: Karl, would this go forward in two motions then? One motion on the mine, and one to somehow provide a marker that we're specifically not taking action at this point in time but we hold open our options with respect to tailing.

CHAIRPERSON LONGLEY: Certainly a motion on the CAO for the mine. Following up on the second one, would we want to do -- the question is would we want to do a resolution?

BOARD MEMBER SCHNEIDER: I just want to memorialize this.

CHAIRPERSON LONGLEY: That's right.

LEGAL COUNSEL COUPE: Dr. Longley, what we tried to do in the revised -- again, they are just only suggested findings for the Board's consideration -- is to make it clear in the revisions that the Board was only acting as to the mine site itself. It wasn't taking any specific action as to the tailing site, but that it was reserving its authority if needed in the future to pursue necessary enforcement action as to the tailing site.

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BOARD MEMBER SCHNEIDER: Can we get copies of that?

CHAIRPERSON LONGLEY: Yeah, let's hand out the copies now.

BOARD MEMBER SCHNEIDER: And then let's walk through it.

CHAIRPERSON LONGLEY: I was hesitant to have the copies handed out until we had a motion here simply because it pertains specifically to the mine site.

BOARD MEMBER SCHNEIDER: And I'm happy to make a motion with respect to the mine site as long as these suggested changes can be memorialized.

CHAIRPERSON LONGLEY: Good. That's the direction we are going.

BOARD MEMBER RAMIREZ: Is this the draft CAO that counsel was talking about?

LEGAL COUNSEL COUPE: This is a version of the latest cleanup and abatement order that the prosecution team had circulated -- the advisory team -- in response to a request that we made a couple of days ago. And in response to getting those word versions, in anticipation of arguably or possibly having to make some changes to those orders that's -- this version reflects the latest and greatest version.

CHAIRPERSON LONGLEY: We will work our way

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through this. And if we are going to adopt this, before we do adopt it, I'll honor ARCO's request and open up discussion specifically for timelines and timelines only.

BOARD MEMBER RAMIREZ: ARCO has seen this already?

LEGAL COUNSEL COUPE: Dr. Longley, the order was sent out last night to the parties about 7:30 or so. You're certainly free to take whatever comment you may or may not want to take. My suggestion is there may be some benefit or value in giving the parties, you know, at least a few minutes to make some specific comments on the proposed order if that is the direction the Board is inclined to go given the fact that the revisions were circulated last night about 7:30.

CHAIRPERSON LONGLEY: I'll take your recommendations under advisement. Let's go through this now.

LEGAL COUNSEL COUPE: In response to -- the first change itself pertains to Finding 4 on page 1. Again, that's an effort in the advisory team's mind to more closely align the language of the finding consistent with the Supreme Court decision in U.S. v. Bestfoods.

The finding in page 8 is an effort that you'll see later on in the order to make a distinction between the Walker Mine site itself, which is the subject of this

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cleanup and abatement order, and the tailing site itself. The last sentence in Finding 8 is not highlighted on your draft because you don't have a color draft, but it was highlighted to the parties and I have the benefit of a colored copy. But that last sentence was highlighted because, quite frankly, we weren't sure what direction the Board wanted to take in this regard. So if the Board is inclined to only consider the adoption of a mine site cleanup and abatement order, then my suggestion would be to strike the last sentence in Finding 8.

Moving on to page 6 of the proposed order, this is in response to a comment that Atlantic Richfield had made in response to the order. And we made a change accordingly in response to that request, specific request, that Atlantic Richfield made in Finding 33 on page 6.

Moving to the bottom of page 6, Finding 36: Again, that's additional language to create a finding that we think is a bit more in line with the US Supreme Court president in United States v. Bestfoods. And we struck the specific reference to substantial evidence as Mr. Mayer pointed out to me in response to Prehearing Motion No. 6 that you ruled on yesterday pertaining to the evidentiary burden.

The next suggested finding, 36 moves onto page 37, where we have added some additional language to

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specifically point out evidence in the record that would support Anaconda International's control over the pollution-related activities at the site. 37 is just a -- we feel like the first sentence could be stricken. There's plenty of previous findings in that regard as to Anaconda International's pollution-causing activities at the mine. And in particular it makes a specific reference -- it appears to make a specific reference to the mine tailing site, and we want to make it clear that we're trying to adopt an order here in this case specific to the mine itself.

Moving on to Finding 39: Minor change, but I think -- I am not sure if the Board necessarily wants to hamstring itself into the position of saying it absolutely will develop a TMDL for Dolly Creek and Grizzly Creek by 2020. We certainly plan or endeavor to do so. We've made just a suggested wordsmithing change in that regard.

Just a typo in Finding 42. And I'm going to ask Mr. Mayer to speak quickly in relationship Finding 51, and then I'll pick it up after that point.

LEGAL COUNSEL MAYER: Finding 51 is suggested in response to ARCO's argument in its opening brief. I believe it is regarding a particular section in the cleanup and abatement statute regarding acts that took place prior to enactment of the cleanup and abatement law

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and cites that provision word for word focusing on the idea that the abatement -- the statute does not apply, according to the terms of this provision, if the acts were not in violation of existing laws or regulations at the time they occurred.

Since most of the alleged activities took place prior to the '40s, or certainly prior to 1981, there's a need to affirm, to establish, the applicability of this 13304 code section for the proposed action. So there was information in the prosecution team rebuttal brief alleging that a condition of pollution, or a condition of public nuisance, existed during the time that these acts were taking place or shortly thereafter.

And this paragraph points back to a finding that's already in the order and talks about evidence regarding a ten-mile eradication of fish life downstream of the mine that is reported in the evidence. There's a Trumbull report that talks about this in detail and this finding links that evidence with the case law existing at that time regarding public nuisances and destruction of fish property. Interference with the property of the State, in fact, was considered a public nuisance at the time that these acts occurred. Therefore, with the finding that there was a public nuisance around the time of these acts, this finding would establish the

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applicability of Water Code Section 13304 to be able to go back in time prior to 1981.

CHAIRPERSON LONGLEY: Thank you.

LEGAL COUNSEL COUPE: So moving on to Finding 52, there's a suggestion revision to strike the change to restore the effected waters to, quote, background conditions, i.e., the water quality that existed before mining activities began. You'll see that same language reflected in Task No. 4 on page 11. And the reason why the prosecution team has made -- excuse me, that the advisory team has made the suggested change: It sounds like the order does cite the pertinent law that's appropriate for purposes of conducting a cleanup pursuant to 9249, but 9249 doesn't necessarily require a cleanup to background conditions. Certainly the presumption in 9249 is to clean up to background, but as referenced in earlier findings in the order, the order specifically recognizes that if there's a demonstration made that it's technologically and economically infeasible to clean up to background that some level greater than background may be permissible as long as it fully protects the beneficial uses.

So moving on from Finding 52, we'll go to Finding 54 on page 10. Finding 54 on page 10 addresses the prehearing motion that ARCO had raised, the defense of

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laches, and it's an effort to recognize that the equitable doctrine of laches generally does not apply, particularly in cases involving where the operation of laches, number one, is an equitable court-based remedy, and that its operation doesn't apply when it would nullify important policy adopted for the benefit of the public. And we make some specific findings in regard to why we think that an important public policy would be nullified by the operation of laches in this case.

We also make an additional finding that even evaluating for the sake of argument that ARCO arguably may have been prejudiced for the purposes of laches -- which that is a decision for you to make, which is why this is a suggested finding -- the finding recognizes that the Board balance the equities and finds that the strong public policy for environmental protection outweighs any alleged or purported prejudice that ARCO may have incurred.

Moving on to page 11, we struck the last sentence in Finding 7 making a specific -- excuse me, yes, Finding 57 on page 11. I'm not sure if the Board would entirely know what it would be doing if it was specifically incorporating all the findings in the response to comments by reference, so we struck that language as a suggestion. We fixed a typo.

Moving to the bottom of page 11, task four,

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again, this is just the same suggested change that I made that was made earlier pertaining to restoring the effected waters themselves, that it doesn't necessarily mean that cleanup has to be to background under 9249.

We're almost done. Moving on to page 13, Finding 11. We struck this language that says, "Responsibilities for the water quality problems associated with the mine and the Walker Mine acid mine drainage abatement project shall end when the mine no longer poses a threat to water quality." And, you know, we struck that language in part as a suggestion only because given how long it may take to remediate the site, there may be other appropriate regulatory approaches that the Board may decide to get involved with or take advantage of or avail itself of in the future pertaining to the mine site. For example, the Board may decide to dedesignate the uses as it pertains to the effected water bodies in light of the fact that the cleanup situation out there is so intractable that arguably it may never be fixed. But, again, I think until the tasks are submitted in compliance with the order itself, I think it would be premature for the Board to make any evaluation and determination about that at this time.

And following up on the tasks issue, I don't pretend to be an engineer or scientist or spend a lot of

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time with work plans, but we did have a member of the advisory team just flag to your attention the fact that there may be some benefit or value in arguably changing some of the dates as currently proposed in the cleanup and abatement order. Again, that's the Board's discretion, whatever they would like to do in that regard. We're just flagging that as something for their consideration.

Finding 11 on page 13, this is my perhaps inelegant effort to try and make it clear that the order is specific to the Walker Mine site itself and not to the tailing site and that it reserves the authority and puts everyone on notice that the order may be revised or another order may be issued as may be necessary to remediate conditions at the Walker Mine tailing site but that we're not doing so at this particular time.

And the last change is just to create a signature block for the assistant executive officer as member of the advisory team instead of head of the prosecution team. Thank you.

CHAIRPERSON LONGLEY: Thank you very much. Another item is Mr. Schneider pointed out that he believed, and I concur with his belief, that we need to send a strong message to the Forest Service that we are not forgetting about the mine tailing site, that we're expecting them to move expeditiously in finding a solution

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to that site. And my question to you is how best can we document that?
BOARD MEMBER SCHNEIDER: Karl, in light of this suggested additional comment, number 11, that Mr. Coupe put together for us, I think that does the memorializing that I was thinking about, but I think a letter from the executive officer, or assistant executive officer, to the Forest Service clarifying the decisions of the Board would accomplish that goal.
CHAIRPERSON LONGLEY: Does counsel agree with that?
LEGAL COUNSEL COUPE: That's certainly a course of action that the Board could take.
CHAIRPERSON LONGLEY: Good, thank you.
LEGAL COUNSEL COUPE: I just want to follow up in response to some of the testimony that I believe I heard yesterday in that regard. It appears that the relationship between Forest Service staff, from what I heard, and Regional Board staff seems to be a fairly cooperative, well-working relationship. But what I heard is there may be something higher up the food chain that may be an impediment or an obstacle. And I am only speculating. Maybe it's the fact that they don't have -- maybe it's a funding issue, maybe it's a staffing issue. I don't know what those concerns are, but I think that

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given what was mentioned yesterday that the working relationship with staff appears to be good, I think a letter in this case from someone higher up the food chain, would be useful.
CHAIRPERSON LONGLEY: Thank you. Thank you very much for your advise.
With that said, I will open this back up for brief comments, of course, follow-up by the prosecution team. I'll entertain your comments now. And about how long do you believe your comments will take?
LEGAL COUNSEL COUPE: I'm sorry, Dr. Longley. Before we start, do you want to make a specific ruling on the exhibits, or do you want to wait on that until we get comment on the order itself?
CHAIRPERSON LONGLEY: I did not believe it was necessary to change my ruling on the exhibits. I had already excluded the exhibits from the record, and it was stated that in fact what appeared to happen did happen.
LEGAL COUNSEL COUPE: Thank you, just wanted to affirm that.
MS. WANG: And in answer to your question, Dr. Longley, I think my comments will take fewer than five minutes.
CHAIRPERSON LONGLEY: Appreciate it. Go ahead.
MS. WANG: First a point of clarification: I am

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concerned there is some ambiguity in this order regarding past costs. As you have heard yesterday, the prosecution team has withdrawn its request for seeking reimbursement for past costs. Paragraph 26 discusses these past costs but does not indicate that they are not seeking them here. And paragraphs 52 and 5, 5 on page 12, so it's 5 in the tasks section, I think creates an ambiguity about whether past costs are recoverable. So I'd simply request that that ambiguity be cleared up. Perhaps the easiest way to do that is to add a sentence at the end of paragraph 26 confirming that the Board does not seek past costs from Atlantic Richfield here.
So that's my first comment. We do have, just for the record, a number of objections to this corrective action order. And I understood from your comments before, Dr. Longley, that you would not like to hear those at this time but only hear comments about timing; is that correct?
CHAIRPERSON LONGLEY: I'll give you a couple more minutes to address issues that you may deem appropriate.
MS. WANG: And you've heard a lot of this yesterday, so I'll be really brief and this is really just for the record. There are a number of statements in this order that we do not believe there was any factual evidence for. I know the Board doesn't have time today for me to go into detail on that, but I will just refer

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you to Appendix 6 to Atlantic Richfield's February 20th submissions which contains detailed comments on a previous iteration of this order and most of those comments are still applicable.
I will take the time to point out just two things about this order. One is that we believe it's defective in that it doesn't acknowledge the Board's own liability. It doesn't address it or absolve the Board of it's own liabilities for the current remedy. And then lastly I'll just say that we believe paragraph 11 is incorrect. This order if issued would still be a challenge to the CERCLA cleanup action because of the interconnection between the sites. So thank you for humoring me on that.
I'll turn to the timing issues. As you know, and it's and been discussed yesterday, Atlantic Richfield does have an opportunity for additional review of this order. We have an opportunity to appeal it to the State Board. We're also considering, given the interplay between this and the federal consent decree, seeking some advise from the federal judge on this who entered that decree.
For that review process to have meaning, we would like some of these deadlines extended. The first deadline as currently written falls on May 30th. Given the tough caseload of all these tribunals, we really think it's very possible that the State Water Board or the federal court

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really won't be able to address a motion to stay.
CHAIRPERSON LONGLEY: Excuse me, take me in this order too.
MS. WANG: So the first deadline appears on page 11 under the tasks heading. So the very first deadline is May 30th, and so what we respectfully request is that this Board extend all deadlines in here by 90 days and we think that will be enough time to get on the docket for the State Board or the federal court, if the case may be, to request a stay. And we think this is a very complex case that raises a number of important questions that we'd like reviewed. There's the application of U.S. Supreme Court precedent. There's serious questions of constitutional law, and as I alluded to before, there are implications for Atlantic Richfield's compliance with the federal consent decree. We no want to put our client in a situation where complying with this order puts it in violation of a federal order. We'd like to have a chance to get some guidance from the judge who signed the federal order on those issues. And for that reason, I respectfully request that you extend all deadlines by 90 days.
CHAIRPERSON LONGLEY: Thank you. Prosecution team?
MR. TAURIAINEN: Thank you, Dr. Longley. Andrew

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Taurlainen of the Office of Enforcement for the prosecution for team. We just have a few comments, just a couple minutes worth, and I'll take them in order as they appear.
In paragraph 4, the new language tying, aligning the finding with the Bestfoods decision, I think it's appropriate to do that. I think it's also appropriate to add to that sentence, perhaps after the word waste in the first sentence of paragraph 4 the phrase "specifically the discharge of mining waste," which ties, also, the finding to the Water Code.
The same change would be requested for the first sentence of paragraph 36. And then one more comment regarding the findings in paragraph 36: There was evidence presented yesterday, and I believe a Board discussion regarding evidence that International Smelting and Refining Company was active on the site beginning in 1916 through 1918. I would recommend that we add a sentence at the end of paragraph 36 noting that International managed, directed, or conducted operations specifically related to leakage or disposal of waste, specifically the discharge of mining waste, from approximately 1916 through 1918.
And then the last comment -- it's not a suggestion. It's just a comment to note that the language

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deleted from paragraph 10 of the order, which is on page 13 regarding the responsibilities continuing until the mine no longer poses a threat. I would just note for the record that language comes from Title 27 Section 22510. But I'd also note that paragraph two of the order specifically requires compliance with Title 27, including Section 22510. So we're okay with the deletion, just with the recognition that the Title 27 requirements are already incorporated. And then as far as the --
LEGAL COUNSEL COUPE: So Mr. Tauriainen, you aren't specifically recognizing -- suggesting an alternative change?
MR. TAURIAINEN: That's correct, just noting for the record.
LEGAL COUNSEL COUPE: Thank you.
MR. TAURIAINEN: The comment from ARCO regarding past costs, I think with the removal that the prosecution team did of specific reference to past costs, I think the order speaks for itself and it clearly does not seek past costs.
In regarding timing, the prosecution team would oppose any request by ARCO for an extension of any of the deadlines. There is a process to request a stay on a petition to the State Board, and we would suggest that ARCO can avail itself of that process and there's no need

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for any extension or abeyance here. Thank you.
CHAIRPERSON LONGLEY: Thank you.
LEGAL COUNSEL COUPE: And Dr. Longley, let me just add, we weren't really thinking of it, quite frankly, in terms of whether the Board may be inclined to alter the dates based on what administrative or judicial challenges someone may want to pursue. It was more a function of it's the end of March and our first deadline is in May. That seems -- I am not a scientist. I am not an engineer. That just seems like a pretty quick period of time.
BOARD MEMBER RAMIREZ: Well, but you are a lawyer. Do you think that that's enough time for somebody to seek a stay? And I just want advice to us.
LEGAL COUNSEL COUPE: Certainly the regulations, as Mr. Tauriainen pointed out, provide an opportunity for an aggrieved party to seek a stay from the State Water Board. The practical reality is, given the State Board's workload, I don't know. I couldn't tell you one way or the other whether they would be willing, how expeditiously they would be able to act in actually queuing up a request for a stay at a State Board hearing.
BOARD MEMBER RAMIREZ: Mr. Coupe, your time is up.
CHAIRPERSON LONGLEY: No, it isn't (laughter). Good. So, you know, I am hoping the comments

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form the Board on the requests that have been made to us, the first being from Ms. Wang on the 90 days, and then a number of comments by the prosecution pertaining specifically to paragraphs 4 and 36 adding mining before the waste. I personally don't see a problem with that. Do you see any issues with that, Counsel?

LEGAL COUNSEL COUPE: I don't see any issues with the suggested language change that adds specifically the discharge of mining waste as referenced in a couple of findings as pointed out by the prosecution team. And, certainly, the Board is inclined in its judgment, if it wants to add an additional finding as it pertains to saying that the Board isn't seeking past costs, but again, I don't think it's absolutely necessary.

BOARD MEMBER RAMIREZ: Dr. Longley, I don't know that it's absolutely necessarily, but I do think it's important for clarification because if we mention costs, after we're long gone someone could imply that the fact that we're mentioning costs, that there was.

CHAIRPERSON LONGLEY: I appreciate your comments. You want to tighten the record.

Could you propose some language for us for a finding such as that?

LEGAL COUNSEL COUPE: First of all, I'd like to ask Atlantic Richfield if they have a suggestion in that

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regard.

MS. WANG: We do. Let's see if I can find that page again.

My suggestion is on page 5 on paragraph 26, which currently reads "Since 1984, the Central Valley Water Board has spent more than 2.6 million on the Walker Mine acid mine drainage abatement project." Simply adding a second sentence, which is that the Regional Board does not seek reimbursement for these pasts costs or for any past costs against Atlantic Richfield -- let me just consult with my partner.

So let me start again: That we add a second sentence saying that the Regional Board does not seek reimbursement for any past costs through the effective date of the order against Atlantic Richfield.

LEGAL COUNSEL COUPE: Do I have any comment from the prosecution team in that regard?

MR. TAURIAINEN: I would just add to the end of that sentence the phrase through this order.

CHAIRPERSON LONGLEY: Is there an objection?

LEGAL COUNSEL COUPE: I don't think I have all the language. I am trying to piece together a couple different pieces. So maybe someone can write it out and read it into the record just so we're absolutely clear about what that finding is going to say.

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CHAIRPERSON LONGLEY: Good. Looks like we're going to be acting on this document, so you've got a short while to do it. When we get to the point of adopting the document, we will be going through each of the changes again. And if we could have that in writing, I agree counsel, that would be a great benefit to us.

BOARD MEMBER RAMIREZ: And Dr. Longley, as to the 90 days, I think it's clear that no one is -- Atlantic Richfield is not pretending that they are going to start work on this. Really the purpose of these dates, which we would hope would be to start cleanup, that's not going to happen. So if the purpose is to seek a stay, I don't know that there's going to be any prejudice in extending the deadline for 90 days. I know it's additional work for staff.

CHAIRPERSON LONGLEY: Well, it's changing a number. And I do agree, we probably need to change, even if the stay requests were not before us. 30 May is awful close, and we probably need to change that date anyway. Is it 30 days, 60 days, 90 days, or some other amount, I think is really the question.

BOARD MEMBER RAMIREZ: Well, I don't know, but I do recall there being testimony in other hearings about sometimes it takes a while to get an answer from either State Board or even getting on the federal docket. So I

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don't know. I think 90 days is -- I don't have a preference, but I think somewhere between 30 and 90 extension is good for me.

CHAIRPERSON LONGLEY: Bob, do you?

BOARD MEMBER SCHNEIDER: I wouldn't just add 90 days to the existing dates, but I might make it 90 days from today. What does that add, two months.

CHAIRPERSON LONGLEY: Well, we could go -- I think it's about the same thing as you're suggesting. We could go to 30 June then.

BOARD MEMBER SCHNEIDER: So it's -- I don't know if 30 June makes it a total of 90 days until we begin implementation of this order.

CHAIRPERSON LONGLEY: We need to check the calendar. Would that satisfy you?

BOARD MEMBER RAMIREZ: Yeah, I think an additional 60 days to the May 30th deadline would be fine.

CHAIRPERSON LONGLEY: Well, we're talking 30 July then, 31 July.

VICE-CHAIR MOFFITT: Are we talking about just the first deadline or all the deadlines?

CHAIRPERSON LONGLEY: I would suggest we hold that just to the first deadline. Some of other deadlines are quite a ways off.

BOARD MEMBER SCHNEIDER: That's what I said. I

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was talking 90 days from now, which would be the end of June.
LEGAL COUNSEL COUPE: Well, we do have some deadlines in June and December of this year.
BOARD MEMBER SCHNEIDER: We have to extend everything. I think that make senses, but I think if we take it 90 days from now that's more than enough.
LEGAL COUNSEL COUPE: So if I'm hearing Mr. Schneider's suggestion correctly, he's suggesting that we push out all the task deadlines that are listed, so the 30 May 2014 deadline, the 27 June 2014 deadline, the 31 December 2014 deadline, the 30 April 2015 deadline, the 30 June 2015, and finally the 31 December 2017 deadline; is that correct?
BOARD MEMBER SCHNEIDER: And I guess that's a 30-day extension and not a 90-day extension.
LEGAL COUNSEL COUPE: By 30 days, thank you.
BOARD MEMBER SCHNEIDER: Does that make sense?
CHAIRPERSON LONGLEY: Good. Let's close the hearing again. I'll accept the motion at this point.
LEGAL COUNSEL COUPE: Let's make sure that we have got the language buttoned up as to Finding 26 if that's the pleasure of the Board.
CHAIRPERSON LONGLEY: I'd ask for written language.

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LEGAL COUNSEL COUPE: I have a suggestion off the cuff in trying to understand each of the parties respective requests, and I am probably not going to make either one of them but I'll take a stab at it and say that the Board does not seek any reimbursement for past costs through this order. So it keeps the any, but it specifically limits it to the order itself. I don't think that's going to make either party a hundred percent happy, but it certainly gives Atlantic Richfield a little breadth in that regard and it certainly cabins it in for purposes of this order.
CHAIRPERSON LONGLEY: I like the language. I think we have agreement up here.
BOARD MEMBER SCHNEIDER: I'll make the motion that we adopt this.
CHAIRPERSON LONGLEY: With the 30 June date.
BOARD MEMBER SCHNEIDER: Yeah, with the late, late revisions and our attorney's recommendations, I'll make that motion.
CHAIRPERSON LONGLEY: With 30 June, the other dates adjusted in accordance as counsel was suggesting and with this last language that we just got.
LEGAL COUNSEL MAYER: There was some additional language suggested by the prosecution team for Finding 36 regarding the time frame approximately starting 1916

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through 1918. And David is saying that he's okay with that. You can walk through it.
LEGAL COUNSEL COUPE: My recall is -- I want to be clear what the language was that was specifically suggested as read into the record in that regard.
CHAIRPERSON LONGLEY: I'm not too happy with that language, unless a Board member wants to insert the language.
BOARD MEMBER RAMIREZ: The 1916 date?
CHAIRPERSON LONGLEY: Yes.
LEGAL COUNSEL COUPE: This has to do with, I believe it's International's involvement in managing or directing activities at the mine from approximately 1916 to 1918.
BOARD MEMBER SCHNEIDER: I think that's relevant.
BOARD MEMBER RAMIREZ: That was something that specifically spoke to me yesterday when we heard testimony.
CHAIRPERSON LONGLEY: Okay. What would that language be?
LEGAL COUNSEL MAYER: It would be the last sentence of this revised section 36. And one other thought to keep in mind is that when the advisory team made our revisions, we did add the qualifier approximately prior to all references to 1918. So we were trying to

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account for the fact that this pre-1918 period of time, there could have been control of certain pollution control activities. I think the finding that is suggest by the prosecution team does provide more clarity to that issue. So if the Board is inclined to add more clarity, then I'd recommend doing so.
CHAIRPERSON LONGLEY: Do the Board members understand that additional language?
BOARD MEMBER RAMIREZ: Yeah, and I think having the year more is more accurate than saying approximately, so I would support an insertion of the year 1916.
LEGAL COUNSEL MAYER: If the prosecution team could read that language one more time.
MR. TAURIAINEN: Sure. And specifically it would be an additional sentence. On top of the proposed changes and then our suggested change regarding discharge of mining waste in the first sentence, the last sentence, the new last sentence of the paragraph would read "International managed, directed, or conducted operations specifically related to the leakage or disposal of mining waste from approximately 1916 through 1918."
CHAIRPERSON LONGLEY: Yes, Jenny, go ahead.
VICE-CHAIR MOFFITT: I'm just wondering why we would add that sentence down there and not just the change the date from 1918 to 1916 up above. Is there a

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difference between International and Walker in the reference up above?
CHAIRPERSON LONGLEY: Why don't we address the question to David.
LEGAL COUNSEL COUPE: I'm not sure about the need for the additional section. It's an important question that Ms. Moffitt raises, and I don't have an answer for you right now.
LEGAL COUNSEL MAYER: I could take a stab at that. Perhaps the reason is that the prior -- that paragraph, 36, the first sentence talks about concurrent management between Anaconda, International, and Walker whereas the contract that was noted yesterday is strictly between International and Walker. So perhaps there's a reason to -- it's more accurate to include the last sentence just focusing on International and Walker during the time frame 1916 to 1918. And that is prior to the corporate ownership taking place that linked International to Anaconda.
BOARD MEMBER SCHNEIDER: I have one other suggestion since it seems important to me. There's another information item that's a half hour. I would suggest we get a clean copy back for our vote. So if we can just extend this until after that.
CHAIRPERSON LONGLEY: You have made the motion.

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Do I have a second on the motion?
LEGAL COUNSEL COUPE: You want a clean copy so that you're not going to be able see the changes we talked about.
BOARD MEMBER SCHNEIDER: I think I want a clean copy.
CHAIRPERSON LONGLEY: You want to clean copy or a corrected copy?
BOARD MEMBER SCHNEIDER: Let's do a corrected copy with all these very last minute changes.
LEGAL COUNSEL COUPE: So that you can see all the red line changes.
BOARD MEMBER SCHNEIDER: Yeah, I want to know exactly what we're voting on.
CHAIRPERSON LONGLEY: And we have a motion, but I never got a second.
VICE-CHAIR MOFFITT: I'll second.
CHAIRPERSON LONGLEY: And Jenny has seconded. With that we are ready to vote once we have a little more discussion with the corrected copy.
BOARD MEMBER SCHNEIDER: I don't know that it will take any more discussion, but I'd like to see that corrected copy.
CHAIRPERSON LONGLEY: I have to leave Board members the opportunity to talk. So with that said, we'll

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continue this until we get a little farther down the road.
(Whereupon the Board moved on to the next topic and resumed discussion of Item 15 at 10:16 a.m.)
CHAIRPERSON LONGLEY: Mr. Coupe, are we ready to go back?
LEGAL COUNSEL COUPE: I think we're ready to go back to Item 15.
CHAIRPERSON LONGLEY: So we're back on Item 15 and we're receiving an updated copy of the proposed order.
LEGAL COUNSEL COUPE: So the advisory team has made changes consistent with what we believe was direction we received from the Board, and you have color copies as Ken was nice enough to print out and you see those changes. Everything, I thinks from our prospective, is represented here faithfully except for we may have missed one of the dates on page 12, paragraph, or Task seven. Where it says 1 June 2015, I think that needs to say 1 July 2015, and Alex already checked his calendar and I don't think that falls on a weekend. So if you want to take a minute or so and look at the changes, and if you have any questions let us know.
BOARD MEMBER SCHNEIDER: I be happy to move this cleanup and abatement order with that one correction on the date.
VICE-CHAIR MOFFITT: I'll second.

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LEGAL COUNSEL COUPE: Dr. Longley, just before the Board votes, what I did hear as part of the motion was a direction provided for a letter to be written to the Forest Service -- I think at the assistant executive officer level, to the Forest Service just underscoring the Board's earnestness and seriousness in directing this approach and looking forward to continued collaboration in cleaning up the mine tailing site.
CHAIRPERSON LONGLEY: You are correct. That's intent of this Board, and that's part of the record. Any discussion on the motion? If not then we'll proceed with voting. This is a voice vote. All in favor of the order state so by saying aye.
(Ayes.)
CHAIRPERSON LONGLEY: Opposed say no.
Abstentions?
Motion carries. Thank you very much. I extend my thanks to all parties involved. Although we may not agree on issues, it was a very professional presentation. Thank you.
(Whereupon Item 15 concluded at 10:19 a.m.)

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CERTIFICATE OF SHORTHAND REPORTER

I, Allen Rose, CSR 13753, hereby certify that I am a Certified Shorthand Reporter; that I recorded verbatim in shorthand writing the foregoing proceedings completely and correctly; that I have caused under my direction said shorthand writing to be transcribed into typewriting and the foregoing pages constitute a complete and accurate transcript of said shorthand writing taken at the above-mentioned proceedings.

I further certify that I am not of counsel or attorney for any of the parties to said proceeding nor in any way interested in the outcome of said proceeding.

Dated: April 3, 2014

_____

Allen Rose, CSR 13753

Exhibit 35

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2014-XXXX

ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE

WALKER MINE TAILINGS
PLUMAS COUNTY

CLEANUP AND ABATEMENT ORDER NO. R5-2014-YYYY

ATLANTIC RICHFIELD COMPANY

WALKER MINE
PLUMAS COUNTY

PROSECUTION TEAM'S OPENING BRIEF AND RESPONSE TO DISCHARGERS' 3 JUNE 2013 COMMENTS ON DRAFT CLEANUP AND ABATEMENT ORDERS

TABLE OF CONTENTS

I. Introduction

Before the Central Valley Water Board are two proposed cleanup and abatement orders (CAOs) regarding the Walker Mine (R5-2013-YYYY) and the Walker Mine Tailings (R5-2013-XXXX), an abandoned underground copper mine complex in Plumas County. The site requires two CAOs because the Mine is privately-owned while the Tailings are on United States Forest Service land. Atlantic Richfield Company (Atlantic Richfield or ARCO) is named to both CAOs as successor to the former mine operators. The Forest Service is named to the Tailings CAO as owner and as discharger under the current waste discharge requirements for the Tailings. Atlantic Richfield and the Forest Service are collectively referred to as "Dischargers." This brief supports the Prosecution Team's case-in-chief for the 27/28 March 2014 hearing and, where indicated, provides responses to the Dischargers' 3 June 2013 comments on the draft CAOs.

II. Applicable Legal Standards

The Regional Board or the Executive Officer may issue a cleanup an abatement order to any person who discharges waste into waters of the state in violation of any waste discharge requirement or other order or prohibition issued by a regional board or the state board, or who discharges or threatens to discharge waste where it is, or probably will be, discharged into waters of the state and creates, or threatens to create, pollution[1] or nuisance[2]. (Water Code § 13304, subd. (a).)

The Regional Board or the Executive Officer may require that any person who has discharged, discharges, or is suspected of having discharged or discharging waste, or who proposes to discharge waste within its region, shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires. The burden, including costs, shall bear a reasonable relationship to the need for the report and the benefits to be obtained. (Water Code § 13267, subd. (b)(1).)

Board actions must be supported by substantial evidence. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506.) A party asserting something in the affirmative has the burden of proving the affirmative matter with substantial evidence. (See, e.g., Evidence Code § 115; *Topanga Assn.*, at 521 [party seeking variance has burden of proving entitlement to variance].) Substantial evidence

[1] "Pollution" "means an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either ... waters for beneficial uses or ... facilities which serve these beneficial uses." (Water Code § 13050, subd. (*l*).)

[2] "Nuisance" "means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes." (Water Code § 13050, subd. (n).)

"means credible and reasonable evidence." (*In re: Sanmina Corp*, State Water Resources Control Board Order No. WQ 93-14.)

All liability under Water Code section 13304 is joint and several, but the Board need not address the liability of other dischargers at the same hearing. (*In the Matter of the Petition of Union Oil Company of California*, State Water Resources Control Board Order No. WQ 90-2, at 8.)

III. Issues Framed by the Mine CAO (R5-2013-YYYY)

Acid mine drainage and other pollutants (notably copper) from the Mine site discharge or threaten to discharge to Dolly Creek and other waters of the state and of the United States within the Little Grizzly Creek watershed, violating the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan), impairing beneficial uses and creating or threatening to create a condition of pollution or nuisance. The Mine CAO describes the extensive history of the site, as well as recent discharges, threatened discharges and violations. The Prosecution Team submits recent Central Valley Water Board staff inspection reports and water quality laboratory analyses showing recent discharges in violation of the applicable water quality objectives. (Prosecution Team Exhibits 23 through 46[3].) Jeffrey Huggins, Water Resources Control Engineer for the Central Valley Regional Water Board, authenticates the Exhibits and will testify as to the current conditions and discharge violations at the site.

The mine operated from approximately 1915 until 1941, when the dewatering pumps were removed and the site was abandoned. The site likely began discharging waste immediately through surface runoff over the abandoned mining waste. The mine likely began discharging polluted groundwater to surface waters shortly thereafter, when groundwater flooding the underground mine workings reached the unsealed 700 level mine portal and flowed into Dolly Creek and then Little Grizzly Creek. By 1947, the Department of Fish and Game documented that waste discharges of toxics and silt from the mine and tailings had destroyed all fishing and recreation uses on Little Grizzly Creek for a distance of about 10 miles, to the confluence of Indian Creek. (Central Valley Water Board Resolutions 58-180 and 58-181 and Trumbull Report dated October 5, 1957 [Prosecution Team Exhibits 18, 19 and 20].) These discharges continued unabated while the Central Valley Water Board attempted to work with the site owners.

By 1986, the Central Valley Water Board decided to seal the 700 level mine portal under authority of Water Code section 13305. (Central Valley Water Board Resolution 86-057 [Prosecution Team Exhibit 13].) This stopped the discharge of acid mine drainage and copper from the underground workings into Dolly Creek and downstream, and allowed aquatic life to return to Little Grizzly Creek. (See USFS Biological Monitoring Report, dated 2006 [an electronic copy of this report is included in the

[3] All Exhibits are attached to the Prosecution Team's Evidence List. Except as otherwise noted, all Exhibits are authenticated through the Declaration and testimony of Jeffrey Huggins.

Prosecution Team's Case-in-Chief submittal CD, in the folder "USFS Tailings Monitoring Reports"].) However, the surface of the mine site contains mining waste, which is the source of ongoing unlawful discharges of copper and other waste into Dolly Creek and downstream. Moreover, the mine seal impounds significant amounts of highly acidic, copper-laden groundwater, which remains a threat to surface waters requiring ongoing monitoring and maintenance. Finally, the mine site contains adits and other mine-related surface disturbances which pose safety hazards and potential sources of discharge.

Since 1986, the Central Valley Regional Water Board has borne the costs associated with securing and monitoring the seal and monitoring water quality throughout the site. The Board has also taken action to rehabilitate the portal tunnel, and to install drainage channels to reduce the amount of surface runoff into adits and other mine openings above the portal, each at significant cost.

The purpose of the Mine CAO is to compel Atlantic Richfield (ARCO) to assume responsibility for operation and maintenance of the mine seal, as well as to take necessary action to clean up and abate active and threatened discharges from the rest of the site. Atlantic Richfield is the sole remaining viable responsibility party. The liability of the current and former owners and other potentially responsible parties has been resolved through prior Board action and litigation. (See Prosecution Team Exhibits 16 and 17 [Judgments regarding prior lawsuits].)

Atlantic Richfield is liable because its predecessors, Anaconda Copper Company (Anaconda) and International Smelting and Refining Company (International), operated the Walker Mine and Tailings concurrently with their subsidiary, Walker Mining Company, thus triggering "operator" liability (also called "direct" liability) under *United States v. Bestfoods* (1998) 524 U.S. 51. Atlantic Richfield concedes its status as successor to Anaconda and International, but challenges whether Anaconda or International operated the mine and tailings.

The Prosecution Team submits documents obtained from the Anaconda Copper Company's Geological records archived at the University of Wyoming and other historical documents that show how Anaconda directed specific pollution-causing activities at the mine sufficient to trigger operator liability. (Prosecution Team Exhibit 1 [index and documents].[4]) The Prosecution Team also submits the expert declaration (Prosecution Team Exhibit 2) and testimony of Dr. Fredric Quivik, an historian specializing in early industrial practices with significant expertize regarding Anaconda's mining activities. Dr. Quivik has extensive experience testifying in litigation against

[4] Prosecution Team Exhibit 1 contains indexed records from the American Heritage Center's Anaconda Geological Documents Collection archive and the Montana Historical Society. The Anaconda Geological Collection documents are authenticated through the letter from Rachael Dreyer (Prosecution Team Exhibit 4) as well as the Declaration and testimony of Jeffrey Huggins. The Montana Historical Society documents are authenticated through the Declaration and testimony of Jeffrey Huggins (Prosecution Team Exhibit 2).

Atlantic Richfield and others in similar matters involving the same or similar legal theories. Dr. Quivik's *curriculum vitae* is attached to his declaration, and together with his declaration demonstrates sufficient specialized knowledge and expertise on the subject of Anaconda's operations to be qualified as an expert here. Dr. Quivik has reviewed the Prosecution Team's evidence and concludes that Anaconda and International concurrently operated the Walker Mine from about 1918 until 1941. (Quivik Declaration, Prosecution Team Exhibit 2, at 8.) The Prosecution Team's direct liability legal theory, supporting evidence and Dr. Quivik's findings are discussed in Section VII.d below.

IV. Issues Framed by the Tailings CAO (R5-2013-XXXX)

Copper and other mine waste from the Tailings site discharge and threaten to discharge to Dolly Creek and Little Grizzly Creek, in violation of the Forest Service's waste discharge requirements (WDRs) Order No. 5-00-028 (Prosecution Team Exhibit 9), and in violation of the Basin Plan. The Tailings CAO describes the site history, discharges, threatened discharges and violations. In support, the Prosecution Team offers the same inspection reports, laboratory analyses and other evidence and testimony submitted to demonstrate discharge violations from the Mine, described in the previous section.

The Forest Service has been subject to Central Valley Water Board WDRs at the Tailings for decades, but the Forest Service now argues that the Board cannot regulate it due to the ongoing (and decades old) CERCLA action at the Tailings. The Forest Service mischaracterizes the Tailings CAO and CERCLA. The Tailings CAO is based in the Regional Board's California Water Code and federally-delegated Clean Water Act authority. CERCLA allows state agencies to enforce federally-delegated state authority against federal agencies operating CERCLA sites. The Prosecution Team addresses the Forest Service's arguments in Section VI.b below.

Atlantic Richfield is liable at the Tailings through its predecessors Anaconda and International under the same legal theory and evidence as for the Mine CAO, as discussed in the previous section and in Section VII.d below.

V. Dischargers' Comments on Draft CAOs

On 29 April 2013, the Prosecution Team served copies of the draft Tailings CAO to the Forest Service and Atlantic Richfield, and a copy of the draft Mine CAO to Atlantic Richfield. The Dischargers received all attachments referenced in the drafts. The draft CAOs, without attachments, are Prosecution Team Exhibit 5 (draft Tailings CAO) and Exhibit 6 (draft Mine CAO).

The Dischargers each provided written comments on the draft CAOs on 3 June 2013. Dischargers' comments are Prosecution Team Exhibit 7 (Forest Service Comments) and Exhibit 8 (Atlantic Richfield Comments). The following sections respond to those comments and describe the resulting changes in the CAOs.

VI. Responses to Forest Service Comments

a. The Forest Service cannot challenge Order R5-00-028 through the Tailings CAO

The Forest Service's comments address only the Tailings CAO. The Forest Service first describes Central Valley Water Board Order R5-00-028 as a "challenge [to] the Forest Service's actions in addressing the heavy metals contamination on Federally managed land." (Forest Service Comments, at 1.) The Forest Service refers to its ongoing CERCLA (42 USC § 9601 *et seq.*) action at the Tailings, which commenced in 1994.

Central Valley Water Board Order R5-00-028, dated 28 January 2000, sets waste discharge requirements for the Tailings and names the Forest Service as discharger. Order R5-00-028 directs the Forest Service to achieve "full compliance with Receiving Water Limitations" by 1 October 2008. (Order R5-00-028 [Prosecution Team Exhibit 9], at 8.) As the Tailings CAO explains, the Forest Service did not meet that deadline and discharges from the Tailings continue to violate Basin Plan Receiving Water Limitations.

The Forest Service was aware of Order R5-00-028 when it was adopted. The Forest Service was named discharger for WDRs pertaining to the Tailings in 1986 (Order R5-86-073) and again in 1991 (Order R5-01-017). The Forest Service submitted comments on the tentative order that became Order R5-00-028. (Forest Service's 18 December 1999 Comments Regarding Tentative Order Revising Waste Discharge Requirements Walker Mine Tailings [Prosecution Team Exhibit 10]). The Forest Service's 1999 comments make no CERCLA-based objections, and instead state that provisions of the order "will become a part of the amended [CERCLA] Record of Decision (ROD) for treatment of the site." (*Id.* at 1.) The Forest Service ultimately incorporated the substantive provisions of Order R5-00-028 into the 2001 ROD Amendment. (Forest Service Comments, at 2.)

To the extent that the Forest Service now argues that Order R5-00-028 is a challenge to the ongoing CERCLA action, such arguments are barred under the doctrine of collateral estoppel, which precludes a party to an action from relitigating in a second proceeding matters that were litigated and determined in a prior proceeding. (*Lucido v. Superior Court* (1998) 51 Cal.3d 335, 341.) The Forest Service could have challenged Order R5-00-028 upon issuance, but it did not and the time for doing so has passed. (Water Code § 13320, subd. (a).) The Forest Service cannot challenge Order R5-00-028 here.

b. CERCLA does not bar the Tailings CAO

The Forest Service argues that the Tailings CAO is a "challenge[] to Forest Service's cleanup action" barred by CERCLA section 113(h), 42 USC § 9613(h). (Forest Service Comments, at 1.) This mischaracterizes both the Tailings CAO and CERCLA.

i. The Tailings CAO is based on Water Code authority

Water Code section 13304 authorizes the Central Valley Water Board to compel the Forest Service and Atlantic Richfield to clean up and abate the effects of the waste at the Tailings to prevent the discharge of waste into waters of the state and of the United States. This authority arises in part from the Clean Water Act (See 33 USC § 1311, subd. (a) [prohibiting unauthorized discharge of pollutants]), which the United States Environmental Protection Agency (EPA) delegated to the State of California. The Forest Service is subject to the Central Valley Water Board's Clean Water Act authority over discharges from the Tailings. (33 USC § 1323, subd. (a).) If the Forest Service fails to comply with the Tailings CAO, the Attorney General for the State of California may seek injunctive relief from the superior court. (Water Code § 13304, subd. (a).)

ii. CERCLA does not preempt the Water Code

CERCLA does not preempt the Central Valley Water Board's Water Code authority over discharges from the Tailings. CERCLA reserves such authority to the State:

> Nothing in this chapter shall be construed or interpreted as preempting any State from imposing any additional liability or requirements with respect to the release of hazardous substances within such State.

(CERCLA Section 114(a), 42 USC § 9614, subd. (a).)

CERCLA reserves authority to all federal and State laws regarding discharges of pollutants:

> Nothing in this chapter shall affect or modify in any way the obligations or liabilities of any person under other Federal or State law, including common law, with respect to releases of hazardous substances or other pollutants or contaminants....

(CERCLA Section 302(d), 42 USC § 9652, subd. (d).)

Moreover, CERCLA specifically allows states to enforce state cleanup laws against federal agencies at federal sites:

> State laws concerning removal and remedial action, *including State laws regarding enforcement*, shall apply to removal and remedial action at facilities owned or operated by a department, agency, or instrumentality of the United States....

(CERCLA Section 120(a)(4), 42 USC § 9620, subd. (a)(4) [emphasis added].)

Where State standards have been incorporated into a CERCLA cleanup action, the State may – but is not required to – enforce those standards in federal court:

> A State *may* enforce any Federal or State standard, requirement, criteria, or limitation to which the remedial action is required to conform under this chapter in the United States district court for the district in which the facility is located....

(CERCLA Section 121(e)(4), 42 USC § 9621, subd. (e)(4) [emphasis added].)

iii. CERCLA § 113(h) does not limit California's Clean Water Act enforcement authority over federally managed CERCLA sites

CERCLA Section 113(h) provides, in relevant part, that:

> No Federal court shall have jurisdiction under Federal law other than under section 1332 of Title 28 (relating to diversity of citizenship jurisdiction) or under State law which is applicable or relevant and appropriate under section 9621 of this title (relating to cleanup standards) to review any challenges to removal or remedial action selected under section 9604 of this title, or to review any order issued under section 9606(a) of this title, in any action except [CERCLA-based actions]....

(42 USC § 9613, subd. (h).)

The Forest Service issued the CERCLA Record of Decision (ROD) for the Tailings in 1994, and amended the ROD in 2001. To date, the Forest Service has implemented all or essentially all of the remedial actions described in the ROD, but the remedial action remains open. Discharges from the Tailings continue to violate WDR Order R5-00-028 and applicable Basin Plan Receiving Water Limitations, which have been incorporated into the ROD as "applicable or relevant and appropriate" standards pursuant to 42 USC section 9621.

The Central Valley Water Board does not concede that the ROD qualifies as a "removal or remedial action selected under section 9604" or as an "order issued under section 9606(a)" as those terms are used in Section 113(h), because the ROD appears to be a remedial action pursuant to Section 120, 42 USC § 9620. (See *Fort Ord Toxics Project, Inc. v. California EPA* (9th Cir. 1999) 189 F.3d 838, 833-34 [Section 120 remedial actions fall outside Section 104 and thus are not subject to Section 113(h)].) However, even assuming for argument that the ROD does so qualify, the Tailings CAO is not a "challenge" to it, and the Central Valley Water Board is free to utilize the administrative and judicial enforcement processes authorized under the Water Code.

The Forest Service ignores the plain meaning of the relevant CERCLA sections and the only case interpreting them under nearly identical facts. In *United States v. Colorado*

(10th Cir. 1993) 990 F.2d 1565,[5] the Army challenged the State of Colorado's action to enforce provisions of the Resource Conservation and Recovery Act (RCRA), 42 USC § 6901 et seq., which had been delegated to Colorado by the EPA. The Army argued that because its facility was the subject of an ongoing CERCLA remediation action, Section 113(h) barred Colorado from issuing an administrative compliance order regarding the facility under state law. Citing CERCLA sections 114 (a) and 302(d), the court rejected the Army and held that "an action by Colorado to enforce the ... compliance order, issued pursuant to its EPA-delegated RCRA authority, is not a 'challenge' to the Army's CERCLA response action." (990 F.2d at 1575.) Moreover, the court held that Section 113(h) is not a bar because "Colorado can seek enforcement of the ... compliance order in state court" rather than in federal court. (*Id.* at 1579.)

Most of the cases cited by the Forest Service Comments are distinguishable in that they involve CERCLA lawsuits by private citizens or local agencies brought in federal court. (See *Pakootas v. Teck Cominco Metals, Ltd.* (9th Cir. 2011) 646 F.3d 1214 [citizen suit brought in federal district court]; *Clinton v Cnty. Comm'rs v. EPA* (3rd Cir. 1997) 116 F.3d 1018 [local government commissioners and private group brought citizen suit in federal district court]; *City of Fresno v. United States* (E.D. Cal. 2010) 709 F.Supp.2d 888 [city filed citizen suit in federal court]; *City of Salina, Kan. v. United States* (D.Kan. Mar. 25, 2011) 10-2298-CM-DJW, 2011 WL 1107107 [same].) The last case, *United States v. City & County of Denver* (10th Cir. 1996) 100 F.3d 1509, is distinguishable in that it involves a federal agency challenge to a city's cease and desist order issued under local ordinances. None of the cases address CERCLA's reservations of authority, and none involve federal challenge to state administrative action under federally-delegated state authority.

Other Ninth Circuit cases similarly fail to support the Forest Service. *McClellan Ecological Seepage Situation (MESS) v. Perry* (9th Cir. 1995) 47 F.3d 325, holds only that a citizens group could not bring Clean Water Act and other state claims in federal court for sites covered under a Department of Defense CERCLA action, as such claims amounted to a challenge barred under Section 113(h). *MESS* does not address the question presented here, namely, whether a state agency can issue an enforcement order under federally-delegated law to a federal agency operating a CERCLA site on federal land.

In *Shea Homes Limited Partnership v. United States* (N.D. Cal. 2005) 397 F.Supp.2d 1194, the Northern District Court rejected a citizen group's attempt to rely in *United States v. Colorado*, noting that "*Colorado* is clearly distinguishable in that the Court premised its ruling on the fact that the party asserting the RCRA claim was a state, rather than a private party." (397 F.Supp at 1204.) Indeed, the federally-managed CERCLA site at issue in *Shea Homes* had already been the subject of San Francisco Bay Regional Water Board waste discharge requirements and a cleanup and abatement order, apparently without challenge by the federal agency. (397 F.Supp. at 1197.) (See

[5] Prosecution Team Exhibit 11 is a courtesy copy of the *United States v. Colorado* decision.

Prosecution Team Exhibit 47 [San Francisco Regional Water Board Orders R2-1996-0113 and R2-2001-0113].)

The Central Valley Water Board's position here is the same as Colorado's in *U.S. v. Colorado* – a state agency acting pursuant to state law to enforce a federal statute, under authority delegated to it by the EPA, against a federal agency operating a CERCLA site. Such actions are not "challenges" to ongoing CERCLA actions. And, like Colorado, the Central Valley Water Board is acting pursuant to state administrative procedures reviewable in state court without any need to seek redress in federal court. Section 113(h) does not bar the Tailings CAO.

VII. Responses to Atlantic Richfield Comments

a. The Consent Decree between the Forest Service and Atlantic Richfield does not alter Atlantic Richfield's status as discharger for the Tailings CAO

Atlantic Richfield argues that it cannot be a discharger in the Tailings CAO because the Consent Decree[6] involving Atlantic Richfield and the Forest Service contains contribution protection language subject to CERCLA section 113(f)(2). (Atlantic Richfield Comments, at 2-4.) Atlantic Richfield mischaracterizes CERCLA and the Consent Decree. The Consent Decree has no bearing on the Tailings CAO.

CERCLA Section 113(f)(2) provides in relevant part that:

> A person who has resolved its liability to the United States or a State in an administrative or judicially approved settlement shall not be liable for claims for contribution regarding matters addressed in the settlement....

(42 USC § 9613, subd. (f)(2).)

Atlantic Richfield ignores that the term "claims for contribution" used in Section 113(f)(2) means only those claims brought pursuant to Section 113(f)(1), which authorizes:

> Any person [to] seek contribution from any other person who is liable or potentially liable under [Section 107(a)] during or following any civil action under [Sections 106 or 107(a)]... Nothing in this subsection shall diminish the right of any person to bring an action for contribution in the absence of a civil action under [Sections 106 or 107(a)].

(42 USC § 9613, subd. (f)(1).)

[6] Consent Decree entered June 13, 2005, United States District Court for the Eastern District of California, Case No. 2:05-cv-00686-GEB-DAD (Prosecution Team Exhibit 12). The Central Valley Water Board may take official notice of the fact stipulations in the Consent Decree pursuant to Title 23, California Code of Regulations, section 648.2. The Prosecution Team requests that the Board take such notice.

The Consent Decree resolved an action brought by the Forest Service against Atlantic Richfield under CERCLA Section 107(a) regarding contamination at the Tailings.[7] Section 113(f)(2) would protect Atlantic Richfield only if the Central Valley Water Board: (1) was a potentially responsible party (PRP) at the Tailings; and (2) is now seeking contribution as contemplated under Section 113(f)(1). Neither is present here.

Atlantic Richfield's cited cases (on page 4 of its comments) are inapposite because they all involve CERCLA contribution claims by parties who themselves were PRPs, and in each case the state was a party to the relevant consent decree. None involved a challenge to a non-party state agency proceeding commenced pursuant to federally delegated state authority.

Finally, Atlantic Richfield ignores language within the Consent Decree recognizing that non-parties are unaffected:

> Nothing in this Consent Decree shall be construed to create any rights in, or grant any cause of action to, any person not a liable Party to this Consent Decree. The preceding sentence shall not be construed to waive or nullify any rights that any person not a signatory to this decree may have under applicable law.

(Consent Decree, IX.18, p. 14.)

The Consent Decree does not shield Atlantic Richfield from administrative enforcement actions brought under the Water Code because the Central Valley Water Board was not a party to Consent Decree. CERCLA does not authorize the Forest Service or a federal court to independently discharge Atlantic Richfield's liability under the Water Code. Instead, Section 302(d) and the other sections quoted above reserve the Central Valley Water Board's authority to enforce the Water Code at the Tailings despite the ongoing CERCLA action.

b. Atlantic Richfield's other CERCLA citations are not relevant

Atlantic Richfield cites CERCLA Section 113(b) for the proposition that the federal court has exclusive jurisdiction over all remedial actions at the Tailings. (Atlantic Richfield Comments, at 4-5.) Section 113(b) grants federal district courts "exclusive original jurisdiction over all controversies arising under [CERCLA]." (42 USC. § 9613, subd. (b).) When read in conjunction with Section 113(h), Section 113(b) makes clear that federal district courts are the sole venue to hear "challenges" to CERCLA remedial actions. (*Fort Ord Toxics Project v. California EPA* (9th Cir. 1999) 189 F.3d 828, 832.) But the

[7] There is no CERCLA action at the Mine. The Consent Decree addresses only contamination at "the Walker Mine Tailings Site, encompassing approximately 100 acres, located in the Plumas National Forest in Plumas County." (Consent Decree, at p. 8.)

Tailings CAO does not arise under CERCLA and, as described above, is not a "challenge" to the ongoing CERCLA action. Section 113(b) does not apply.

Atlantic Richfield's discussion of Section 112(e)(6) is perplexing because that section prohibits potentially responsible parties from undertaking CERCLA remedial action at facilities unless such action has been authorized by the President. (42 USC § 9622, subd. (e).) The Tailings CAO directs the Forest Service and Atlantic Richfield to achieve compliance with California water quality standards pursuant to Water Code authority. The Tailings CAO does not purport to dictate CERCLA remedial action. Section 112(e)(6) does not apply.

c. The Consent Decree does not trigger Code of Civil Procedure § 877 protection for Atlantic Richfield against the Central Valley Water Board's Water Code authority

Atlantic Richfield cites California Code of Civil Procedure section 877 for the proposition that the Consent Decree shields it from Water Code liability at the Tailings. (Atlantic Richfield Comments, at 5.) Section 877 provides that settlement releases or covenants not to sue may shield settling parties from contribution claims by joint tortfeasors. Neither the Tailings CAO nor the Consent Decree arise in tort, so section 877 is per se inapplicable. Moreover, Atlantic Richfield does not explain how the Consent Decree's settlement of CERCLA liability can have any effect on Atlantic Richfield's Water Code liability. The Central Valley Water Board is not a party to the Consent Decree and the Forest Service cannot independently absolve Atlantic Richfield's Water Code liability. The Consent Decree is not a bar to the Tailings CAO.

d. Atlantic Richfield is liable for the Walker Mine and Tailings as successor to Anaconda Copper Company and International Smelting and Refining Company, who directed pollution-causing activities at the Mine and Tailings

The Walker Mining Company (Walker) acquired the mine in 1915, and began mining around 1916. International Smelting and Refining Company (International) acquired the controlling interest in Walker in 1918. International was a wholly-owned subsidiary of, and later merged into, the Anaconda Copper Mining Company (Anaconda). Atlantic Richfield is Anaconda's successor by merger.[8]

[8] Atlantic Richfield's status as successor to the liabilities of Anaconda and International is not at issue. Atlantic Richfield concedes such status here. (See Atlantic Richfield Comments, at 2 [referring to International and Anaconda as Atlantic Richfield's "predecessors"] and pp. 4-5 [noting that "[International]... merged into Anaconda, which later merged into Atlantic Richfield...."]; see also Consent Decree entered June 13, 2005 (Prosecution Team Exhibit 8), at Part I.G ["[a]fter the Walker Mine closed, International merged into Anaconda, and Anaconda merged into Atlantic Richfield Company...."].) Moreover, Atlantic Richfield's successor status has been the subject of prior court decisions, including *Hudson Riverkeeper Fund, Inc. v. Atlantic Richfield Company* (S.D. New York 2001) 138 F.Supp. 2d 482 at 484, 487). The Central Valley Water Board may take official notice of the fact stipulations in the Consent Decree and prior court decisions pursuant to 23 CCR § 648.2.

A "bedrock principle" of corporate law provides that a corporation and its stockholders (even where the only stockholder is a parent corporation) are generally to be treated as separate entities and that limited liability is the rule. (*United States v. Bestfoods* (1998) 524 U.S. 51, 61.) However, *Bestfoods* describes that parent corporations may be liable for the acts of subsidiaries in either of two situations: (1) when the subsidiary is the "alter ego" of the parent (this is often called the "indirect" liability theory); or (2) when the parent is the operator of the pollution-causing activities (this is often called the "operator" or "direct" liability theory).

Atlantic Richfield is liable under the operator liability theory because Anaconda and International operated the mine concurrently with Walker and directed activities that resulted in the condition of discharge and threatened discharge at the Mine and Tailings.

i. A parent corporation is liable as an operator where it directs pollution-causing activities at a subsidiary's facility

Under *Bestfoods*, operator liability occurs where the parent corporation operated the subsidiary's facility and directed the activities that caused the pollution. The critical question is "not whether the parent operates the subsidiary, but rather whether it operates the facility, and that operation is evidenced by participation in the activities of the facility, not the subsidiary." (*Bestfoods*, 54 U.S. at 68 [internal citations omitted].) "Participation" includes directing the physical operations underlying the alleged liability. (*Bestfoods*, at 66-67.)

Parent corporations are not liable where their activities are consistent with "norms of corporate behavior" befitting the parent's status as an investor, such as monitoring performance, supervision of the subsidiary's finance and capital budget decisions, and articulation of general policies and procedures. (*Bestfoods*, at 71-72.)

On the other hand, parent corporations are liable where their activities go beyond acceptable norms of corporate behavior, for example, where the parent operates alongside the subsidiary at the facility (e.g., in a joint venture), a dual officeholder acts on the parent's behalf at the facility, or where an employee or agent of the parent directs activities at the facility. (*Bestfoods*, at 71.)

Operator liability "attaches if the defendant had authority to control the cause of the contamination at the time the hazardous substances were released into the environment" and actually exercised such control. (*Kaiser Aluminum & Chem. Corp. v. Catellus Dev. Corp.* (9th Cir. 1992) 976 F.2d 1338, 1341-42; see also *Long Beach Unified School District v. Dorothy B. Godwin California Living Trust* (9th Cir. 1994) 32 F.3d 1364, 1367 [operator liability attaches where an entity plays an active role in running a facility].) The degree of control required for operator liability depends on the

facts, and requires consideration of the totality of the circumstances. (Co*eur D'Alene Tribe v. ASARCO Inc.* (D.Idaho 2003) 280 F.Supp.2d 1094, 1127.)

Atlantic Richfield argues on page 8 of its Comments that the Board must provide evidence that Anaconda or International specifically directed the placement of mine waste at the Mine or Tailings. Atlantic Richfield reads the cases too narrowly. Substantial evidence in the record demonstrates that Anaconda and International specifically directed the development and mining operations which created the waste at issue here, and that is sufficient to trigger operator liability.[9] Moreover, substantial evidence in the record demonstrates that Anaconda and International's control was so pervasive that it is reasonable to assume that they *did* direct placement of waste at the Mine and Tailings.

ii. Pollution-causing activities at the Walker Mine and Tailings

The Walker Mine was an underground drift mining operation. "Drifts" and cross-cuts are the operational faces of the underground mine workings where raw ore is collected for removal through tunnels and portals. Drifts and other underground mine workings are placed and aligned according to the results of exploration and development activities, which take place throughout the period of mining as a necessary component of keeping the mine operating. At Walker, the ore was processed in an above-ground onsite concentrator before being shipped to Utah for smelting. Thus, exploration, development, drifts and other mining operations are the sources of all mine waste at Walker Mine and Tailings. In addition, the abandoned underground mine workings are now conduits by which groundwater becomes acid mine drainage (AMD) through contact with exposed ore and mine waste within the underground workings, and by which the AMD and other waste would reach the surface but for the mine seal in the 700 level adit.

iii. Anaconda and International directed exploration and mine operation activities resulting in the discharge and threatened discharge of waste at Walker Mine and Tailings

Atlantic Richfield argues that the record does not demonstrate that Anaconda or International actually controlled the Walker Mine (Atlantic Richfield Comments, at 9-10). Atlantic Richfield is incorrect. Substantial evidence in the record demonstrates that Anaconda and International directed specific exploration and development activities at Walker Mine beginning in at least the early 1920s and continuing until such activities ceased in approximately 1941. Moreover, substantial evidence in the record shows that Anaconda and International directed specific mining operations, e.g., the location and direction of mining drifts and other underground workings. These activities went far

[9] In contrast, the alter ego theory requires evidence of a unity of interest and ownership plus evidence of fraud, injustice or inequity sufficient to "pierce the corporate veil." Atlantic Richfield argues that it cannot be subject to liability under the alter ego theory. (Atlantic Richfield Comments, at 6-8.) The earlier draft Mine CAO references the alter ego theory in the alternative. Based on the available evidence, the Central Valley Water Board has removed those references from the proposed final CAO, but reserves the right to bring such claims.

beyond normal corporate oversight and created the current discharge and threatened discharge at the Mine and Tailings.

1. The record consists of Anaconda and International's business records, other relevant documents and expert testimony regarding those records

The Central Valley Water Board has long been concerned about discharges from Walker Mine and Tailings. As described in the Mine CAO, the Central Valley Water Board earlier reached legal settlements with the available owners and prior owners of the Mine. The Board proposed to name Atlantic Richfield alongside the Forest Service as a discharger for the Tailings, and as sole discharger at the Mine, in the late 1990s, but Atlantic Richfield resisted. Based on the evidence available at that time, the Board did not press the issue. But the discharge and threatened discharge continued.

Central Valley Water Board staff has since undertaken the laborious task of identifying and gathering historical records documenting Anaconda and International's involvement at the Walker Mine. This search uncovered a large number of records not previously before the Board which demonstrate that Anaconda and International were directly involved in operating the Walker Mine. These records come primarily from the Montana Historical Society, and the Anaconda Geological Documents Collection at the University of Wyoming's American Heritage Center. (Declaration of Jeff Huggins in Support of Walker Mine and Tailings Cleanup and Abatement Orders [Huggins Declaration], at ¶¶ 7-12.) A large number of the most relevant records are indexed with Prosecution Exhibit 1. All of the archive documents are included electronically in the record.

The Montana Historical Society is a state agency tasked with acquiring and preserving historical records, and with making such records available for public review. Central Valley Water Board staff obtained documents from the Montana Historical Society by contacting the Historical Society and searching the Society's indexed records. (Huggins Declaration, at ¶ 8.) Relevant documents obtained from the Montana Historical Society are listed in the Index to Prosecution Exhibit 1 as Items 5-9, 13, 69 and 71-73.

The Anaconda Geological Documents Collection is a public archive of Anaconda's business records documenting geological exploration and development work in the United States and beyond. The Collection contains records of mining and exploration studies, reports, data, maps and correspondence relating to Anaconda's activities. (Huggins Declaration, at ¶ 9.) The University of Wyoming accepted the collection in approximately 1987 (donated by Atlantic Richfield), and maintains a searchable online index of the Collection for public access, funded by membership fees. Central Valley Water Board staff obtained a membership to the Collection, and obtained the documents listed in the Index to Prosecution Exhibit 1 as Items 1-339 (except Items 5-9, 13, 69 and 71-73). (Huggins Declaration, at ¶¶ 10-12.)

The Anaconda Geological Documents Collection contains documents from Anaconda's Geological Department, and as such the Collection tends to focus on Anaconda and International's control over exploration and development activities (e.g., identifying areas of ore and plotting drifts to reach it) at the Walker Mine. But a number of the documents also discuss Anaconda and International's control over mining operations (e.g., extracting ore through drifts).

Taken as a whole, the documents in Exhibit 1 constitute substantial evidence that Anaconda and International staff directed pollution-causing activities and operated the Walker Mine and Tailings concurrently with Walker staff, and in most cases with greater authority than Walker staff. This conclusion is supported by Dr. Fredric Quivik, the Central Valley Water Board's expert witness. Dr. Quivik's expert qualifications and findings are set forth in his Statement (Prosecution Exhibit 2) and are incorporated by reference here. Dr. Quivik has reviewed the documents in Prosecution Exhibit 1 and concludes, among other things, that:

> [T]he Anaconda Copper Mining Company developed a tightly-managed corporate structure that allowed top managers of the parent corporation to direct the operations of its several subsidiaries and far-flung operations. Anaconda's top managers in the areas of geology, mining, and metallurgy directed those facets of operations in [Anaconda's] subsidiaries, including the Walker Mining Company.... In this respect, [Anaconda] and its subsidiary International managed the Walker mine concurrently with the Walker Mining Company from 1918 to 1941.

(Quivik Declaration, at 8.)

2. Anaconda and International directed specific pollution-causing exploration and mine operation activities at the Walker Mine beginning in at least the early 1920s

International owned 50.4% of Walker Mining Company's stock beginning in 1918; Anaconda owned 100% of International's stock and controlled all aspects of International's operations. (Quivik Declaration, at 13 [Anaconda exercised its option to purchase 630,000 out of 1,250,000 shares in the Walker Mining Company on 1 October 1918].) Mine development and operations began almost immediately after acquisition. (*Id.* at 13-15.)

By the early 1920s, Anaconda and International had established a clear practice of directing specific activities at the mine. (See, e.g., Quivik Declaration, at 15-16 [describing pattern of activities].) Anaconda and International management and staff (who were not also management or staff at Walker Mining Company) regularly visited the facility to provide highly specialized geological services for mine development and operations. These services were not in the manner of mere technical consultation. Instead, Anaconda and International continuously directed specific development and

mining activities. For example, correspondence from Paul Billingsley, of International, to J.O. Elton,[10] dated 12 December 1923 (Exhibit 1, Item 17), describes site visits and provides specific direction regarding development and operation of mining drifts. The letter also describes site visits and directions from Murl Gidel, of Anaconda, and attaches specific direction from him, approved by Billingsley.

A similar letter from Billingsley to V.A. Hart, Walker's on-site manager, provides specific direction regarding placement of specific drifts and cross-cuts and closes by directing that the letter served as "authorization to start the above work." (Letter from Paul Billingsley to V.A. Hart, Exhibit 1, Item 16, at 2.) The record is filled with similar examples where Billingsley regularly visited the Walker Mine and provided specific direction regarding the development of mining drifts on behalf of International.

Anaconda staff also directed specific activities at Walker Mine during this period. Reno Sales served as Chief Geologist for Anaconda throughout the operation of the Walker Mine, and, like Billingsley, regularly visited the site and directed specific activities. (See, eg, letters from Sales to Elton and Tunnell [Walker's then-onsite manager] dated 6 July 1925 [Exhibit 1, Item 32] [providing specific direction regarding mining claims] and letter from Sales to B.B. Thayer dated 20 July 1925 [Exhibit 1, Item 34] [describing site visits and providing direction for ore development steps].)

Reno Sales was a geologist and manager of substantial renown, and the chain-of-command he maintained over Walker through Billingsley was quite rigid. As Atlantic Richfield points out, V.A. Hart occasionally disobeyed directives from Sales and Billingsley, and was chastised for it. The 20 September 1923, letter from Sales to Billingsley (Exhibit 1, Item 15) describes how Sales expected Hart to obey Anaconda's direction, and that Walker staff should come directly to Sales with geological questions or problems, rather than going through Elton.[11] V.A. Hart was removed from the Walker Mine by 1925, and later onsite managers apparently obeyed directives from Anaconda and International.

Perhaps what is most telling about the record from the 1920s is the degree to which decisions were made and specific direction given by and between Anaconda and International staff without input from Walker staff. For example, the 29 March 1926 letter from Billingsley to William Daly, Anaconda's Manager of Mines (Exhibit 1, Item 57), provides a detailed account of Billingsley's directions regarding development operations at Walker Mine, far beyond any definition of corporate oversight. A letter dated 9 February 1926, from Sales to Billingsley describes a site visit made by Daly, who was responsible for operational matters, and notes that Kelley, Anaconda's then-Vice President, authorized specific work at Walker Mine. (Exhibit 1, Item 53). A similar series

[10] J.O. Elton worked for International and served as Vice President and Director of the Walker Mining Company.
[11] Notably, Elton wrote to Walker's onsite manager on January 18, 1924 (Exh. 1, Item 18), reiterating Sales' directive to "adhere strictly" to Billingsley's recommendations. The same letter describes how Walker onsite managers sought and obtained via telegram authorization from International to change drift direction. The use of telegram indicates the urgency of the matter and the importance of International's authorization.

of correspondence took place on 5, 12 and 23 May 1925 (Exhibit 1, Items 29-31). These directives were generally passed directly to Walker staff without being passed through J.O. Elton, who under a normal corporate parent-subsidiary relationship would have been the appropriate conduit for such communications; Anaconda and International staff routinely provided direction to Walker staff without going through Elton. (Quivik Declaration, at 27.)

The record also shows that Anaconda, International and Walker occasionally used joint letterhead during this period (e.g., Exhibit 1, Item 13), which further demonstrates that Anaconda and International operated the Mine concurrently with Walker. (See also Quivik Declaration, at 30 [describing that the use of joint letterhead demonstrates "how fully the Walker Mining Company was integrated into the International operations management system."].)

3. Anaconda and International continued to direct specific exploration and mine operation activities at the Walker Mine into the early 1940s

Anaconda and International's direct involvement in Walker Mine development and operations appears to have strengthened through time. By 1939, the onsite manager at Walker Mine regularly sought specific approval from International and Anaconda regarding development and operational matters. For example, a letter dated 25 January 1939, from S.K. Droubay (Walker's geologist) to Tom Lyon (International) seeks Lyon's approval for development recommendations. (Exhibit 1, Item 151.) Letters from Reno Sales to Elton and Droubay later in 1939 and 1940 provide similar direction and approvals. (Exhibit 1, Items 167 & 168 [1939 letters] and Item 217 [1940 letter].) Droubay continued to seek direction from Anaconda and International. (See letter dated 19 December 1939 [Exhibit 1, Item 211] [seeking direction regarding drift placement].)

Clyde Weed, Anaconda's General Manager of Mines (responsible for mine operations) was also directly involved during the period. In a letter to Elton dated 8 May 1940, Weed directed Walker staff to follow specific direction from Sales. (Exhibit 1, Item 234.) Weed and Sales regularly discussed the Walker Mine development and operations, and provided specific direction, most notably regarding the placement of drifts. (Exhibit 1, Item 244.) The Anaconda Geological Collection's records for the later period (~1939-1941) contain numerous examples of specific direction to Walker from Anaconda's Mining and Geological departments. (See, eg, Exhibit 1, Items 140-160, 168-204; see also Quivik Declaration, at 37 ["In the late 1930s, Reno Sales continued to direct work routinely in the Walker mine based on his position as [Anaconda's] chief geologist."].)

Dr. Quivik succinctly summarizes the operational structure during this time as "three men, Sales, Gidel, and Weed, who had no official roles at the Walker Mining Company, were deciding the course of development at the Walker mine, and they informed a fourth, Tom Lyon, of their decisions. As with the other three, Lyon was a man in

authority [with International], but he held no office in the Walker Mining Company." (Quivik Declaration, at 37.)

4. Walker continually sought specific direction from Anaconda and International on urgent matters

The regular correspondence in the record is, by itself, sufficient to demonstrate that Anaconda and International operated the mine concurrently with Walker. The record also contains numerous examples instances where Walker sought and obtained specific authorization and direction from Anaconda and International via wire telegram and air mail in emergency situations. For example, in a series of telegrams on 1 and 2 January 1940 (Exhibit 1, Items 216-217), Walker sought and obtained specific direction and authorization directly from Reno Sales regarding placement of drilling holes in urgent circumstances. Other examples include telegrams and air mail dated 18 January 1924 (Item 18), 16 April 1926 (Item 61), 31 May 1926 (Item 63), 1 June 1926 (Item 64), 16 November 1939 (Item 204), 19&20 December 1939 (Items 211-212), and multiple instances in January 1941 (Items 215-217). Air mail and telegrams were extraordinary means of communication at the time, and would not be used for routine communications between general technical consultants and clients. (See Quivik Declaration, at 42 [describing the November 1939 urgent matter, and noting that "[o]nce the immediate situation was resolved, Sales and Droubay continued normal correspondence through the mail, with Lyon participating."].) The air mail and telegram communications in the record here further demonstrate that Walker considered Anaconda and International staff to be directly involved in Walker Mine development and mining operations throughout the entire period of mining operations.

e. Water Code § 13304(j) does not apply because the operators created a public nuisance

Atlantic Richfield cites Water Code section 13304, subdivision (j), for the proposition that Atlantic Richfield cannot be held liable for acts occurring before 1981. (Atlantic Richfield Comments, at 10.) Section 13304(j) provides that "This section does not impose any new liability for acts occurring before January 1, 1981, if the acts were not in violation of existing laws or regulations at the time they occurred." (Water Code § 13304, subd. (j).)

Atlantic Richfield ignores that California law has prohibited the creation or continuation of a public nuisance since 1872 (Civil Code § 3490) and that water pollution is a public nuisance. (*People v. Truckee Lumber Co.* (1897) 116 Cal. 397; see also *Carter v. Chotiner* (1930) 210 Cal. 288, 291 ["[t]here is no doubt that pollution of water constitutes a nuisance."].) Moreover, it has long been established as a matter of California law that the creation of the original condition leading to the nuisance is not necessary for liability. (*City of Turlock v. Bristow* (Cal. App. 3 Dist. 1930) 103 Cal.App. 750, 755 ["Every successive owner of real property who neglects to abate a continuing nuisance upon, or

in the use of such property created by the former owner, is liable therefore in the same manner as the one who first created it."]; see also Cal. Civ. Code § 3483.)

Atlantic Richfield also ignores that the State Water Resources Control Board has repeatedly held parties situated similarly to Atlantic Richfield to be liable under similar circumstances. (See *In the Matter of the Petitions of Aluminum Company of America; Alcoa Construction Systems, Inc.; and Challenge Developments, Inc.* (July 22, 1993) Cal.St.Wat.Res.Bd., Order No. WQ 93-9, 4 [1993 WL 303166] [holding that the retroactive bar now set forth in 13304(j) does not apply even though the mine had ceased operations around 1930]; and *In the Matter of the Petitions of County of San Diego, City of National City, and City of National City Community Development Commission* (Feb. 22, 1996) Cal.St.Wat.Res.Bd. Order No. WQ 96-2, 4 [1996 WL 34481302] [operator of a landfill from 1960 to 1963 is a discharger under section 13304 because the continuing release of pollutants from the landfill into groundwater violated California law at the time].)

The record contains substantial evidence that Atlantic Richfield's predecessors operated the Walker Mine and Tailings from approximately 1918 through 1941, and that Atlantic Richfield's predecessors operated and abandoned the Mine and Tailings in a condition that created a public nuisance, i.e., a continuing discharge of copper and mine waste from the Walker Mine and Tailings, including discharges that eradicated all life in Little Grizzly Creek for several miles downstream prior to installation of the mine seal. Section 13304(j) is not a bar here.

f. California Code of Civil Procedure § 338(i) does not apply to cleanup and abatement orders

Atlantic Richfield cites California Code of Civil Procedure section 338(i) for the proposition that the Central Valley Water Board is time barred from issuing the Mine and Tailings CAOs. (Atlantic Richfield Comments, at 10.) Atlantic Richfield acknowledges State Water Resources Board precedent, *In re Trans-Tech Resources*, Order No. WQ 89-14, holding that Section 338(i) does not apply in administrative cases. (*Id.*) Atlantic Richfield suggest that *In re Trans-Tech* should be overturned, but fails to cite any authority in support. Moreover, Atlantic Richfield completely ignores *City of Oakland v. Public Employees' Retirement System* (2002) 95 Cal.App.4th 29, 48, which supports the *In re Trans-Tech* holding. There is no basis for overturning *In re Trans-Tech*, and Section 338(i) is not a bar here.

g. Water Code § 13304(c)(1) allows recovery of past costs through administrative proceedings

Atlantic Richfield argues that the Central Valley Water Board cannot recover past costs through the Mine CAO. (Atlantic Richfield Comments, at 11.) Water Code section 13304, subdivision (c)(1), authorizes the Central Valley Water Board to file a court action to recover unpaid costs, but it does not require a court action. Rather, Water

Code section 13304 provides the framework for administrative orders regarding both cleanup and cost recovery. The Mine CAO properly provides for recovery of the Central Valley Water Board's past costs and future oversight costs.

h. There is no basis to allocate liability

Atlantic Richfield argues that the Forest Service and the Central Valley Water Board should be the "primary" responsible parties for the Tailings CAO and Mine CAO, respectively. (Atlantic Richfield Comments, at 11.) Atlantic Richfield cites State Water Board decisions suggesting that, where appropriate, the Regional Board may specify the roles of responsible parties under cleanup and abatement orders. But Atlantic Richfield ignores the general intent that liability under section 13304 be applied jointly and severally. (See *In the Matter of the Petition of Union Oil Company of California* , Order No. WQ 90-2, at 4 ["[W]e consider all dischargers jointly and severally liable of discharges of waste...."].) The Central Valley Water Board is not required to allocate liability, and in any event the circumstances here do not suggest that Atlantic Richfield should be secondarily liable.[12] Both the Forest Service and Atlantic Richfield are equally responsible for the Tailings, and Atlantic Richfield is the only remaining responsible party at the Mine.[13]

Moreover, the Central Valley Water Board is not a discharger at the Mine. The Central Valley Water Board installed the mine seal pursuant to Resolution No. 86-057 [Prosecution Team Exhibit 13] in order to halt waste discharges from the underground workings through the mine's portal. The Central Valley Water Board's activities have since been limited to inspections of the seal and water quality sampling throughout the Mine and Tailings, in addition to rehabilitation of the portal tunnel and installing drainage ditches to reduce surface inflow to the upper mine openings. None of the Board's activities have caused discharge, and therefore do not create discharger liability.

VIII. Changes to the final CAOs

The Prosecution Team's Submittal CD contains redline versions of the proposed CAOs showing changes made since the 3 June 2013 comment drafts.

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[12] State Water Resources Control Board orders regarding allocation all support the conclusion that Atlantic Richfield, as successor to the operator, should be primarily liable. Such orders distinguish between those parties who are considered responsible solely due to their land ownership (or status as lessee) and those parties who actually operated the facility or otherwise caused the discharge in question. See Order Nos. WQ 86-11 (landowner and operator named in waste discharge requirements; operator primarily responsible for compliance); 86-18 (landowner and manufacturer of semiconductors named in site cleanup requirements; manufacturer primarily responsible); 87-5 (landowner and operator named in waste discharge requirements; mine operator primarily responsible); 92-13 (landowners held secondarily liable in cleanup and abatement order; operators considered primarily liable). This distinction is made primarily for equitable reasons – to hold the party who created the discharge to be initially responsible for cleanup. (See Order No. WQ 89-1, p. 4.)

[13] As described in the Mine CAO, the Central Valley Water Board has previously reached settlements with the other viable responsible parties at the Mine.

a. Changes to Tailings CAO based on Forest Service Comments

The Tailings CAO has been amended to reflect the Forest Service's comments and incorporate these responses (new finding 45), and to describe the Forest Service's continuing failure to comply with Order R5-00-028 (revised findings 18, 19 and 21).

b. Changes to the Mine and Tailings CAOs based on Atlantic Richfield's Comments

The Tailings CAO and Mine CAO have been amended in light of Atlantic Richfield's comments to delete reference to the "alter ego" theory of corporate liability (former finding 28 of the Tailings CAO and former finding 37 of the Mine CAO). Paragraph 2 of the Tailings Order and Paragraph 3 of the Mine Order have been revised to reference Water Code section 13304, subdivision (c)(1), rather than section 13305.

c. Other changes to the Mine and Tailings CAOs

The Walker Mine title report has been moved from Attachment E of the Mine CAO to Prosecution Exhibit 48. The historical archive documents have been moved from the CAO attachments to Prosecution Exhibit 1. The compliance dates in both CAOs have been updated to reflect the timing of issuance. Finding 24 in the Tailings CAO and finding 25 in the Mine CAO have been added to describe drift mining operations. Findings 35 through 37 (formerly 34 through 36) of the Mine CAO and findings 27 through 29 (formerly 26 through 28) of the Tailings CAO have been revised to address specific findings regarding Anaconda and International. Findings 41 and 42 of the Tailings CAO have been revised to clarify the Forest Service's violation of Order R5-00-028, and to clarify scope of the necessary actions. Both CAOs have been revised to incorporate this Response to Comments document (new finding 46 of the Tailings CAO and new finding 55 of the Mine CAO). The CEQA review language and the Order sections of both CAOs have been revised to the current CAO format.

IX. Conclusion

For the reasons stated above, the Central Valley Water Board should adopt the Walker Mine CAO (R5-2014-YYYY) and Walker Mine Tailings CAO (R5-2014-XXXX) as proposed.

For the Prosecution Team:

Andrew Tauriainen

ANDREW TAURIAINEN
Senior Staff Counsel
Office of Enforcement

Exhibit 36

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2014-XXXX

ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE

WALKER MINE TAILINGS
PLUMAS COUNTY

CLEANUP AND ABATEMENT ORDER NO. R5-2014-YYYY

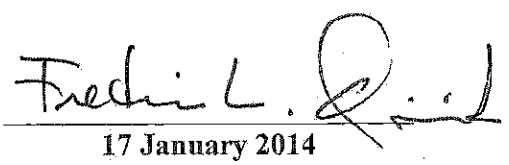
ATLANTIC RICHFIELD COMPANY

WALKER MINE
PLUMAS COUNTY

EXPERT WITNESS STATEMENT

of

FREDRIC L. QUIVIK, PhD.



17 January 2014

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I. GENERAL REMARKS

A. Statement of the Problem

The Walker mine, located in Plumas County, California, produced copper ore during the period 1916-1941. The Walker Mining Company, which operated the mine, was controlled by the International Smelting & Refining Company. International was in turn a wholly-owned subsidiary of the Anaconda Copper Mining Company (ACM), which changed its name to The Anaconda Company in 1955. The Atlantic Richfield Corporation (ARCO) acquired and merged with The Anaconda Company in 1977. The mine is now discharging copper and other pollutants into the Little Grizzly Creek watershed, and threatens to discharge acid mine drainage as well. The California Regional Water Quality Control Board for the Central Valley Region, which has jurisdiction over such discharges, has investigated conditions at the Walker mine and proposed separate Cleanup and Abatement Orders regarding the Mine and Tailings against ARCO, the oil company that is the corporate successor to the ACM.

B. My Assignment/Personal Background/Qualifications

My name is Fredric L. Quivik. I am a historian by profession. My specialty is the history of technology and industrial history. I am the author of the following witness statement on the matter of the Central Valley Regional Water Board's proposed Cleanup and Abatement Orders regarding the Walker Mine and Tailings (R5-2014-XXXX and R5-2014-YYYY) against ARCO.

In August 2013, the California Regional Water Quality Control Board for the Central Valley Region asked me to investigate the history of the Anaconda Copper Mining Company and its relationship with the Walker Mining Company, which operated the Walker mine in Plumas County, California. The Water Board asked me to pay particular attention to the question of whether officials of the ACM or its subsidiary International managed or directed the operations of the Walker Mining Company at the Walker mine.

As an industrial historian, I am academically trained in the history of technology and I have extensive experience in the field of industrial history, both in the context of litigation and in other applications. I earned a PhD in History and Sociology of Science from the University of Pennsylvania, and I have developed expertise in the history of technology, especially mineral processing technologies, as well as expertise in related fields, such as the history of big construction projects like bridges and dams. I have worked as a consultant since 1982, when I formed an historic preservation consulting firm, Renewable Technologies, Inc. (RTI), in Butte, Montana. Through both my academic training and my professional experiences, I have developed expertise in using the historical method.

The historical method is well-established and widely used by reputable historians in conducting inquiries and reaching conclusions. It allows historians to ask questions about the past which spring from our concerns in the present. The purpose of the historical method is to allow a historian to reconstruct, as reliably as possible, a truthful rendition of occurrences in the past. It involves developing questions to guide research, finding sources of information that

allow one to answer those questions, evaluating the authenticity and credibility of the information, and then using the information to create a coherent and verifiable narrative recitation of the past. Such a work of history must include sufficient detailed references to the sources of information upon which it relies to allow a reader to evaluate the work.

In the process of my academic course work and professional experience, I have had to demonstrate my ability to use the historical method, both by evaluating the effectiveness of various other authors and scholars in applying the historical method, and by writing research reports using the historical method.

I received a Bachelor of Arts degree from St. Olaf College in Northfield, Minnesota, in 1971. As part of my coursework, I took classes in mathematics and the sciences; my science courses included chemistry and physics. In those classes, I was introduced to the scientific method. The scientific method involves developing hypotheses and conducting tests in a laboratory or the field to test those hypotheses. I also learned how the scientific method had evolved historically. This knowledge about the scientific method has helped me to identify problems that need to be solved, and to decide how to approach them from a scientific viewpoint, and is thus relevant to my work as a historian of technology.

I earned a Bachelor of Environmental Design from the School of Architecture at the University of Minnesota in Minneapolis in 1975. Through that course work, I increased my general familiarity with the engineering profession with more specific knowledge about the kinds of problems that engineers address and how they solve them. I also took courses in architectural history, the history of technology, and American history, all of which provided me with important background and experience.

I then obtained a Master of Science in Historic Preservation from the Graduate School of Architecture & Planning at Columbia University in New York City. At Columbia, I took courses in preservation design and American architecture. I also took graduate courses in the History Department. The graduate courses in history provided my first formal introduction to the historical method. I learned and applied the method in papers I wrote at Columbia.

In 1990, after working for more than thirteen years in Butte, Montana, I decided to return to graduate school and work toward a PhD in the history of technology. I was accepted into the Department of History and Sociology of Science at the University of Pennsylvania in Philadelphia. The history of technology program in the Department of History and Sociology of Science is widely regarded as one of the best in the United States. Through my course work for the PhD at Penn, which I received in 1998, I gained further training in history and the historical method. I chose to focus my scholarly work on industrial history and in particular the history of mining and mineral processing.

While at Penn, I worked as a research assistant to Professor Thomas Parke Hughes, who at one time had been Chairman of the Department of the History and Sociology of Science. One of Professor Hughes' specialties was the study of the organization and management of complex, large-scale technological systems. Through my work for Professor Hughes, and the courses that I took with him, I learned to analyze historical examples of such systems. I also received more

intensive training in historical methods, research and writing. I have used this experience with Professor Hughes in my work as an expert witness, especially in the Pinal Creek, Midnite Mine, and Lava Cap cases described below. In each of those three cases, the major focus of my work was on the organization and management of a mining enterprise which was diverse geographically and which had key managers located at considerable distance from actual mining operations.

After completing course work and passing qualifying exams for the PhD degree, I worked on my dissertation. A PhD dissertation is a work of significant and original scholarship. My dissertation is entitled "Smoke and Tailings: An Environmental History of Copper Smelting Technologies in Montana 1880-1930." Completed in 1998, my dissertation is a historical analysis of the mining and metallurgical technologies employed by the Anaconda Copper Mining Company and its predecessors in Butte and Anaconda, and in particular the ways in which those technologies interacted with the environment. Because of my knowledge and training in history and the history of technology, I was able to understand the technologies and then to research and analyze how developments in metallurgy were related to political and legal conflicts of the time concerning the impacts of those technologies on the environment.

While a student at Penn, I prepared and presented several papers at scholarly conferences. The papers were on such topics as the history of EPA's Superfund program as a technological system, and the environmental impacts of mining and smelting. Since receiving my PhD from Penn in 1998, I continue to present papers on these and other topics at scholarly conferences. I have revised some of the papers for publication. A complete list of my scholarly presentations and publications may be found in my curriculum vitae, attached to this report as Exhibit 1.

In addition to my scholarly training, I have considerable professional experience as an historian. In 1982, I founded the firm of Renewable Technologies, Inc. (RTI), a historic preservation consulting firm in Butte. I did some work in preservation architecture, but I moved my focus toward projects involving historical research and writing. I worked on an evaluation of the historic mining town of Jardine, Montana, including a survey of the structures and landscapes that were associated with mining and processing gold and tungsten ores. I also worked on projects involving old mining camps where mining companies wanted to resume mining. All of these projects involved research into relevant primary documents. To prepare myself for these projects, I studied relevant historical engineering texts that described such fields as the theory and practice of mining and metallurgy and the design and construction of bridges and dams.

During the 1980s, RTI had a contract with the Butte Historical Society to develop a master plan for the preservation and interpretation of industrial sites in Butte and Anaconda, most of which were associated with mining and metallurgical enterprises. Anaconda is the smelter city about 26 miles west of Butte. The project included researching the histories of the thirteen surviving steel head frames in Butte and their associated mine yards. It also included researching the three historic smelter sites adjacent to Anaconda. As a part of the project, I researched the corporate and technological history of the Anaconda Copper Mining Company.

During two summers while studying for the PhD at Penn, I worked for the Historic American Engineering Survey, National Park Service, researching and writing a business and

technological history of the Connellsville Coke Region in southwestern Pennsylvania. The project thereby gave me the opportunity to study large corporate combinations in the early twentieth century and to study the history of an important energy sector, that which provided metallurgical fuel to the iron and steel industry.

I also have experience as an industrial archeologist. Unlike many historians who generally derive information solely from written documents, archaeologists derive information through their analysis of artifacts. Not all information about our industrial past was written down. Industrial archeologists supplement the written record of our industrial past with information derived from artifacts. Such artifacts may be maps, illustrations, photographs, objects produced by an industrial operation, pieces of industrial equipment, buildings that house industrial equipment, entire industrial complexes or sites, or even an industrial landscape.

I became a member of the Society for Industrial Archeology in about 1980. As a result of membership in the organization, I have been able to work with others who practice in the field of industrial archeology. I have learned from their experiences about the kinds of analyses they do, and I have applied those skills in my own work. At annual meetings of the Society for Industrial Archeology, one full day is dedicated to studying industrial processes at operating industrial enterprises. The Society arranges for process tours through industrial operations, some of which are old and historic, and some of which are very modern. The purpose of these tours is to see the processes and systems of production, to talk to employees and managers, and thus to develop a better ability to understand a wide array of industrial processes. I apply these experiences when I study a particular industrial site; it makes me better able to comprehend whole systems. The information I derive from non-written sources makes me better able to understand what is described in written documents. This deeper comprehension helps me to ask more informed questions of the documents.

I served on the board of directors of the Society for Industrial Archeology for three years (1990-1993) and served as president of the organization for two years (1996-1998). Serving as president also entailed being vice president for two years (1994-1996) and past president for two years (1998-2000). Since January 2011, I have served as editor of the Society's journal, *IA: The Journal of the Society for Industrial Archeology*.

As a result of my expertise in industrial archeology, Michigan Technological University offered me a teaching position at the Associate Professor level. I accepted the offer and began teaching in January 2010. I teach courses in industrial heritage, history of technology, and environmental history in the Department of Social Sciences, which houses a graduate program in industrial archeology and industrial heritage. It is the only graduate program in industrial archeology in the U.S., offering both M.S. and PhD degrees. I am part of the group of faculty in the industrial archeology graduate program.

My expertise as a historian of technology, particularly a historian of mineral processing technologies, has been employed in several cases of Superfund litigation. Two of them involved the histories of ARCO and the Anaconda Copper Mining Company. I served as an expert historian for the United States in *U.S. v. ARCO* (the Clark Fork Superfund case in Montana). I was deposed by ARCO, but I did not testify at trial because the parties agreed to settle. I served

as an expert historian for the Pinal Creek Group in *Pinal Creek Group. v. Newmont Mining Corporation, et al* (the Pinal Creek Superfund case in Arizona). I was deposed by ARCO (one of the defendants in addition to Newmont), but I did not testify at trial because ARCO and the Pinal Creek Group agreed to settle. My opinions in the case concerned the corporate relationships between the Anaconda Copper Mining Company and its subsidiaries, including the Inspiration Consolidated Copper Company.

I have worked on four cases for which I testified at trial. I served as an expert historian for the United States in *U.S. v. Asarco, et al* (the Bunker Hill Superfund case in Idaho). My expert report concerned the history of silver, lead, and zinc mining and metallurgical operations in the Coeur d'Alene mining district. I was deposed by Asarco and the other defendant mining companies in the case, and I testified at trial in Boise, in January 2001 during the liability phase of the case and in July 2001 during the counter-claims phase. Judge Lodge ruled in favor of the U.S. citing my expert testimony in his opinion.

I served as an expert historian for the United States in *U.S. v. Newmont Mining Corporation, et al* (the Midnite Mine Superfund case in the state of Washington). I was deposed by Newmont, and I testified at trial in Spokane in July 2008. In my understanding, Newmont's defense was to assert that under U.S. corporate law a parent corporation is not liable for its subsidiary's actions; therefore, Newmont should not be held liable for its subsidiary's operations at the Midnite mine. In my expert report and in my testimony I showed that historically Newmont had managed its subsidiary's operations. Judge Quackenbush ruled that Newmont had managed its subsidiary's operations and so was liable under CERCLA as an operator of the Midnite mine. The Judge cited my testimony in his opinion (2008 WL 4621566 (E.D. Wash.)).

In November 2012, I testified for the United States in *U.S. v. Sterling Centrecorp*, the Lava Cap Superfund case in California. I testified about the history operations of the Lava Cap Mining Corporation, and I testified about the corporate relationship between Sterling Centrecorp, which acquired Lava Cap Mining Corporation's assets and liabilities, and Sterling's subsidiary Keystone Copper Corporation, which held title to the Lava Cap property. Judge England ruled in favor of the United States, citing my testimony extensively in his ruling that Sterling managed Keystone's operations (2013 WL 3166585 (E.D. Cal.)).

In December 2012, I testified for the United States in *U.S. v. Marmon Holdings*, the final trial in the series of trials concerning the Bunker Hill Superfund site in Idaho. I testified about the history of operations of the Golconda mill, which had been owned and operated by a Marmon predecessor, and my testimony included opinions concerning the Golconda mill's practice of discharging its tailings directly into the nearby stream.

I am working on one other case in which Atlantic Richfield is the defendant, *Gregory A. Christian, et al, v. BP/ARCO Corporation, et al.* My expert report offers opinions on the Anaconda Copper Mining Company's history of knowingly discharging contaminants, such as arsenic, onto the property of residents in Opportunity, Montana. ARCO has taken my deposition, but the trial has yet to be held.

C. Materials Considered and Methods Used

I used my training and experience in history and the history of technology, including the organization and management of technological systems, in writing my report in this matter. I began by developing general histories of the Walker Mining Company and the International Mining & Smelting Company operations from the 1910s through 1940s. International Smelting was a wholly-owned subsidiary of the Anaconda Copper Mining Company, a predecessor of ARCO. I developed the histories by reviewing secondary sources I had consulted in previous cases, in which I have researched the ACM, and by conducting research on the Walker Mining Company operations in *Engineering and Mining Journal*, the principal trade journal for the mining industry in the U.S., and *Mineral Resources of the United States/Minerals Yearbook*, an annual publication of the federal government summarizing major developments in the nation's mining industry.

In developing my opinions and in preparing this Declaration, I then considered the primary documents that the Water Board provided me. These are documents that a researcher at the Water Board retrieved from the Anaconda Geological Documents Collection at the American Heritage Center, University of Wyoming, and in the Papers of the Anaconda Copper Mining Company at the Archives of the Montana Historical Society. They are the kind of primary documents that a historian uses in drawing historical conclusions. As I reviewed documents for this case, I evaluated them to make sure that the information they contained was authentic and credible. The footnotes in this report comprise the list of my relied-upon documents.

D. Compensation

I am being compensated by the California Regional Water Quality Control Board as an expert witness in this matter at the rate of $180.00/hr. for pre-trial consulting and at the rate of $360.00/hr. for depositions and trial testimony.

II. SUMMARY OF OPINIONS

The purpose of this report is to provide as detailed a corporate and operational history of the Walker Mining Company and its Walker mine in California as documentation permits. Details of this history support my opinion that officials of the Anaconda Copper Mining Company and its wholly-owned subsidiary, International Smelting & Refining Company, managed the operations of the Walker mine during its roughly two decades of full-scale production. A summary of my opinions regarding the relationship between Anaconda/International and the Walker Mining Company is as follows:

A. The Walker Mining Company developed and operated the Walker mine in Plumas County, California, from 1916 to late 1941, during which time the Walker mine was an important producer of copper in California.

B. In 1918, the Anaconda Copper Mining Company, through its wholly-owned subsidiary International Smelting & Refining Company, acquired a controlling interest (50.4%) in the stock of the Walker Mining Company.

C. During its period of operation, the Walker mine was one of the major suppliers of copper concentrates to the Tooele smelter of the International Smelting & Refining Company.

D. During the time the Walker mine operated, the Anaconda Copper Mining Company was one the world's leading copper producers and one of the largest industrial corporations in the world, with mining, smelting, refining, and fabricating operations numerous locations in the United States as well as in Mexico and Chile.

E. Like other large, complex, and geographically diverse industrial enterprises of the early twentieth century, the Anaconda Copper Mining Company developed a tightly-managed corporate structure that allowed top managers of the parent corporation to direct the operations of its several subsidiaries and far-flung operations. Anaconda's top managers in the areas of geology, mining, and metallurgy directed those facets of operations in the ACM's subsidiaries, including the Walker Mining Company.

F. Although the Walker Mining Company had its own board of directors, corporate officers, and local managers, management of the Walker mine was fully integrated into the Anaconda Copper Mining Company's enterprise and its management system, so that the ACM's top managers in charge of geology, mining, and metallurgy directed activities at those area at the Walker mine. In this respect, the ACM and its subsidiary International managed the Walker mine concurrently with the Walker Mining Company from 1918 to 1941.

The main narrative of this report is divided into two sections. The first provides a chronological overview of the Anaconda Copper Mining Company, International Smelting & Refining, and the Walker Mining Company. The first section relies largely on secondary sources and on technical and professional journals from the period described. The second section is

divided into sub-sections that analyze various facets and periods in the relationship between Anaconda/International and the Walker Mining Company. It relies largely on primary sources: correspondence among ACM/International officials and managers responsible for the Walker mine, correspondence between ACM/International people and Walker Mining Company staff in California, annual reports of the Walker Mining Company, and unpublished reports produced by ACM experts during the period of the Walker mine's operation.

III. COMPLETE STATEMENT OF OPINIONS AND THE REASONS AND BASES THEREFOR:

A. CORPORATE AND OPERATIONAL HISTORIES OF INTERNATIONAL SMELTING & REFINING COMPANY AND THE WALKER MINING COMPANY

1. Historical Background of the Anaconda Copper Mining Company and the International Smelting & Refining Company

International Smelting & Refining Company was a wholly-owned subsidiary of the Anaconda Copper Mining (ACM). The two companies emerged in that parent-subsidiary relationship in 1914 after more than a decade of corporate consolidation in the copper industry. The ACM had been the largest of several large mining companies operating in Butte, the world's most productive copper-mining district at the time. The Amalgamated Copper Company, a holding company, was incorporated in 1899 to consolidate those Butte corporations, including the ACM. After Amalgamated acquired control of their stock, the companies continued to operate as distinct corporate entities until 1910, when they deeded their property to the ACM, which then became the principle operating company in Butte, consolidating nearly all the mining operations there into a single technological system. Meanwhile, International, which was another company associated with Amalgamated, was consolidating as well, so that by 1914 it owned copper smelters in Utah and Arizona, a copper refinery in New Jersey, and a lead refinery in Indiana. That year, the ACM implemented a stock exchange with International shareholders, as of result of which the ACM emerged as International's sole shareholder. In 1915, Amalgamated ceased to exist, after it transferred all its stock holdings to the ACM. Those holdings included shares in the Inspiration Consolidated Copper Mining Company in Arizona and shares in Greene-Cananea Mining. Inspiration mined copper in the same mining district where International operated its Arizona smelter.[1]

Over the next decade or so, the ACM developed a highly integrated corporate management structure, with several important individuals serving key positions on the ACM board and the boards of its subsidiaries. One was William Wraith, who began his work in Montana in 1897, three years after graduating from the Michigan College of Mines. He joined the staff of the Boston & Montana Consolidated Copper & Silver Mining Company (B&M) as an engineer. The B&M was acquired by Amalgamated in 1901 and then absorbed into the ACM in 1910. During that time, Wraith transferred to the Anaconda smelter, where he moved up the corporate organization. In early 1913, he was sent to Tooele, Utah, to take charge of the International Smelting & Refining Company's operation there, and he remained as manager after the ACM formally took possession of the Tooele smelter and reorganized the International

[1] F. Ernest Richter, "The Amalgamated Copper Company: A Closed Chapter in Corporation Finance," *The Quarterly Journal of Economics* 30 (1916): 387-407; and Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 143-144.

corporate structure. He was then placed in charge of the Andes Copper operation at Potrerillos in 1916 and transferred to New York in 1918 to take administrative charge of Andes and, in 1923, Green-Cananea and Inspiration as well.[2]

W.D. Thornton was the son of an early Butte mining entrepreneur and became one of ACM president John D. Ryan's close associates shortly after the latter moved to Butte in 1901. They worked together on many business ventures. The two were allied in the formation of the Montana Power Company, which remained closely linked to the ACM for many years and of which Ryan became president in 1913. Thornton became president of Greene-Cananea. He was instrumental in negotiating the deal whereby the facility that would become the International Smelting & Refining Company's smelter at Tooele was able to lure the Utah Consolidated Copper Company's smelting contract away from ASARCO. When the ACM formed the International Smelting Company to take over ownership and operation of the International Smelting & Refining Company's properties, Thornton was one of the new company's directors.[3]

In 1916, International was a wholly-owned subsidiary of the Anaconda Copper Mining Company (ACM). Its president was Con Kelley, an ACM vice president. International vice president was W.D. Thornton, president of Anaconda subsidiary Greene-Cananea in Mexico; treasurer was Albert H. Melin, who had been secretary-treasurer of Amalgamated; secretary was David B. Hennessy. International directors included B.B. Thayer, who had been Anaconda president until 1915, when he became Anaconda vice president, and John D. Ryan, who had been Amalgamated's president until it dissolved in 1915, when he then took over from Thayer as Anaconda president. International's ore purchasing agent in 1916 was J.B. Whitehill. International owned and operated a copper and lead smelter at Tooele, Utah, and a copper smelter at Miami, Arizona, and it operated the Raritan copper refinery at Perth Amboy, New Jersey, and the smelter of the International Lead Refining Company at East Chicago, Indiana. Over the next fifteen years, International's top corporate officials changed little. In 1920, C.E. Mills, who was general manager of the smelter at Miami, joined International's board of directors, and William Wraith had been named general manager of the Tooele smelter. By 1922, J.O. Elton was general manager of the Tooele smelter. In the early part of this period, International only operated metallurgical facilities. It did not own mines, until 1926.[4] It did, however, begin to own mining companies, such as the Walker Mining Company.

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[2] A.B. Parsons, *The Porphyry Coppers*, (New York: American Institute of Mining Engineers, 1933), 331-332; Marcosson, *Anaconda*, 212-213.

[3] Marcosson, *Anaconda*, 258; *Engineering & Mining Journal* 86 (12 December 1908): 1176; 97 (6 June 1914): 1164; Richter, "The Amalgamated Copper Company," 393; Carrie Johnson, "Electric Power, Copper, and John D. Ryan," *Montana: The Magazine of Western History* 38 (Autumn 1988): 24-37.

[4] Walter Harvey Weed, *The Mines Handbook* (New York: The Stevens Handbook Co., 1916), 625; Weed, *The Mines Handbook* (New York: W.H. Weed, 1920), 88-93; Weed, *The Mines Handbook* (New York: The Mines Handbook Co., 1922), 98-103; Weed, *The Mines Handbook*, 1926 issue (New York: The Mines Handbook Co., 1927), 91-95; Lenox H. Rand and Edward B. Sturgis, *The Mines Handbook* (Suffern, NY: Mines Information Bureau, Inc., 1931), 96.

As described in the next section, International exercised an option in order to purchase controlling interest in the Walker Mining Company in 1918. In other acquisitions of mining property, International purchased all the stock of the Utah Consolidated Mining Company at a foreclosure sale in March 1924 and then incorporated the Utah Delaware Mining Company to become the successor corporation of Utah Consolidated. Utah Consolidated had operated mines in Utah's Tintic mining district before going bankrupt. That same year, International acquired the North Lily Mining Company, which owned properties in the Tintic district. Through the North Lily, International acquired and/or leased several neighboring properties in the Tintic district. During that period, International also gained control of the Park Utah Consolidated Mines Company. In 1926, International purchased the Potosi Lead mine, in Nevada's Yellow Pine district, from the Empire Zinc Company.[5]

The integrated nature of the ACM's corporate structure is nicely illustrated in a two-part series that appeared in *Fortune* in 1936 and 1937. The first article, appearing in December 1937, describes the history and the geographical reach of the company, featuring a two-page map labeled, "The United States of Anaconda." It shows the locations of the metal mines, smelters, refineries, fabricating plants, and support facilities, like a lumber mill and a coal mine, that the ACM and its subsidiaries owned in the U.S., Mexico, and Chile. The map has arrows showing how mines fed copper concentrates to smelters, smelters fed blister copper to refineries, and refineries fed copper to market, to rod and wire mills, and to brass and bronze factories. One of the mines featured on the map was the Walker mine in California, which fed copper concentrates to the International smelter at Tooele, Utah.[6]

The second article in the *Fortune* series describes the ACM's management structure and features a photograph of ACM president Cornelius Kelley and the top ACM executives sitting at a table in the New York corporate headquarters for their weekly meeting. Beneath the photo is an organizational diagram showing the ACM's major subsidiaries and the executives roles in those companies. Kelley was president of the ACM and most of the top tier of subsidiaries, including International Smelting & Refining. Thornton was president of Greene-Cananea. Wraith was vice president of Andes Copper, one of the ACM's Chilean subsidiaries. Another man at the table is Frederick Laist, who was the ACM's chief metallurgist in charge of research operations. *Fortune's* organizational chart for the ACM enterprise shows four International subsidiaries: Walker Mining Company, Utah-Delaware Mining Company, Mountain City Copper Company, and North Lily Mining Company.[7]

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[5] Walter Harvey Weed, *The Mines Handbook* (1916), 625; Weed, *The Mines Handbook* 1920), 88-93; Weed, *The Mines Handbook* (1922), 98-103; Weed, *The Mines Handbook*, 1926 issue (1927), 91-95, 1512-1513, 1521-1523; Rand and Sturgis, *The Mines Handbook* (1931), 96, 1912, 1866-1867, 1878-1879.

[6] "Anaconda: I," *Fortune* 14 (December 1936): 88-89.

[7] "Anaconda: I," *Fortune* 14 (December 1936): 88-89; "Anaconda: II," *Fortune* 15 (January 1937): 76, 143-144.

2. Historical Background of the Walker Mining Company

The Walker Mining Company was incorporated in 1913 under the laws of Arizona. The company located its offices in Salt Lake City, where president Joseph R. Walker resided, and its sole mining property was the Walker mine in Plumas County, California. In August 1916, the International Smelting & Refining Company, a wholly-owned subsidiary of the Anaconda Copper Mining Company, acquired an option to purchase control of the Walker Mining Company. In August 1918, International exercised its option, two months before the option was scheduled to expire, purchasing 630,000 shares of Walker stock (50.4% of total shares issued) at one dollar per share. The key changes to the Walker's management structure were that William Wraith was placed on the board of directors and J.B. Whitehill was named secretary-treasurer of the corporation. Wraith was general manager of International's Tooele smelter and Whitehill was International's ore purchasing agent.[8]

The Walker Mining Company had begun operating the Walker mine in Plumas County, California, in 1916. During the first few years of operation, the company transported ore from the mine shaft to the concentrator, nearly a mile away, by means of an aerial tramway. The original concentrator had a capacity to treat 75 tons of ore daily. Its capacity was quickly expanded, and by 1918 it was treating 200 tons per day. Because the mine and mill were located about twenty miles by road from Portola, to the southeast, the company built, in 1920, an 8.2-mile aerial tramway to haul concentrates from the mill to the Western Pacific Railroad at Spring Garden, southwest of the mine and mill, and to haul supplies from Spring Garden to the mine and mill. Operations at the mine and mill were suspended in October 1920, due to the slump in the copper market. Operations resumed in July 1922, about which time the Walker company began to develop plans for a new mill, based on testing done in the original mill. The new mill, located near the portal to an adit, driven about a mile to the mine workings, began operating in December 1923 with a capacity of 750 tons per day. The 205,903 tons of ore treated in 1924 was more than twice the volume of ore the Walker had treated at its old mill in 1923. Ore treated reached a peak in 1929, in September of which the Walker company doubled the mill's capacity to 1,600 tons per day.[9]

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[8] Walter Harvey Weed, *The Mines Handbook* (New York: The Stevens Handbook Co., 1916), 1202-1203; Weed, *The Mines Handbook* (New York: W.H. Weed, 1918), 608-609.

[9] George Baglin, "Analysis of Facts and History of the Walker Mining Company, Subsidiary of the Anaconda Copper Mining Company," 24 November 1922 (Prosecution Exhibit 50), p 4; Weed, *The Mines Handbook* (New York: W.H. Weed, 1920), 492; Weed, *The Mines Handbook* (New York: The Mines Handbook Co., 1922), 542; Walker Mining Company, "A General Report of Operations of Walker Mining Company Ending April 30, 1923," n.d.; George J. Young, "Anaconda's Walker Mine and Mill," *Engineering and Mining Journal* 117 (3 May 1924): 725; Weed, *The Mines Handbook* (New York: The Mines Handbook Co., 1927), 554-555; Lenox H. Rand and Edward B. Sturgis, *The Mines Handbook* (Suffern, NY: Mines Information Bureau, Inc., 1931), 686-687; M.R. McKenzie and H.K. Lancaster, "Milling Methods at the Concentrator of the Walker Mining Co., Walkermine, California," U.S. Bureau of Mines Information Circular No. 6555, March 1932, pp 2-3.

With the onset of the Great Depression, the market for copper weakened, and the Walker Mining Company operations were intermittent in the 1930s. The longest period of suspended operations was early 1932 to sometime in 1935. Mine and mill closed for several months in some subsequent years, including 1937, 1938, and 1941, when they closed permanently. When it operated, the company continued to extract copper ore from the mine, mostly through the adit, which made contact with the underground workings at the 700-foot level. By 1940, the company had developed the adit about 8,000 feet along a shear zone where the ore bodies were located. There was not a continuous vein along the shear zone, however. Rather, the company encountered five distinct ore bodies, which it called the South, Central, North, 712, and Piute ore bodies. The richest had been the Central ore body, which in the early years had yield ore assaying as high as 4% copper. Other ore bodies yielded material about 1.5% copper. The company developed several shafts and other workings below the 700 level, in an effort to follow ore bodies downward, but in general they did not yield richer ore. They did yield ore in the range of 1.5% copper, which kept the company prospecting for more. Costs of extracting ore above the adit level, of course, was less than the costs of extracting ore from below that level, so the Walker's most profitable operations were in the upper areas of the mine. By 1940, capacity of the Walker mill had been increased to 1,800 tons per day.[10]

I have yet to see primary documents indicating the Walker Mining Company's corporate organization immediately after the ACM, through International, bought controlling interest. Weed reported in the 1916 edition of *The Mines Handbook* that the Walker Mining Company's officials included J.R. Walker, president; G.L. Bemis, vice president; and John F. Cowan, general manager. The 1916 edition did report, however, that the ACM, through International, had acquired an option to purchase shares of Walker stock. The 1918 edition of *The Mines Handbook* (the year International exercised its option) reported that Walker was still president, but now J.B. Whitehill (International's ore purchasing agent) was secretary-treasurer and the ACM's William Wraith was one of the directors on the Walker board. V.A. Hart was Walker's manager. The 1920 edition of *The Mines Handbook* reported that Walker was president, O.M. Kucks (who had become the superintendent of International's Tooele smelter in 1913 and was assistant general manager of International in 1920) was vice president, and Whitehill was secretary-treasurer.[11]

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[10] Walker Mining Company, "Statement 1932," annual report dated March 15, 1933; Walker Mining Company, "Statement 1933," annual report dated March 17, 1934; Walker Mining Company, "Statement 1934," annual report dated March 25, 1935; Walker Mining Company, "Statement 1937," annual report dated March 24, 1938; Walker Mining Company, "Statement 1938," annual report dated March 14, 1939; Walker Mining Company, "Statement 1941," annual report dated April 1, 1942; Walker Mining Company, "Statement 1942," annual report dated March 31, 1943; Clyde E. Weed and Reno Sales, "Report Covering Present Conditions at the Walker Mine," 15 June 1940, p. 1 (Prosecution Exhibit 1, Item 238).

[11] Weed, *The Mines Handbook* (1916), 1202; Weed, *The Mines Handbook* (1918), 608; Weed, *The Mines Handbook* (1920), 492; Weed, *The Mines Handbook* (1922), 100.

Placing V.A. Hart in the position of manager of the Walker Mining Company suggests the ACM taking charge of the Walker's operations. Born in 1876, Vernon Abel Hart was a mining engineer who had graduated from the University of Missouri in 1906. After working as a geologist for the Cananea Consolidated Copper Company (the Mexican operating company owned by Greene-Cananea Copper Company, which was in turn owned by the ACM), he became a geologist and the superintendent of mines for International Smelting in 1915. When Anaconda, through its subsidiary International, took an option on the Walker Mining Company, International put Hart in charge of operations at the Walker mine. Reports on developments at the Walker, prior to International exercising its option, sometimes stated that the Walker was already a subsidiary of International, with Hart in charge of operations.[12] A report in early 1918 stated that the Walker mine was "being operated under bond by International Smelting interests, under the management of V.A. Hart."[13]

After International, on Anaconda's behalf, exercised its option to purchase the Walker Mining Company in 1918, improvements at the Walker mine ensued throughout the 1920s, including the construction of a new mill in 1924 and expansion of the mill's capacity toward the end of the decade. Because I have not seen documents that ARCO may have in its possession describing the exact nature of the management relationship between the Walker mine and the Anaconda/International organization, I must rely on other sources, and those sources suggest that Anaconda/International did indeed manage operations at the Walker mine. The most compelling direct statement is a 1920 report in *The Salt Lake Mining Review*, in which the Walker Mining Company president is cited making a statement about management of the mine. According to the report, "The Anaconda company is under contract with the Walker Copper people to operate the mine for the best interest of the Walker Copper and the management of the property has been entirely satisfactory to the Walker interests, he said."[14]

Although I have not seen a contract between Anaconda and the Walker Mining Company, I can attest that I have seen such contracts in other episodes of U.S. mining history, most notably in the relationship between Newmont Mining Corporation and its subsidiary, Dawn Mining Company. The agreement gave Newmont the means to participate directly in the management of Dawn's operations.[15] Although I have not seen such a management agreement

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[12] John William Leonard, *Who's Who in Engineering* (New York, John W. Leonard Corporation, 1922), 566; *Mining & Scientific Press* 118 (21 October 1916): 613; *The Salt Lake Mining Review* 19 (30 December 1917): 38.

[13] *The Salt Lake Mining Review* 19 (30 March 1918): 39.

[14] *The Salt Lake Mining Review* 22 (30 November 1920): 42. Please note that the quote is of *The Salt Lake Mining Review*, and not a direct quote of J.R. Walker.

[15] I prepared an expert report concerning the management relationship between Newmont and Dawn in *U.S. v. Newmont USA Limited, et al*, the Midnite Mine Superfund case in Washington, and I testified about the relationship at trial in U.S. District Court in Spokane. Under terms of the 1956 agreement between Newmont and Dawn, Newmont was to provide Dawn with "management, technical, and administrative services." Newmont provided Dawn with its on-site

between Anaconda and Walker, the documentary record concerning management of geological and mining activities at the Walker mine is consistent with such an agreement having been in effect during the years of operation at the Walker mine, as the narrative below demonstrates.

Another document that suggests Anaconda's management role in operations at the Walker mine is a 1924 article in *Engineering and Mining Journal*, the leading trade journal of the mining industry in the U.S. Written as the new mill was nearing completion, the article describes both mining methods and operations at the old and new mills. The last paragraph of the article begins with the sentence, "The control of the [Walker] property as a whole is in the hands of the Anaconda Copper Mining Co., through its subsidiary, the International Smelting Co." The article's author then acknowledges the help he received from general manager V.A. Hart as well as superintendents of the property. He also notes that Anaconda's F.C. Torkelson superintended construction of the mill, and International's Julius Kurtz installed the electrical equipment at the mill.[16] Such a practice was observed by Newmont in the case of its subsidiary's operation's at the Midnite mine as well. For day-to-day operations, like supervising the mine and the mill, Newmont would provide its subsidiary with a full-time manager, but for special activities, like construction, Newmont's managers took charge.

The earliest primary document I've seen showing the ACM's presence in the Walker corporate hierarchy is the company's 1923 annual report, which shows that J.O. Elton was vice president and Whitehill was secretary-treasure, and both men were on the board of directors. James Orr Elton was an ACM metallurgical engineer who had worked in the testing department of the Washoe Reduction Works at Anaconda, for the Anaconda Smelter Smoke Commission during the 1910s studying impacts of smelter smoke on the environment (the Commission grew out of an agreement between the ACM and the U.S. government in response to a suit the U.S. had brought against the ACM), and as assistant superintendent of the ACM's Great Falls smelter, before moving to Salt Lake City in 1922 to work for International as general manager of the Tooele smelter. In addition to his work for International, he served in later years as an official of several International subsidiaries: president of the North Lily Mining Company, manager of the Utah-Delaware Mining Company, director of Park Utah Consolidated Mines Company, and vice president and director of Walker. The Walker's annual reports in 1924 (the year the new mill went into operation), 1925, and 1926 showed that the ACM's William Wraith was again a vice president (along with Elton) and that Wraith was a director on an expanded board of directors. The 1927 annual report shows that Robert E. Dwyer had replaced Wraith as director and vice president. Dwyer had become an ACM vice president in 1926.[17]

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resident manager and, from time to time, other top operations officials.

[16] George J. Young, "Anaconda's Walker Mine and Mill," *Engineering and Mining Journal* 117 (3 May 1924): 730. The mill superintendent, by the way, was Walter C. Page, who had graduated from the Colorado School of Mines in 1915 and went from the Walker mill (and a brief stint at the Hardinge; see *Mining and Engineering World* 42 (5 June 1915): 1041, *Mining and Metallurgy* (June 1922): 46, and *Engineering and Mining Journal* 122 (23 October 1926): 670.

[17] "Memorandum of Services of Messrs. Elton, Kellogg and Welch (H.V.), with the Anaconda

In my work as an expert witness in matters for which I was asked to develop opinions concerning management relationships between parent corporations and their subsidiaries, I have seen that the office of vice president of a subsidiary is often key in giving the parent a conduit for directing the subsidiary's manager of operations, a conduit for doing so within corporate norms that separate the parent from liabilities of the subsidiary. Such an officer will have a top management position with the parent, such as Elton had at International, having charge of operations for the parent's broad enterprise. This gives an official such as Elton access to all of the top experts in the parent's corporate hierarchy. At the same time, an official like Elton will serve as an officer with one or more subsidiaries, having executive charge of operations for each of those subsidiaries. A mining company's top operating official at the mine, mill, or smelter usually had a title like manager or general manager. He would typically report to the corporate officer in charge of operations. In the 1920s at Walker, Hart was the manager, and he reported to Elton, Walker's vice president, who also served as International's general manager. As long as Elton was wearing the hat of Walker vice president while directing Hart, he was observing the rituals of corporate separation that protected the parent from the liabilities of its subsidiary.[18]

The original Walker officials and minority stockholders were happy to receive such management expertise from the ACM. In a November 1922 interview, Walker president J.R. Walker said, "I believe that the minority stockholders should be congratulated in having a highly efficient organization like the Anaconda Mining company [sic] in charge of development and

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Commission," unpublished, undated memo, Box 84b, General Files Prior to 1954, Record Group 70, Records of the U.S. Bureau of Mines, National Archives, College Park, MD; Weed, *The Mines Handbook* (1920), 492, 961; Weed, *The Mines Handbook* (1922), 100; Walker Mining Company, "A General Report of Operations of Walker Mining Company Ending April 30, 1923," n.d.; Walker Mining Company, "Report of Operations of Walker Mining Company for the Year Ending July 31, 1924," report dated 12 September 1924; Walker Mining Company, "Report of Operations of Walker Mining Company for the Year Ending July 31, 1925," report dated 18 September 1925; Walker Mining Company, "Report of Operations of Walker Mining Company for the Year Ending December 31, 1926," report dated 31 March 1927; Marcosson, *Anaconda*, 161; "Highest Honor in Metal Field Given to S.L. Man," (Salt Lake City) *Deseret News*, 8 February 1933.

[18] I had opportunity in *Pinal Creek Group v. Newmont Mining Corporation, et al*, to observe the importance of the vice president in directing the operations of Inspiration. ACM officials with expertise in geology, mining engineering, metallurgy, and construction were able provide technical advice to Inspiration's vice president, who was also an official in the broader ACM enterprise. When I testified at trial in *U.S. v. Newmont Mining Corporation, et al*, the Midnite mine Superfund case tried in federal court in Spokane, I explained a similar system by which Newmont managed the operations of its several subsidiaries. For example, Marcus D. Banghart was Newmont's vice president of operations in the 1950s and 1960s. He also served a vice president of the Dawn Mining Company (which operated the Midnite mine) and other Newmont subsidiaries. Wearing the hat of v.p. for each of those subsidiaries, he was able to direct their on-site managers. When Newmont ran afoul of those corporate norms, it was when other Newmont officials, who had no title in the Dawn corporation, gave direction to Dawn operations.

exploitation of the property. The conduct of the affairs of the Walker Mining company [sic] by the Anaconda company has always been for the best interests of all the stockholders." [19]

3. The Historical Context for Understanding Twentieth-Century Management of Large-Scale Mining Enterprises

In order to understand how the Walker Mining Company was managed historically, and how its management fitted within the larger ACM system, it is important to review mine management hierarchies during the first half of the twentieth century. Such organizational structures were described in standard texts of the mining industry.[20] Management methods in the mining industry match those described by Alfred D. Chandler, the foremost historian of American business corporations, who has described the evolution of management methods in American industry generally. As was typical of corporations in the United States of the twentieth century, stockholders owned shares in a mining company, and large mining companies often had hundreds if not thousands of stockholders. Representing the stockholders in the management of the corporation was the board of directors. In the words of J.R. Finlay, who wrote the chapter on mine organization for Peele's *Mining Engineers' Handbook*, "In large corporations the management comes to lie in a practically self-perpetuating committee of stockholders, called the 'Board of Directors.'" [21] Typically, directors of large mining corporations were composed partially of individuals representing institutions of finance and investment and partially of individuals expert in mining, metallurgy, and allied fields. The president of the corporation was the chief executive officer of the corporation. Large mining corporations also had vice presidents who were the executive heads of major departments. The chief operating officer was usually called the general manager. He was appointed by the president and board of directors. The superintendent of each of the operating departments (mining, milling, smelting, geology, mechanical and electrical engineering, accounting) reported to the general manager.[22]

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[19] Baglin, "Analysis of Facts and History of the Walker Mining Company," 3.

[20] George J. Young, *Elements of Mining* (New York: McGraw-Hill Book Company, Inc., 1916), chapter on "Mine Organization and Operation," 507-540; Young, *Elements of Mining* (New York: McGraw-Hill Bood Company, Inc., 1946), chapter on "Mine Organization and Operation," 625-658; Robert Peele, *Mining Engineers' Handbook* (New York: John Wiley & Sons, Inc., 1918), chapter on "Mine Organization and Accounts," 1268-1281; Peele, *Mining Engineers' Handbook* (New York: John Wiley & Sons, Inc., 1941), section 20 on "Mine Organization and Accounts," 2-12. Note that there was little change in the organization of a mining enterprise as described by Young and Peele in their volumes from the 1910s and their volumes from the 1940s.

[21] Peele, *Mining Engineers' Handbook* (1918), 1268; Peele, *Mining Engineers' Handbook* (1941), 20-02.

[22] Peele, *Mining Engineers' Handbook* (1918), 1268-1269; Young, *Elements of Mining* (1916), 509-510.

Beneath the general manager and his superintendents or department heads were foremen, shift bosses, and the workers who did the actual physical labor, like miners, muckers, trammers, mill men, and shop workers. An important part of the management structure was the system of daily, weekly, and monthly reports that foremen prepared for superintendents, superintendents prepared for the general manager, and the general manager prepared for the executives and directors. These reports allowed management to monitor grade of ore being worked, percentage of metal being recovered, costs being incurred, and work being accomplished. It was the responsibility of management to direct the operations, back down through the hierarchy, to ensure that output was maximized and costs minimized. George Young wrote:

> In the operation of a mine, labor, power, materials and mechanical appliances are brought together to accomplish a specific end, the winning of ore or mineral, its treatment and the marketing of the products. Profit is the dominating motive. Stockholders put their money into an enterprise in order to make more money. The success of the business is measured by the dividends returned. In order to pay dividends the income must be greater than the outgo. Income is controlled by the grade of the ore, the percentage extracted and the selling price of the product. Outgo is controlled by good management. Good management means the close control of expenditures, efficient working and the coordination of all the parts which go to make up the whole. A comprehensive plan, a well-designed plant and the careful selection of staff men, foremen and workers is essential.[23]

The Walker Mining Company abided by these principles of sound management, but it is important to understand that it did so as part of the larger, tightly-managed ACM system. Nature, of course, controlled the grade of the ore, but to the extent that the Walker ore body could be controlled by understanding it, the Walker Mining Company depended during its operating years upon services of the ACM, particularly its geology department, headed by Reno Sales, and its top mining engineer, William B. Daly (and later Clyde E. Weed). Walker's milling cost reports were circulated to the ACM's top metallurgist, Frederick Laist, to ensure that operations were being conducted as effectively as possible. A key Walker executive position was filled by J.O. Elton, a top manager in the ACM/International organization who ensured the efficient coordination of all the parts comprising the Walker whole, but Elton was free of operating biases toward the Walker mine, relative to the overall ACM/International system. From documents I have reviewed, it is apparent that the ACM monitored and controlled the geological, mining, and metallurgical facets of the Walker management structure that made the Walker mine as efficient and profitable as it was.

All the evidence (and I have reviewed a considerable volume of evidence concerning the ACM's oversight of the Walker's geological and mining operations, evidence assembled by the Water Board from the corporate records of the ACM held at the University of Wyoming and the Montana Historical Society) creates a clear and powerful pattern showing that the ACM had established an extensive, geographically-diverse but tightly-managed, corporate structure, that

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[23] Young, *Elements of Mining* (1916), 510; Young, *Elements of Mining* (1946), 628.

the Walker Mining Company was part of the ACM structure, that the ACM controlled Walker, and that by means of such control the ACM managed the Walker's operations, including operations at the mine.

To appreciate the ACM's corporate structure and to distinguish it from a structure in which the Walker Mining Company would be a corporate entity with its own managers who were answerable solely to the Walker's executives and board of directors, I will lay out two models for organizing a mining operation. The first is what I call the traditional corporate hierarchy for a mining operation. Such an organization is described by George J. Young in his classic text, *Elements of Mining*. After a prospect has been proved worthy of large-scale investment and development, a corporation takes ownership of the right to mine the property and takes charge of the mining operation. The organizational structure for the operation resembles an hour glass, with the general manager at the narrow neck of the hour glass. Expanding above the focal point of the general manager, the hour glass broadens to the president and the other officers of the corporation. Above them, the hour glass broadens to the board of directors and then broadens again to all of the stockholders. Below the general manager, the organizational hour glass broadens to the professionals in charge of various facets of the operation including mining engineer, geologist, metallurgist, and accountant. The professional specialists supervise various foremen and shift bosses, who in turn supervise the workers who perform the vast bulk of the jobs necessary to a mining operation, including miners, powdermen, equipment operators, mill hands, shop workers, and bookkeepers. About the general manager, Young writes:

> The chief operating official is the general manager, or as he is sometimes called, the managing director, general superintendent, or superintendent [this person at Walker mine was called the manager]. He is selected by the president and board of directors. Whether the mine is small or large the individual selected for the direct charge of the property must have technical knowledge, experience, and must have shown ability to manage men. Personality and character are not overlooked. Good management is one of the first requisites toward the success of a mining enterprise, and a man who has a successful record inspires confidence in the minds of the stockholders and directors. Tact, a keen business sense, and balanced judgment are essential factors in the success of a manager.
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> The general manager selects his own staff of technical assistants. As the members of the staff are directly responsible to the manager, it is desirable that they owe their appointments to him. The staff of a large mine consists of a mining engineer, geologist, metallurgist, mine surveyor, assayer, mechanical and electrical engineer, accountant, and very often a physician. The members of the staff are directly in charge of the separate departments or divisions of the work.[24]

[24] George J. Young, *Elements of Mining* (New York: McGraw-Hill Book Company, Inc., 1916), 509-510. An almost identical text appears in the fourth edition of Young's *Elements of Mining* (1946), 626-627.

Such an organizational structure is evident in many of the nineteenth-century mining companies I have studied, including the Boston & Montana Consolidated Copper & Silver Mining Company (B&M) in Butte, and the Standard Mining Company in Bodie, California.[25] In each case, the general manager was hired by and accountable to the company's president and board of directors. When the manager needed the services of a specialist mining engineer, geologist, or metallurgist, he hired the expert, who then reported findings or made recommendations to the manager. Based on the findings or recommendations, the manager decided the course of action to take and was accountable to the president and board of directors for his decisions.

A different model began to emerge around the turn of the twentieth century as mines in various localities were consolidated under one or more dominant corporate umbrellas and as those corporations began to seek mines in other locations. An excellent example of this new model is the Anaconda Copper Mining Company (ACM), which began in the late nineteenth century as an exemplar of the traditional model of a company, with a single group of mines at Butte, Montana. The ACM was the largest of several Butte mining companies, including the B&M, which were acquired at the turn of the century by a giant holding company, the Amalgamated Copper Company. Although each of the Amalgamated companies continued to exist as a distinct corporate entity and to manage its own set of mines, mills, and smelter, Amalgamated almost immediately put a mining engineer, John Gillie, in charge of coordinating developments at the several Butte operations. In 1910, Amalgamated caused each of its subsidiary Butte companies to transfer its property and operations to the ACM, and in 1915 Amalgamated ceased to exist as a holding company, leaving the ACM as its successor. During that same period, John D. Ryan, Cornelius Kelley, and other top ACM/Amalgamated officials began acquiring mining and metallurgical properties elsewhere in the U.S. as well as in Mexico and Chile. To manage its far-flung operations and continue to develop new ones, the ACM went through an evolution of management structures, eventually settling on one described in the two-part article that appeared in *Fortune* in the mid-1930s. In addition to officers of the ACM itself, the enterprise's core group of managers included W.D. Thornton and William Wraith, who served as president and vice president, respectively, of several the ACM's wholly-owned, majority-owned, and non-majority owned subsidiaries. Other top managers included William B. Daly (and later Clyde E. Weed), Reno Sales, and Frederick Laist, who had charge of mining operations, geology, and metallurgical operations, respectively, throughout the enterprise.[26]

In my work as an expert witness, testifying in Superfund litigation, I have encountered other instances as well in which a global mining enterprise created a management system in

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[25] Quivik, "Captain Couch of the Boston & Montana: A Self-Trained Mining Engineer and the Industrialization of Butte's Copper Mining District," unpublished paper presented at the annual meeting of the Western History Association, Denver, CO, October 1995; "Gold & Tailings: The Standard Mill at Bodie, California," in *IA: The Journal of the Society for Industrial Archeology* vol. 29, no. 2 (2003): 5-27.

[26] "Anaconda I," *Fortune* 14 (December 1936): 88-89; "Anaconda II," *Fortune* 15 (January 1937): 76; Marcosson, *Anaconda*, 110, 259-261.

which the parent corporation's top officials could manage the operations of its several subsidiary corporations, even while the subsidiaries' local operations were managed by individuals wearing appropriate local subsidiary hats. A notable example of this management structure was that of the Newmont Mining Corporation, about which I testified in *U.S. v. Newmont, et al*, the Midnite mine Superfund case in the State of Washington. Newmont did not fit the traditional model of a mining enterprise; it was not a corporation that grew up around a mining operation at a single location. Rather, Newmont fit the model exemplified by the mature Anaconda. The two corporate histories, of course, were not identical. Anaconda emerged as a global corporation from a company that had operated a group of mines at a single place, Butte. Newmont on the other hand was created by W.B. Thompson to promote mining investments at a variety of locations. Despite the different origins, Newmont and the ACM evolved to have similar organizational structures for managing their respective arrays of mining properties. Each corporation owned a number of subsidiaries, some wholly-owned and some not. Each corporation had a group of corporate officials and top managers who were responsible not for one subsidiary but for one facet of operations, such as exploration, metallurgy, or operations, at several subsidiaries. And it was in this latter facet of their organizational structures that both Newmont and the ACM diverged from the traditional model.[27]

A key feature in the way Newmont's management structure diverged from the traditional structure was evident in the relationships local managers of the various subsidiaries maintained with other corporate officials and employees. In the case of the Midnite mine operation, the president of Dawn and Dawn's board of directors did not find and hire a resident manager. Rather, the Newmont hierarchy selected a manager from within the Newmont community, and then the Dawn directors ratified the Newmont appointment. If the Dawn operation faced a major problem, the resident manager did not turn to his subordinates to help decide on a solution (although he certainly received valuable ideas and suggestions from them), nor did he hire outside experts in mining engineering, geology, or metallurgy, who would be accountable to him, and then, with their advice, make decisions for which he was accountable to Dawn's president and board. Rather, Dawn's manager remained a Newmont employee and part of the Newmont organizational structure. As part of the Newmont structure, he took direction from top managers at Newmont who were responsible for mining, geology, and metallurgy throughout the Newmont enterprise. And if the Dawn operation faced a major problem, the resident manager turned to his Newmont superiors for advice and direction.

U.S. v. Newmont was tried in federal court in Spokane in July 2008. I testified at trial about the various means through which Newmont managed the operations of the Dawn Mining Company, the Newmont subsidiary that operated the Midnite mine. The judge ruled that Newmont did indeed manage Dawn's operations and was therefore liable as an operator for response costs in the Superfund cleanup. The judge cited my testimony frequently in his ruling.

This arrangement, of top officials and managers of the parent directing staff and operations of the subsidiary, which was also the practice at the Walker mine, was not unusual in the development of American corporate management systems in the early twentieth century. The

[27] Fredric L. Quivik, "Expert Report," in *U.S. v. Newmont USA Ltd, et al*, 7 November 2006.

renowned historian of American business, Alfred D. Chandler, describes the evolution in his classic work, *The Visible Hand.* In the early twentieth century, even as American elected officials, judges, and government bureaucrats were debating whether and how to place limits on the extent to which corporations could consolidate (for example, the Clayton Act and the Federal Trade Commission Act were enacted in 1914), managers of large corporations were devising ever more effective means of control over enterprises that were increasing in scale, geographical breadth, and complexity. Chandler has called this change "The Managerial Revolution in American Business."[28] Through the process of mergers that characterized much of late-nineteenth- and early-twentieth-century American business history, a new corporate form came into being that Chandler calls "the managerial enterprise." His opening paragraphs of a chapter describing top management in the managerial enterprise are worth quoting at length, because they describe the early twentieth-century transition in management leading to the model adopted by the ACM to administer its geographically-dispersed operations.

> The practices and procedures of modern top management had their beginnings in the industrial enterprises formed by merger rather than those that built extended marketing and purchasing organizations. The process of merger brought more persons, with more varied backgrounds, into top management. In the new consolidations a family or single group of associates rarely held all the voting stock. It was scattered among the owners of the constituent companies and the financiers and promoters who had assisted in the merger. It became even more widely held after the company sold stock to finance the reorganization and consolidation of facilities. After merger the initial administrative problems were more complex than those in the companies that grew by internal expansion. The facilities of the constituent companies had to be reshaped and their administration centralized. Moreover, a merger, the reorganization that followed it, and then the carrying out of the process of vertical integration all required continued planning.
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> The shift in strategy from horizontal combination to vertical integration first brought the managerial enterprise to American industry. In the terminology of this study a managerial firm differs from an entrepreneurial one in that full-time salaried executives dominate top as well as middle management. The owners no longer administer the enterprise. The experienced manufacturers, who helped to carry the merger and who, normally with the advice of one or two financiers, rationalized the facilities of a new consolidation, became the core of its top management. Although they were still large stockholders, they rarely controlled the company as did the owners of entrepreneurial firms. Moreover, they hired and promoted managers with little or no stock ownership in the company to head the new functional departments and the central office staff.

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[28] The phrase is the sub-title of Alfred D. Chandler's prize-winning book, *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, MA: Harvard University Press), 1977.

> In carrying out the reorganization after the merger, these top managers began to define their specific tasks. The centralizing of administration caused them to institute uniform accounting and statistical controls. In hiring and allocating managerial personnel they began to think more systematically about evaluating managerial performance. And because the reorganization of production and the building of a sales and buying network created numerous and often conflicting claims for capital expenditure, these senior executives were increasingly forced to pay close attention to the systematic long-term allocation of capital and personnel. The methods fashioned during the process of consolidation and integration--sometimes the process took years--were further refined as the company began to grow and to compete oligopolistically with other large integrated enterprises.[29]

In applying Chandler's description of the managerial revolution to the mining industry, one may substitute "experienced mining engineers, geologists, and metallurgists" for "experienced manufacturers."

As the ACM acquired more properties and absorbed some of the talent associated with those properties into the corporate hierarchy, one challenge to decision-making would be to avoid conflict arising from loyalties to the various locales being exercised by the various managers. The ACM eventually adopted an organizational model to surmount the challenge that was pioneered, according to Chandler, by General Motors. As the 1920s unfolded, General Motors perfected a system for managing several autonomous but integrated divisions. General Motors' central executive committee had on its staff specialists with expertise in each of the functions, like sales or manufacturing, performed by the several divisions. The central staff specialists therefore reviewed all of the reports and procedures of each division's sales managers, manufacturing managers, etc. Chandler describes other techniques developed at General Motors as well to enhance the management of a large, complex enterprise featuring several operational divisions, each with parallel and nearly identical functions.

> By these several techniques top management was able to free itself of operating biases and responsibilities, and at the same time keep in touch with the corporation's widespread operations. Policy and planning were no longer made through negotiations between the senior managers of powerful operating departments or divisions. Policy was formulated by general executives who had the time, information, and psychological commitment to the enterprise as a whole, rather than to one of its parts.[30]

This characterizes the top corporate officials, executives, and managers of the ACM enterprise very well. They were committed to the ACM enterprise as a whole; they wanted each of the ACM's ventures to prosper, both to feed profits and dividends to the ACM balance sheet and to provide the ACM's engineers and managers with engineering and management challenges that

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[29] Chandler, *The Visible Hand*, 415-416.

[30] Chandler, *The Visible Hand*, 462-463.

they could surmount, and then carry their experiences and successes to other ventures, each with its own set of challenges and each, hopefully, contributing profits to the ACM's coffers and to the ACM's stockholders.

B. HISTORICAL DETAILS IN THE ACM's MANAGEMENT OF THE WALKER MINING COMPANY'S OPERATIONS

In order to understand the various roles in managing a mining operation, it is important to appreciate the several facets involved in extracting ore from the ground, processing the ore to make it ready for transportation and smelting, and then smelting and refining the ore to produce pure metal (in this case copper) for the market. Some mining companies only extract ore, relying on others to mill and smelt their ore. Other companies, as the Anaconda Company Mining Company was, are fully integrated and possess the technical and management capabilities to mine, mill, and smelt ore. The International Smelting & Refining Company, as its name suggests, originally specialized in smelting and refining materials produced by others, but in time International developed its own mining and milling operations as well. The Walker Mining Company mined and milled its own ore but did not smelt it.

Mining, in turn, consists of several facets in addition to the production of ore from sub-surface deposits. Exploration entails the systematic search for ore, either by opening the ground with trenches, shafts, or adits, or by drilling. When ore is found, the next step, before production of ore can commence, is development, which entails the systematic excavation of underground workings so designed to allow for efficient extraction of ore. Only when ore is extracted from a mine can the mining operation yield revenue. Occasionally, underground workings can be developed in ore, so the mine can yield some revenue. Often, however, development work is conducted in rock that is above, below, or adjacent to the ore body and is rock that has no value. Such development work is a cost to the mining company, but it yields no revenue and is therefore called "dead work." Mining companies try to keep dead work to a minimum, yet they must always undertake sufficient development of new underground workings, opening new portions of the ore body, for the mine to keep producing. Moreover, the development work—the shafts, crosscuts, and drifts that give miners access to underground bodies of ore—should be well-designed to allow for the efficient conveyance of ore to the surface, where it can be further processed.[31]

Had the Walker Mining Company been an independent enterprise with a conventional management structure for the Walker mine, as out lined by Young, a geologist and a mining engineer, hired by and responsible to the manager, would have had charge of prospecting for extensions of the veins and of developing underground workings to access the ore.[32] Because the Walker Mining Company was integrated into the management structure of the Anaconda Copper Mining Company, however, exploration and development were directed not by the manager of

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[31] Young, *Elements of Mining*, 394-402.

[32] Young, *Elements of Mining*, 509-513.

the Walker mine but rather, as the following narrative will show, by high-ranking specialists in the Anaconda organization, including high-ranking officials in the International organization in Salt Lake City, who had no positions with the Walker Mining Company.

Documents I have reviewed for this matter show that the Walker Mining Company did have a local manager, but that decisions about exploration and development—decisions about whether and how to explore for new ore and how to develop the underground workings to yield both an effective operation and enhance the likelihood of finding new ore bodies—were made by Anaconda/International officials. The Anaconda/International geologists and mining engineers in Butte and Salt Lake City who directed exploration and development at the Walker mine coordinated with the local manager, to be sure, because it would be miners and foremen working under the manager's direction who would implement the development work. Moreover, the local Walker geologists, although on the Walker payroll while at the mine, did not answer to the Walker manager but rather to the geologists in the Anaconda/International organization. The documents show numerous occasions in which ACM or International managers, who had no official positions within the Walker organization, gave direction directly to the local Walker staff, bypassing the Walker manager.

In sum, documents suggest that, as the management relationship between the ACM and Walker evolved, the geologist and engineer at the Walker mine, who would normally have reported to the Walker's general manager, reported instead to International's chief geologist and International's manager of mines. The narrative below describes this evolving management structure by narrating episodes in the history of operations at the Walker mine that show how the ACM managed operations there.

For example, in 1922, in preparation for construction of the new mill at the Walker mine, Walker manager V.A. Hart did not contract with a metallurgical consultant to help plan and design the mill. Rather, the ACM sent Bernard Morrow, superintendent of concentration at the Washoe Reduction Works, to California to analyze the current Walker mill. Morrow circulated his report among the ACM hierarchy, and top officials like Frederick Laist and William Wraith conferred before recommending to Elton the developments that the Walker should implement in building a new mill.[33]

Similarly, the ACM's top geologist, Reno Sales, had sent ACM geologists to California in 1923 to recommend development work that Walker manager Hart should undertake. For example, at the 600 level, Hart was to develop a straight drift that was roughly parallel to the vein, which exhibited fluctuations. Crews would then develop crosscuts to the vein every one hundred feet. Rather than driving a straight drift, however, Hart had had his crews try to follow the richest part of the vein, resulting in a very crooked drift that would not be effective for production and further development. Sales was frustrated that Hart was not following

[33] Bernard S. Morrow, "Inspection of the Walker Mining Company's Concentrating Plant Located Near Spring Garden, Plumas County, California," unpublished report dated August 1922 (Prosecution Exhibit 1, Item 5); William Wraith to Frederick Laist, letter dated 31 August 1922 (Prosecution Exhibit 1, Item 6).

instructions. Sales wanted to establish lines of communications so that his office could direct Hart's development of the Walker mine without having to go through Elton.[34]

Evidently such a process was established; in October 1923, Paul Billingsley, an ACM/International geologist, wrote Hart summarizing the decisions that had been made at a meeting the previous day concerning development work that would be undertaken at the Walker mine. Writing on behalf of International, Billingsley closed by stating that Hart should consider the letter authorization to begin the work. I have seen nothing to suggest that Billingsley wore a Walker hat, and he did not indicate to Hart that he was writing as a Walker official.[35] More than a decade later, Sales was corresponding with and giving direction to the Walker geologist in California, and the geologist was reporting directly on his work to Sales.[36] Such a pattern of local geologists working under the direction of Sales and others in the Anaconda/International organization, and without Walker titles, obtained from 1923 until the mine closed in 1941.

In September 1923, Billingsley had sent Elton the six recommendations that ACM geologist M.H. Gidel had made earlier in the month concerning development work to be undertaken in the Walker mine. In his cover letter to Gidel's recommendations, Billingsley informed Elton which of them he thought the Walker company should follow and which were unnecessary. At the bottom of each recommendation is the line, "Recommended by M.H. Gidel." At the bottom of the recommendations Billingsley approved is the line, "Approved by Paul Billingsley." Even though Billingsley was writing to Elton about work to be undertaken by the Walker Mining Company, Billingsley did not address Elton as a Walker official but rather as manager of International Smelting.[37]

People at the Walker Mining Company would correspond directly with top ACM officials, rather than communicating through Elton. For example, in early 1922, F.C. Torkelson wrote a letter directly to Frederick Laist describing conditions at the Walker mine and mill and

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[34] Paul Billingsley to J.O. Elton, letter dated 14 September 1923 (Prosecution Exhibit 1, Item 14); Reno Sales to Billingsley, letter dated 20 September 1923, (Prosecution Exhibit 1, Item 15).

[35] Billingsley to V.A. Hart, letter dated 12 October 1923 (Prosecution Exhibit 1, Item 16). After completing BS & MS degrees at Columbia University in 1908 and 1910, respectively, Paul Billingsley moved to Butte to work for the Anaconda Copper Mining Company. The ACM transferred him to its subsidiary, International Smelting in Salt Lake City, where he worked to find and develop ore for the International smelter at Tooele; see M.S. Hedley, "Memorial to Paul Billingsley," *Geological Society of America Bulletin* 75 (September 1964): 133-134.

[36] Sales to Seth K. Droubay, letter dated 27 October 1937 (Prosecution Exhibit 1, Item 119); Droubay to Sales, letter dated 1 November 1937 (Prosecution Exhibit 1, Item 120).

[37] Billingsley to Elton, letter dated 14 September 1923 (Prosecution Exhibit 1, Item 14); Recommendations for Development, nos. 1-6 (Prosecution Exhibit 1, Item 14).

the recommendations that he, Torkelson, had made to Elton and Hart for improvements.[38] As noted above, Torkelson was an Anaconda engineer, sent to the Walker mine to oversee construction of the new mill.

1. Management of Mining Operations at the Walker Mine

V.A. Hart served as manager of the Walker mine until early 1924, when he was replaced by I.L. Greninger, who served until the end of the year. Greninger had worked at the Inspiration Consolidated Copper Company's flotation mill in Arizona. In January 1925, Herbert R. Tunnell was named manager of the Walker Mining Company's operations. He had been foreman of the ACM's Pennsylvania mine in Butte prior to taking the position at the Walker mine.[39] During his tenure as manager at the Walker mine, Tunnell reported to and took direction from a number of people in the Anaconda/International organization who had no positions with the Walker Mining Company. Regarding exploration and development, that direction was typically funneled through Tom Lyon, International's chief geologist. Lyon had graduated from the Montana School of Mines in Butte in 1916 and went to work as a junior geologist for the ACM. In 1922, the ACM transferred him to work as a geologist for International in Salt Lake City. He became International's chief geologist in 1926.[40] I have seen no evidence of Lyon ever having a title with the Walker Mining Company.

As outlined above, had the Walker Mining Company been managing its own operations, Tunnell, as the manager of operations, would have reported directly to the Walker officers and board of directors. Had he need of geological or mining engineering expertise, he would have hired a geologist or mining engineer, who would have reported to him. Together with his expert subordinates, he would have made decisions about exploration and development, for which he would have been answerable to the Walker officers and board of directors. Instead, as the correspondence shows, Tunnell took direction from geologists and mining experts in the Anaconda/International organization who had no Walker titles. The chain of command for managing operations, from the Anaconda Copper Mining Company, down through International, to the Walker Mining Company, was evident in the second half of 1925, when a number of new developments in the mine workings, including drifts and crosscuts as well as vertical connections between levels, had to be determined.

The episode featured visits to the Walker mine by Reno Sales, the ACM's chief geologist, William B. Daly, the ACM's manager of mines, and Tom Lyon, International's chief geologist. And decisions that were made involved direction from B.B. Thayer, ACM vice president, and William Wraith, a top ACM official with positions as officer and/or director of

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[38] F.C. Torkelson to Frederick Laist, letter dated 4 November 1922 (Prosecution Exhibit 1, Item 7).

[39] *The Anode* 1 (April 1915): 3.

[40] "Lyon Pulls Out," *The Kansas City Star*, 24 June 1953.

several ACM subsidiaries, including the Walker Mining Company, for which he was then serving as director and vice president. When Tunnell wrote Wraith, reporting on the developments that were underway, he copied Thayer, Elton, and Lyon.[41] Among the decisions were the location and sequencing of the excavation of winzes and/or raises linking levels of mine workings. The correspondence shows that Tunnell awaited approval from Lyon before proceeding with development work: "Regarding the proposed shaft and winze, I believe we should do the preliminary work at once and as you approve the locations suggested in my letter we will get the hoists installed as soon as possible."[42] On August 28, Lyon wrote Tunnell, "By this time you have had my letter of August 25th regarding the development work proposed by you. I think that letter will give you the authority to proceed with the winzes as you are able." [43]

Such authorization of work by Lyon continued into the fall and winter. At the end of September, Lyon wrote Tunnell, "Mr. Billingsley is now back and will visit the Walker mine next week and will take up the matter of development work at that time. During the interval you are authorized to drift north and south on the ore disclosed by crosscut 647 S. Crosscutting will be recommended by Mr. Billingsley." [44] In early February 1926, Tunnell wrote Paul Billingsley, "The following work is being done with the approval of Mr. Wm. B. Daly," and he went on to describe drifting Walker crews were doing. [45] Reference to Daly concerned his recent trip to the Walker mine. After Daly returned to Butte, he discussed conditions at the Walker mine with Reno Sales, and the two developed plans for further exploration, which Daly then proposed in writing to Con Kelley. In a letter to Billingsley, Sales reported that Kelley had approved the exploration plans. Sales also instructed Billingsley how to communicate findings and recommendations from a pending trip Billingsley was to take to the mine; he was to write Sales and Daly in Butte, rather than sending copies of his reporting to the ACM's New York office. Then Daly would forward Billingsley's letter to Kelley, along with comments. [46]

Likewise, Paul Billingsley was approving exploration and development work being undertaken at the Walker mine, and he was doing so in part based on direction from Butte. In 1926, exploratory drilling and a new crosscut at the 600 level were underway. Tunnell kept

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[41] Report of the Walker Mining Company for the Year Ending July 31, 1925; Report of the Walker Mining Company for the Year Ending December 31, 1926; Sales to B.B. Thayer, letter dated 20 July 1925 (Prosecution Exhibit 1, Item 34); H.R. Tunnell to William Wraith, letter dated 19 August 1925 (Prosecution Exhibit 1, Item 37); Tom Lyon to William Wraith, letter dated 20 August 1925 (Prosecution Exhibit 1, Item 38); H.R. Tunnell to Tom Lyon, letter dated 25 August 1925 (Prosecution Exhibit 1, Item 39).

[42] Tunnell to Lyon, letter dated 27 August 1925 (Prosecution Exhibit 1, Item 40).

[43] Lyon to Tunnell, letter dated 28 August 1925 (Prosecution Exhibit 1, Item 41).

[44] Lyon to Tunnell, letter dated 29 September 1925 (Prosecution Exhibit 1, Item 44).

[45] Tunnell to Billingsley, letter dated 4 February 1926 (Prosecution Exhibit 1, Item 52).

[46] Sales to Billingsley, letter dated 9 February 1926 (Prosecution Exhibit 1, Item 53).

Billingsley and others apprised of progress, indicating that he would continue drilling "hole D" until he received instruction from Billingsley to cease. When the hole had reached a depth of almost 500 feet, Billingsley instructed Tunnell to cease, but Tunnell had just learned that William B. Daly, the ACM's mines manager in Butte, wanted the hole extended to 1,000 feet. When the hole exceeded 1,400 feet, Daly told Tunnell that drilling could cease, subject to Billingsley's approval, which the latter provided on June 1. Regarding the crosscut, Tunnell wrote Billingsley that he was ready to commence, subject to Billingsley's approval, and Billingsley responded with approval of the plan.[47]

The overall plan for exploration, development, and mining at the Walker mine was being overseen by the ACM's top officials, as is evident in a February 1926 letter from Sales to Billingsley. William Daly had visited the Walker mine in early 1926. While there, he approved development of a drift along the vein that would be parallel to the main adit and that would be connected to the main adit by crosscuts at 100-foot intervals. After Daly returned to Butte, he met with Reno Sales, and the two agreed on a plan for the Walker. Based on that meeting, they developed a set of recommendations for exploration and development at the Walker, which Daly sent to Con Kelley in writing. Kelley authorized the work.[48]

A 1927 letter from A.D. Hunter of the Accounting Department in Salt Lake City to new Walker manager H.A. Geisendorfer shows how fully the Walker Mining Company was integrated into the International operations management system. The letter is on Accounting Department letterhead; above the name of the department is the phrase, "Inter Departmental Correspondence." Flanking the name of the department are the names of the companies served by the Accounting Department in Salt Lake City: International Smelting Company, Tooele Valley Railroad Company, Utah-Delaware Mining Company, North Lily Mining Company, Walker Mining Company, East Tintic Coalition Mining Company, and Pelleyre Mining & Milling Company. Hunter notified Geisendorfer of concerns that a filing fee may not have been made to accompany an application for a patent on some land near the new mill and surface plant at the Walker mine. Signing his name over the title, cashier, without reference to any particular company, Hunter instructed Geisendorfer in steps to take to clear up the matter with attorneys who had represented the Walker company in the transactions with the U.S. Land Office.[49]

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[47] H.R. Tunnell to Billingsley, telegrams dated 14 and 16 April and 31 May 1926 (Prosecution Exhibit 1, Items 59, 61 and 63); Billingsley to Tunnell, telegrams dated 14 April and 1 June 1926 (Prosecution Exhibit 1, Items 60 and 64); Tunnell to Billingsley, letter dated 24 May 1926 (Prosecution Exhibit 1, Item 62); Billingsley to Tunnell, letter dated 2 June 1926 (Prosecution Exhibit 1, Item 65).

[48] Tunnell to Billingsley, letter dated 4 February 1926; Sales to Billingsley, letter dated 9 February 1926 (Prosecution Exhibit 1, Item 52).

[49] A.D. Hunter to H.A. Geisendorfer, letter dated 15 September 1927 (Prosecution Exhibit 1, Item 68).

In the letter, Hunter quoted a letter written by Walker's previous manager, H.R. Tunnell, in June 1926:

> The new mill and surface works have been built on the Dolly Gulch Placer, which was unfavorably reported. Mr. Sales' recommendation will be carried out by the exchange of land with the Forest Service. Mr. Sales' instructions to make enough lode locations to cover the mill and all buildings or other surface improvements not included in the original mill site locations have been carried out, and a Proof of Labor covering Plumas, Plumas Extension, Plumas No. 1, Plumas No. 2, Plumas No. 3 has been filed at Quincy.[50]

Tunnell's letter demonstrates that Reno Sales, who wore no Walker hat, was making decisions about lands that the Walker Mining Company should acquire for its mining and milling operation, and he was giving direction to Walker management about how to implement the acquisitions.

Not only did the manager of the Walker Mining Company seem to take direction from Lyon and others in the Anaconda/International organization, correspondence from 1930 suggests that others at the Walker mine who would normally be subordinate to the manager also reported directly to Lyon. The best documentation of this seemingly anomalous situation (were the Walker Mining Company managing its operations alone) is the letters from and to D.D. MacLellan, a geologist in the International organization who was assigned to the Walker Mining Company at the time. Lyon addressed him at the Walker Mining Company, and when MacLellan wrote Lyon, he used Geisendorfer's Walker Mining Company letterhead. Yet, his correspondence with Lyon was kept confidential from Geisendorfer. International apparently first sent MacLellan to the Walker mine in 1929 to conduct surface surveys relative to the possible acquisition of adjoining property. In time, however, MacLellan also took on responsibilities concerning underground work, including engineering. In one instance, Geisendorfer even asked Lyon to instruct MacLellan to make a drawing of one of the stopes in the Walker mine, suggesting that while MacLellan was at the mine, he remained in the International chain of command. In another instance, Lyon instructed MacLellan that sending two copies of his reports on development work at the Walker mine, instead of three, would suffice, because Lyon would send one to Geisendorfer (who by then was working in the Salt Lake City office) and keep one for his own files.[51]

An instance in which MacLellan corresponded with Lyon, explicitly bypassing Geisendorfer, occurred in November 1930, when MacLellan wrote asking for information about a suit against the Walker Mining Company being tried in federal court. MacLellan wanted to terminate the employment of a Russian stope engineer named Antoshkin (and called Atkinson in

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[50] Ibid, p. 2.

[51] Lyon to D.D. MacLellan, letters dated 29 July 1929 and 26 February 1930 (Prosecution Exhibit 1, Items 74 and 75); MacLellan to Lyon, 5 March 1930; Lyon to MacLellan, letters dated 8 September and 25 November 1930 (Prosecution Exhibit 1, Item 77).

a later letter) for being disruptive, but Geisendorfer wanted to wait until the suit was settled, out of concern that if Antoshkin were fired, he would testify against the Walker Mining Company in the litigation. MacLellan wanted information from Lyon about the case, and he wanted to learn as soon as it was settled so he could immediately fire Antoshkin. In a postscript, he informed Lyon that he had not discussed the matter with Geisendorfer. In a follow-up letter, MacLellan provided Lyon with an analysis of why there had been some friction among the foremen at the foremen at the Walker mine and why some of the fault lay with Geisendorfer for not delineating each man's sphere of authority.[52]

In the wake of the 1929 stock market crash and the ensuing slump in copper prices, the Walker Mining Company had to make changes to adjust to the worsening market. Low-grade material, which had qualified as ore at higher prices, could now not be mined profitably. And the company needed to try to cut costs, including labor costs. Reno Sales wrote J.O. Elton in October 1930, recommending steps to be taken to classify various reserves in the mine as either minable not minable at current low prices. Sales also recommended placing all geological work, engineering, and sampling under the auspices of one person, to be called the chief geologist-engineer. He recommended that Elton try the reorganization by placing geologist MacLellan in that supervisory position.[53] I have not seen documents explicitly stating whether or how the organization at the mine was revised, but as the narrative below describes, staffing levels were indeed cut and consolidated, somewhat along the lines Sales suggested.

The lines of authority in hiring at the Walker mine were also blurry. For example, in July 1930, William E. Young appeared at the mine bearing a letter from Tom Lyon and addressed to the mine superintendent, John Wallblom, recommending Young for a job underground. In November, Sales made a more blatant move regarding a position at the Walker. He wrote to notify Geisendorfer that Fred Strandberg had accepted Sales' offer of a position as engineer at the Walker mine, with a salary of $250 per month.[54]

In mid-December 1930, MacLellan wrote Strandberg to say that he had notified two Walker employees (including "the Russian") that their employment by the Walker Mining Company would end on December 31. The two had been measuring stopes, and doing that work would be Strandberg's responsibility, with the assistance of two helpers of Strandberg's chosing. Saying the choice was Strandberg's, MacLellan recommended two men for the work, one of whom was William Young. MacLellan sent copies of his Strandberg letter to Lyon and Geisendorfer. In another instance of bypassing Geisendorfer, MacLellan added, in a hand-written note at the bottom of the copy for Lyon, that, while Geisendorfer was getting a copy, it

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[52] MacLellan to Lyon, letters dated 12 and 20 November 1930.

[53] Sales to Elton, letter dated 8 October 1930 (Prosecution Exhibit 1, Item 78).

[54] Lyon to Jack Walbloom [sic], letter dated 21 July 1930 (Prosecution Exhibit 1, Item 76); Sales to Geisendorfer, letter dated 5 November 1930 (Prosecution Exhibit 1, Item 81); Geisendorfer to Sales, letter dated 13 November 1930 (Prosecution Exhibit 1, Item 82).

would probably be better if Geisdendorfer did not know that Lyon was also getting one.. MacLellan also wrote to Geisendorfer with suggestions for rate of pay for the helpers. At the bottom of Lyon's copy of the letter, MacLellan suggested that Geisendorfer might object to the plan, because the "old order" had been of Geisendorfer's devising. Lyon responded that Geisendorfer would have to approve the salary schedule, because the decision would directly affect Walker Mining Company costs, which were Geisendorfer's responsibility.[55]

In September 1931, Lyon sent MacLellan a letter outlining his duties at the Walker mine. It suggests the nature of the management relationship between the Anaconda/International organization the local management at the Walker mine. He began the letter, "I do not know whether you have ever had a letter from me outlining precisely what your duties are at the Walker mine. I am writing you now as a matter of record and to avoid any controversies as to just what you are expected to do."[56] Lyon then named MacLellan's two sets of responsibilities:

> 1- You will be directly responsible for the engineering work, which of course includes the underground records of tonnage broken, etc.
>
> 2- You will be responsible for the development work at the mine. Recommendations for the development shall be properly written and handed to the operators who will, of course, do the work as they are able.[57]

As the several episodes described above demonstrate, MacLellan and the others who had been in his position took their direction, regarding ground to be explored and regarding ground to be opened with shafts, drifts, and crosscuts, from the mining and geology experts in the Anaconda/International organization, typically funneled through Lyon. Once those decisions had been made, miners on the Walker Mining Company payroll undertook the actual excavation, both of development work and of the stoping that produced ore. Those miners were under the supervision of shift bosses and foremen, the mine superintendent (who at this time was John Wallblom), and the general manager of the Walker operations (who at this time was Geisendorfer). This means that the actual drilling, mucking, and tramming of rock was being undertaken by Walker crews under direction of Walker supervisors, but the decisions about where that work should be done were being made by the Anaconda/International organization. Lyon typically delivered the direction and conducted the immediate oversight, but he did so at the direction of the full ACM/International hierarchy, headed by the likes of Reno Sales and William B. Daly, whose decisions were overseen and approved by such top officials as Con Kelley and B.B. Thayer.

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[55] MacLellan to Lyon, letter dated 16 December 1930 (Prosecution Exhibit 1, Item 83); MacLellan to Geisendorfer, letter dated 21 December 1920 (Prosecution Exhibit 1, Item 84); Lyon to MacLellan, letter dated 24 December 1930 (Prosecution Exhibit 1, Item 85).

[56] Lyon to MacLellan, letter dated 30 September 1931 (Prosecution Exhibit 1, Item 88).

[57] Lyon to MacLellan, letter dated 30 September 1931 (Prosecution Exhibit 1, Item 88).

In his letter to MacLellan, Lyon elaborated on how MacLellan should oversee the actual mining that was being conducted by Walker crews:

> When a drift is being run on any vein you will, of course, watch this drift, and if the drift is being run off the vein you will notify the Superintendent in writing. You will not, however, unless especially requested by the Superintendent, give the miners any directions, but take the matter up in the proper manner with the Superintendent, and he will be responsible for giving the necessary directions to the miners. [58]

Lyon closed the letter with instructions MacLellan was to give Strandberg for accurately measuring stopes, so that records being kept by the engineering department would comport with overall production records being compiled by Geisendorfer and his assistant Cooper (other letters of this period suggest that inconsistencies were arising in records being produced by different facets of the Walker operation).

In mid-1931, market conditions had reached the point at which the Walker mine might need to cease production. MacLellan wrote Lyon in early July to report that Geisendorfer had indicated, confidentially, that mining and milling might be suspended at the middle of the month. Were that to happen, Geisendorfer said that MacLellan and Strandberg, along with about twenty men would continue working. MacLellan told Lyon that he would like to include Standberg's two helpers among those retained so that mapping of development work could continue, even if the mine ceased producing ore. Within a few days, however, Giesdendorfer informed his assistant, J.H. Cooper, that officials had decided to continue production at existing levels, but every effort should be made to effect savings in costs, including discontinuing some development work.[59] The decision to keep operating was only temporary.

Late in 1931, Lyon wrote MacLellan in the context of the on-going economic depression and its impact on the copper market. Lyon informed MacLellan that operations at the Walker mine would probably be reduced to half of normal, and overhead costs would have to be reduced accordingly. Lyon had a job in Salt Lake City for which he could use MacLellan's help, which would relieve the Walker operation of MacLellan's salary. This would leave Strandberg in charge of the geological and engineering work MacLellan had been overseeing. Lyon asked MacLellan to inform Strandberg of the impending change but to keep the information otherwise confidential until a public announcement was made through normal channels. [60]

In the new year, Walker operations during the first two months of 1932 were not cut quite as severely as Lyon had predicted (15% instead of 50%), but MacLellan did depart for Salt Lake

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[58] Lyon to MacLellan, letter dated 30 September 1931 (Prosecution Exhibit 1, Item 88).

[59] MacLellan to Lyon, letter dated 6 July 1931 (Prosecution Exhibit 1, Item 86); Geisendorfer to Cooper, letter dated 11 July 1931 (Prosecution Exhibit 1, Item 87).

[60] Lyon to MacLellan, letter dated 9 December 1931 (Prosecution Exhibit 1, Item 89).

City, leaving Strandberg with the title chief engineer, in charge of geological and engineering operations, including sampling.[61] MacLellan's absence, the reduced work schedule, and the larger threat of complete closure of the mine left Strandberg in a state of uncertainty. He sent Lyon a hand-written letter that summarized the difficulties of his personal situation, the turmoil that economic conditions were breeding at the Walker mine, and the climate in a mining organization that was a distinct corporate entity but which had certain key functions being managed and conducted by the parent organization. Only the latter is of concern to this report. Strandberg wanted to know, "Who I am to be responsible to and what I am to be responsible for." When MacLellan left, Cooper (the assistant manager) had taken charge of the sampling operation, which had previously been under MacLellan's supervision. Strandberg wanted Lyon to make it clear who should be giving orders to the sampler.[62]

After describing the difficulty of getting one of his men to give a full effort under the reduce pay schedule, Strandberg then outlined an overall divide in the community at the Walker mine:

> The attitude of the management here is such that they don't want an engineer around, much less one from Butte, who when he comes here is only another dam [sic] Anaconda man to try to get rid of.[63]

Such an attitude is understandable, when one considers that under a conventional organizational chart at a mine, the geologist and the engineer would report to the general manager, but in the scheme by which the ACM had incorporated operations at the Walker mine into the larger Anaconda/International organization, the geologist and engineer answered to a supervisor, Lyon, who was part of the management organization of the Anaconda enterprise but who had no title in the Walker organization. A letter from Lyon to Sales in April 1932 suggests that the relationship between the ACM/International organization and the Walker organization had been deteriorating in the year prior to closure at the end of February.[64]

Incidentally, the question of who had charge of the sampler was resolved in Strandberg's favor. Geisendorfer sent Cooper a letter telling him that sampling should remain as it formally had been, the responsibility of the engineering (Strandberg's) department. And Lyon sent Strandberg a letter quoting from Geisendorfer's letter to Cooper. Regarding the problem Strandberg was having with the man who did not want to give full effort, despite the reduced salary, Lyon assured him that he had the authority to fire anyone who was not working up to expectations.[65]

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[61] F.W. Strandberg to Lyon, letter dated 5 February 1932 (Prosecution Exhibit 1, Item 92).

[62] Strandberg to Lyon, letter dated 28 January 1932 (Prosecution Exhibit 1, Item 90).

[63] Strandberg to Lyon, letter dated 28 January 1932 (Prosecution Exhibit 1, Item 90).

[64] Lyon to Sales, letter dated 1 April 1932 (Prosecution Exhibit 1, Item 99).

[65] Geisendorfer to J.H. Cooper, letter dated 30 January 1932 (Prosecution Exhibit 1, Item 91);

When the Walker mine closed, Strandberg returned to Butte, but the Walker Mining Company only paid him for his time until he left the mine, four days in March, and not his travel time to Butte, as had been customary under earlier circumstances. Sales was resentful of this action on the part of the Walker Mining Company. More importantly, his letter expressing that attitude also indicates that, while Strandberg may have been part of an engineering department at the Walker mine that answered to International organization in Salt Lake City, he was paid by the Walker Mining Company.[66]

The Walker Mining Company had tried to keep its men employed at a decreased rate through the winter months. After two months of curtailed operations, the Walker Mining Company closed the mine and mill at the end of February 1931. When the mine closed, the question arose concerning development work. Reno Sales and Tom Lyon recommended keeping a skeleton crew at the mine to complete some underground development work that had been neglected during curtailed operations prior to closure. Such development work would allow the mine to resume full production for a prolonged period, once the shut-down ended. Sales recognized, of course, that a decision to incur costs during a period of no production, and therefore no revenue, would have to be left in the hands of the Walker Mining Company. Evidently, the Walker Mining Company decided not to complete any development work during the shut-down, and annual reports indicate that the only expenses incurred were for watchmen at the property and minimal supervisory staff, who also completed some maintenance on the physical plant. The only revenue during that period was from cement copper recovered from mine water in a precipitation plant. This suggests that the company kept pumps operating to prevent the mine from flooding. Production at the mine and mill resumed in January 1937.[67]

During the summer of 1937, Lyon sent M.B. Kildale to the Walker mine to report on development work being undertaken there. In addition to fairly detailed descriptions of development in various parts of the mine, Kildale reported on the organizational structure:

> The geological work at the Walker mine is being well handled under the direction of Mr. Droubay, who is working in close cooperation with, and giving much

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Lyon to Strandberg, letter dated 6 February 1932 (Prosecution Exhibit 1, Item 93).

[66] Sales to Lyon, letter dated 14 March 1932 (Prosecution Exhibit 1, Item 96); Sales to Lyon, letter dated 24 March 1932 (Prosecution Exhibit 1, Item 98).

[67] Lyon to Elton, letter dated 8 March 1932 (Prosecution Exhibit 1, Item 94); Lyon to Sales, letter dated 12 March 1932 (Prosecution Exhibit 1, Item 95); Sales to Elton, letter dated 14 March 1932 (Prosecution Exhibit 1, Item 97); Statement 1931 of the Walker Mining Company, annual report dated 15 March 1932; Statement 1932 of the Walker Mining Company, annual report dated 15 March 1933; Statement 1933 of the Walker Mining Company, annual report dated 17 March 1934; Statement 1934 of the Walker Mining Company, annual report dated 25 March 1935; Statement 1937 of the Walker Mining Company, annual report dated 24 March 1938.

> valuable advice to the operating department. The development headings are mapped nearly every day and the valuable stope sections are posted up as soon as the engineering measurements are available. Closer underground direction of the development headings by either the operating or geological departments is needed, however, and closer check on carrying out of geological recommendations is advisable.[68]

Direction for development was communicated among Sales, Lyon, and Droubay, it will be remembered, in the form of "recommendations."

In the late 1930s, Reno Sales continued to direct work routinely in the Walker mine based on his position as the ACM's chief geologist. In 1938, for example, M.H. Gidel, Sales' top assistant in the ACM's geology department, made a set of recommendations for development work to be conducted at the mine. Sales reviewed Gidel's memorandum and then wrote Tom Lyon, International's chief geologist, informing him of the recommendations with which he concurred and which he did not approve. A week after writing that letter, Sales met in Butte with Gidel and with Clyde E. Weed, manager of mining operations for the ACM's entire enterprise, and the three agreed upon a course of development work to be implemented at the Walker mine. Sales recorded the decisions in a letter to Weed, with a copy to Lyon. Sales specified the actions that were to be taken, listed other recommendations that could be implemented at the mine if they proved convenient, and specified a recommendation, driving a particular crosscut, that was to be eliminated from the work plan. Actions to be taken at the mine included driving drifts and crosscuts in the mine.[69]

Three men, Sales, Gidel, and Weed, who had no official roles at the Walker Mining Company, were deciding the course of development at the Walker mine, and they informed a fourth, Tom Lyon, of their decisions. As with the other three, Lyon was a man in authority, but he held no office in the Walker Mining Company. In late September, International's John Dugan informed Weed by letter that the development work at the Walker mine was underway.[70] As development work continued into December, Walker geologist Seth Droubay suggested some revisions to the work plan. Again, Sales reviewed the proposals and decided which he approved and which he wanted to consider further. He communicated his decisions in a letter to Tom

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[68] M.B. Kildale to Lyon, letter dated 24 August 1937 (Prosecution Exhibit 1, Item 115).

[69] Sales to Tom Lyon, letter dated 10 August 1938 (Prosecution Exhibit 1, Item 131); Sales to Clyde E. Weed, letter dated 17 August 1938 (Prosecution Exhibit 1, Item 132).

[70] John F. Dugan to Weed, letter dated 23 September 1938 (Prosecution Exhibit 1, Item 134). Dugan held a comparable position at International to Weed's at the ACM: general superintendent of mines. He was also a director of the Walker Mining Company in the late 1930s, but I have not seen evidence that he was an officer or a manager; see the Walker Mining Company's 1937 annual statement.

Lyon. The proposals Sales approved and the proposals he rejected included driving drifts and crosscuts in the mine.[71]

In January 1939, the ACM hierarchy of Weed, Sales, and Gidel had agreed on a new development plan for the Walker mine. Weed, who was the ACM's general manager of mines, authorized John Dugan, who was International's general superintendent of mines, to start work. At the same time, Sales wrote Lyon informing him of the development decisions the ACM managers had made for the Walker mine.[72] Later in January 1939, Walker geologist Droubay wrote another letter to Lyon, recommending four more development projects in the Walker mine. Droubay copied Gidel (and not Sales, because Sales was in South America), and he told Lyon he would send maps of the recommendations to Dugan, letting Dugan know that the work was subject to Lyon's approval.[73] The letter makes it clear that Droubay understood himself to be working under Lyon's direction, even though Lyon was not Walker official.

As development work continued in spring 1939, Droubay wrote Lyon to indicate that he and the Walker's manager L.F. Bayer needed authorization from International's mining department in Salt Lake City to begin new development work. Droubay wrote that that he would send some new recommendations to Lyon and Dugan, and he and Bayer would await "approval or rejection" of the recommendations. He closed the letter, "I will assume that any approved recommendation received by Mr. Bayer has had your OK."[74] A few days later, Kildale wrote Dugan, addressing him as International's general superintendent of mines, to report that he and Lyon had reviewed Droubay's recommendations and that International's geology department approved them.[75]

2. Management of Other Facets of Walker Operations

As a large, integrated enterprise, the ACM had officials who oversaw the various areas of expertise that were needed to conduct the various facets of operations. For example, Wilbur Jurden was an engineer who oversaw construction activities within the ACM enterprise. Thus, when the Walker Mining Company decided to expand its concentrator, Jurden oversaw the preparation of estimates for the construction; he estimated the work would cost $72,130. He addressed his correspondence on the planning and the estimate to Elton at International, not Elton at Walker, and he copied the ACM's top metallurgist, Frederick Laist, because the

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[71] Sales to Lyon, letter dated 17 December 1938 (Prosecution Exhibit 1, Item 139).

[72] Weed to Dugan, letter dated 4 January 1939 (Prosecution Exhibit 1, Item 147); Sales to Lyon, letter dated 5 January 1939 (Prosecution Exhibit 1, Item 148).

[73] Droubay to Lyon, letter dated 25 January 1939 (Prosecution Exhibit 1, Item 151).

[74] Droubay to Lyon, letter dated 20 April 1939 (Prosecution Exhibit 1, Item 161).

[75] Kildale to Dugan, letter dated 25 April 1939 (Prosecution Exhibit 1, Item 163).

concentrator was a metallurgical facility.[76] Once the Walker company authorized the construction, Elton wrote Laist, asking that Laist send Bernard Morrow with Elton on a site visit to the Walker mine to look over the plans that local managers were developing. Elton stated that he was not competent approve the plans, and he wanted Morrow's expertise.[77] Upon his return to Anaconda, Morrow reported on the trip to Laist, approving a few minor revisions to the plan for the concentrator. It is noteworthy that Laist used International letterhead with an Anaconda address, and he addressed Elton at International in Salt Lake City.[78] ACM officials were well equipped with letterhead that allowed them to wear appropriate hats as they wrote letters and issued directives.

Correspondence among the top ACM and International managers also suggests that the ACM and its wholly-owned subsidiary were making personnel decisions for the Walker Mining Company. In 1937, ACM managers trained Edward Broadwater in Butte to serve as a geologist at the Walker mine. Broadwater had been working at the ACM's sampling department. When the company transferred him to the geology department for training, it began charging his wages to the Walker company. Reno Sales, writing from New York, instructed Murl Gidel to have someone monitor Broadwater's development in learning the ACM's method of underground recording and then to notify Jack Dugan when Broadwater would be heading to the Walker mine. Dugan, International's general superintendent of mines, was a Walker director, but he was not a Walker officer or manager, yet he was the individual who had requested that Anaconda train someone to be sent to the Walker. Once Broadwater had completed training at several assignments in the Butte operations, Gidel notified Tom Lyon that Broadwater would be heading to the Walker in about a week.[79]

In January 1939, a job for a geologist at Chiquicamata, the ACM's property in Chile, looked like it might open. Reno Sales wrote Tom Lyon, suggesting that Lyon encourage a Walker geologist named Broadwater to apply. Sales also had words for Lyon on how he, Lyon, would replace Broadwater, should Lyon be willing to allow Broadwater to transfer to Chile.[80] Lyon was not a top manager at Walker, so he would not normally be involved in hiring a Walker geologist, but given the structure of the management system of the Anaconda enterprise, it is not surprising that Lyon would be responsible for hiring a geologist for the Walker Mining Company.

In February 1939, the ACM decided to send Broadwater to Chile. Lyon sent a telegram to Gidel asking if Gidel had anyone in mind to hire for the Walker geologist position. Gidel sent

[76] Wilbur Jurden to Elton, letter dated 8 January 1929 (Prosecution Exhibit 1, Item 71).

[77] Elton to Laist, letter dated 25 March 1929 (Prosecution Exhibit 1, Item 72).

[78] Laist to Elton, letter dated 6 April 1929 (Prosecution Exhibit 1, Item 73).

[79] Sale to Gidel, letter dated 27 May 1937 (Prosecution Exhibit 1, Item 112); Gidel to Lyon, letter dated 8 June 1937 (Prosecution Exhibit 1, Item 113).

[80] Sales to Lyon, letter dated 5 January 1939 (Prosecution Exhibit 1, Item 148).

Lyon a telegram recommending Virgil Chamberlain for the job as geologist at the Walker mine. Gidel recommended that before Chamberlain went to California, he should train for two weeks in the ACM's geology department at Butte. While at Butte, Chamberlain would be paid by Walker, and the Walker company would also pay for Chamberlain's travel costs. Lyon responded to Gidel, asking that he give Chamberlain the two weeks' training at Butte and then send him to the Walker mine. Lyon stated that Walker would pay the expenses, and he asked Gidel to let the Walker's Droubay know when Chamberlain would be ready to leave Butte.[81] Lyon took Gidel's recommendation and hired Chamberlain to work for the Walker Mining Company, even though Lyon was not an official of the Walker company. Gidel then told an ACM bookkeeper at Butte to put Chamberlain on the Walker payroll, told the bookkeeper what Chamberlain's salary would be, and told him to charge Chamberlain's travel expenses to California to the Walker Mining Company's account. Two weeks later, Gidel wrote Droubay to inform him that he had hired Chamberlain to work as Droubay's assistant, that Chamberlain would be paid $160 per month, that Chamberlain's salary while in Butte and his travel expenses would be charged to Walker, and that Chamberlain was an ambitious young man. Gidel also noted that Broadwater had received similar training at Butte before being sent to the Walker Mining Company.[82] This line of correspondence shows that the Walker manager was not responsible for hiring his geologist; officials in the ACM/International hierarchy hired the person who filled this key Walker staff position.

3. Operations at the Walker Mine in the Closing Years

In 1939, the Walker mine faced an uncertain future. Exploration for new leads had been disappointing, and the extraction of known reserves was nearing an end. Reno Sales summarized the situation for J.O. Elton (with copies to ACM president Con Kelley, Clyde E. Weed, Tom Lynn, and John Dugan): most of the Walker's production had been relatively profitable because it derived from ore bodies that were above the 700 level haulage adit. Such material could be mined at relatively low cost. Material that was being found at levels below the 700 level adit were of disappointingly low grade. Because of their location below the 700 level adit, they would have to be hoisted, in order to be extracted, thereby adding to the cost of mining. Sales and his colleagues in the ACM hierarchy had to decide how much longer they would spend money trying to find richer ore bodies. Sales drafted a list of recommended development and exploratory drilling programs. A month later, Lyon wrote Droubay a letter with instructions for beginning the drilling program.[83]

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[81] Lyon to Gidel, telegrams dated 2 February 1939 (Prosecution Exhibit 1, Item 155) and 3 February 1939 (Prosecution Exhibit 1, Item 156); Gidel to Lyon, telegram dated 2 February 1939 (Prosecution Exhibit 1, Item 154).

[82] Gidel to W.J. Wilcox, letter dated 6 February 1939 (Prosecution Exhibit 1, Item 157); Gidel to Droubay, letter dated 20 February 1939 (Prosecution Exhibit 1, Item 159).

[83] Sales to Elton, letter dated 1 July 1939 (Prosecution Exhibit 1, Item 168); Lyon to Droubay, letter dated 2 August 1939 (Prosecution Exhibit 1, Item 171).

John Dugan traveled to California in August 1939 to oversee the preparations for the new program. Upon his return to Salt Lake City, he discussed the developments with Lyon and wrote a letter reporting to Weed. Dugan, an International official, described instructions he had given Walker manager Bayer, and he described future exploratory work he wanted to have done at the Walker mine, if it was acceptable to Weed and Sales.[84] Once again, an International official without a management hat at Walker was giving direction the Walker manager, and he was seeking approval for actions from officials of his own company's parent corporation.

On the same day Dugan wrote Weed, Lyon wrote Sales. After reading both Dugan's and Lyon's letters, Sales responded to Lyon with further direction concerning the Walker drilling program. As the development and exploration programs proceeded at the Walker mine, geologist Droubay encountered some questions, about which he sought direction directly from Sales (with copies to Lyon and Dugan). Sales responded directly to Droubay, telling him which development work to continue and which to discontinue. Sales' letter did not reach Droubay in time to stop him from beginning to drill one of the holes, so the latter sent a telegram to Sales explaining why he had begun the work, extending the drill hole 300 feet. Sales took Droubay's telegram in stride and sent him another letter, giving more direction for how to proceed with the work at the Walker mine.[85]

Sales' authority over operations at the Walker mine is clearly apparent in two episodes in late 1939. The first occurred in October, when Sales made an unannounced visit to the Walker mine, spending two days inspecting results of the exploratory drilling operation and developing a program for exploring the footwall of the 712 orebody.[86] Conventional protocol among mining companies, in my experience conducting research into the history of the American mining industry, is that officials of a company could make surprise visits to that company's facilities, but visits by people from outside the company were generally announced in advance. In this episode, however, Seth Dourbray appears not to have questioned Sales' authority to arrive unannounced at the Walker mine and to have access to results of the company's exploratory drilling program. Droubay also accepted Sales' direction in mapping a new program for exploration.

Sales' October 1939 visite to the Walker mine was made in the company of Dugan and H.M Hartmann of Salt Lake City. Together with Droubay they examined current maps of the mine. After Sales had formulated his development recommendations, Droubay documented

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[84] Dugan to Weed, letter dated 23 August 1939 (Prosecution Exhibit 1, Item 176).

[85] Lyon to Sales, letter dated 23 August 1939 (Prosecution Exhibit 1, Item 177); Sales to Lyon, letter dated 26 August 1930 (Prosecution Exhibit 1, Item 1179); Droubay to Sales, letter dated 31 August 1939 (Prosecution Exhibit 1, Item 180); Sales to Droubay, letter dated 5 September 1939 (Prosecution Exhibit 1, Item 181) and 7 September 1939 (Prosecution Exhibit 1, Item 183); Droubay to Sales, telegram dated 6 September 1939 (Prosecution Exhibit 1, Item 182).

[86] Droubay to Lyon, letter dated 21 October 1939 (Prosecution Exhibit 1, Item 196).

them in a memorandum. Sales followed Droubay's memorandum with a letter to Dugan (copies to Lyon and Droubay) confirming that the document correctly conveyed his recommendations. Two months later, based on the results of the drilling program, showing that a vein ran further south than had been anticipated, Droubay sent Lyon a letter (with copies to Dugan and Sales), recommending that miners develop the vein by driving a crosscut from one part of the 600 level, rather than extending a drift from another part of the 600 level, which Sales had initially recommended.[87] Lyon responded to Droubay that he and Dugan had discussed the matter, and they concurred with Droubay's recommendation. Hartmann had also written a note on Dugan's copy of Droubay's letter indicating that he approved of Droubay's recommendation. Lyon concluded his letter to Droubay: "If Mr. Sales has any reasons for asking you to do the work as he originally suggested, you will hear directly from him."[88] Two days later, Sales wrote Droubay (with copies to Lyon, Dugan, and Weed), "I have no objection to doing the work as you have laid out."[89]

These letters show clearly the chain of command at the Walker mine regarding exploration and development. Droubay received his direction from Lyon in Salt Lake City, and Lyon, who had no Walker position, provided that direction in consultation with Dugan, who was a Walker director but who had no title as an officer or manager of the Walker Mining Company. Lyon was International's chief geologist, and Dugan was in charge of International's mining operations. And Lyon and Dugan gave their direction to the Walker operation for exploration and development under the direct oversight of Sales and Weed, who were the ACM's chief geologist and manager of mines, respectively.

Sales' authority over Walker operations was also apparent in a November 1939 episode, in which Droubay needed immediate direction on how to resolve a situation. Droubay had encountered more problems with the drilling program, this time caused by snow. Seeking direction on how to proceed, he sent Sales two telegrams, one to the ACM's New York offices and one to Butte. Sales responded immediately, telling Droubry to discontinue the drilling program and await further instructions. The next day, Sales telegraphed instructions to Droubay on how to continue the drilling program. Once the immediate situation was resolved, Sales and Droubay continued normal correspondence through the mail, with Lyon participating.[90]

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[87] Droubay, memorandum dated 18 October 1939 (Prosecution Exhibit 1, Item 195); Dugan to Weed, letter dated 24 October 1939 (Prosecution Exhibit 1, Item 198); Droubay to Lyon, letter dated 22 December 1939 (Prosecution Exhibit 1, Item 213).

[88] Lyon to Droubay, letter dated 26 December 1939 (Prosecution Exhibit 1, Item 215).

[89] Sales to Droubay, letter dated 28 December 1939.

[90] Droubay to Sales, telegrams dated 14 November 1939 (Prosecution Team Exhibit 1, Items 201 & 202); Sales to Droubay, telegrams dated 15 November 1939 (Prosecution Team Exhibit 1, Item 203) and 16 November 1939 (Prosecution Team Exhibit 1, Items 204); Droubay to Sales, letter dated 18 November 1939 (Prosecution Team Exhibit 1, Item 205); Lyon to Sales, letter dated 20 November 1939 (Prosecution Team Exhibit 1, Item 206); Sales to Droubay, letter dated 21 November 1939 (Prosecution Team Exhibit 1, Item 207) and 22 November 1939 (Prosecution

Through the 1930s, the Walker mine's performance had been rather marginal, and in 1940 the ACM hierarchy began to considering whether it was reasonable to continue operations at the mine and mill. For a small company operating only a single mine and a mill, such considerations would have been deliberated solely in light of the company's profitability and the willingness of the stockholders to risk investment in further exploration and development in the hope of finding extensions of the known ore bodies that merited continued operation. When ACM officials weighed the costs and benefits, however, they did so with the overall well-being of the ACM enterprise in mind, and that included well-being of International's smelter at Tooele. The Walker mine was one of the smelter's sources of ore, and the smelter's ability to operate at a profit was dependent on being able to treat volumes ore sufficiently close to capacity that both fixed and variable costs could be covered by revenues. That ACM officials weighed the Walker mine's future in light of the smelter's well-being is evident in a March 1940 memorandum prepared by Reno Sales, in which he delineated those two lines of reasoning.[91]

The ACM's top managers took an active interest in both exploratory drilling and underground development work during the spring of 1940, as it appeared there might be some mineralized rock of adequate grade in an area north of what the company called the Piute ore body, in the north part of the mine. Both Reno Sales and Clyde Weed received reports from California and issued directives, both to their counterparts at International (Lyon and Dugan, respectively) and to Droubay at the Walker mine. Lyon also directed Droubay's development work from Salt Lake City.[92] By May, Sales and Weed had concluded that there were no promising options for underground drilling remaining the Walker's underground workings, and the only remaining course of exploration would be surface drilling north of the Piute ore body. After Sales and Weed discussed the matter in Butte, Weed went to New York to discuss the future of the Walker mine with ACM president Con Kelley (also International president) and ACM executive vice president James R. Hobbins. Weed reported to J.O. Elton that Kelley and Hobbins "agreed to allow us to drill two or three of these holes at this time." Weed advised Elton to get locations for the new drill holes from Sales. Weed closed his letter to Elton, "Will you please advise me when Mr. Sales has approved this work, and send me a sketch showing the locations of the hole."[93] Once again, the ACM's top officials were making decisions about the future of the Walker mine and were issuing directives for how those decisions would be implemented at the mine.

Team Exhibit 1, Item 208).

[91] Sales, memorandum dated 15 March 1940 (Prosecution Team Exhibit 1, Item 222).

[92] Sales to Droubay, letter dated 23 April 1940 (Prosecution Team Exhibit 1, Item 226); Weed to Dugan, letter dated 25 April 1940 (Prosecution Team Exhibit 1, Item 228); Lyon to Droubay, letter dated 27 April 1940 (Prosecution Team Exhibit 1, Item 229).

[93] Weed to Elton, letter dated 8 May 1940 (Prosecution Team Exhibit 1, Item 234).

The Walker Mining Company's minority stockholders were clearly dependent on ACM management, not only for managing the mine's operations but also for understanding the performance they should expect of the mine. As Sales and Weed were preparing their plans for the new exploratory program, they also were preparing a report, apparently on the final operations of the mine, should no additional ore be found. Weed's initial draft showed estimated reserves of nearly 1,900,000 tons. Reviewing the draft, Sales observed that the estimate was only "probable or possible," but it was not the 989,190 tons of proven reserves, as of March 1940. He suggested using the smaller volume, so that when the mine closed after three years or so, and the minority stockholders looked at what had been mined in that time, they would not have cause to complain that the mine was closing before all the estimated reserves were extracted. Sales wrote that he would feel more comfortable adding to the known reserves during the period of winding down operations, if such were found, rather than having to explain why expectations had not been met.[94] In the report that Weed and Sales issued, they provided the figure of 1,869,000 tons "probable" recoverable ore, and another figure of 1,061,100 tons "developed" recoverable, suggesting that if no new recoverable ore was found, then the actual production between June 1940 and mine closing would be somewhere between the two figures. They recommended that if no new ore was found during the current exploration and development plan, then remaining known reserves at the Walker mine should be mined as quickly as possible.[95]

As the Walker mine appeared to be entering its final stages of operation in 1940, Weed wrote ACM and International president Con Kelley, laying out the options for the last phases of exploration and for developing and extracting the remaining ores. He closed the letter by asking Kelley, "Will you please advise me if these recommendations meet with your approval, sending a copy of your letter to Mr. Elton so that he will be advised as quickly as possible."[96]

Meanwhile, Droubay wrote a letter to International's chief geologist, Tom Lyon, documenting the agreement that had been reached when Lyon, Sales, and Weed had recently visited the Walker mine: the only development work to be done was that immediately needed to prosecute mining. He then outlined the development that such a program would entail for each ore body in the Walker mine, closing the letter, "This program covers all development which is at present both important and necessary and no additions, excepting headings necessary for stoping, will be made unless ordered or approved by you, Mr. Sales, Mr. Weed, and Mr. Dugan.[97] Once again, the local staff of the Walker mine were responding to orders given by ACM and International officials who had no positions in the management hierarchy of the Walker mine. Only Dugan was a director of the Walker Mining Company, but he held no known title as an officer or a manager of the Walker company.

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[94] Sales to Weed, letter dated 15 May 1940 (Prosecution Team Exhibit 1, Item 237).

[95] Weed and Sales, "Report Covering Present Conditions at the Walker Mine," 15 June 1940 (Prosecution Team Exhibit 1, Item 238).

[96] Weed to C.F. Kelley, letter dated 7 October 1940 (Prosecution Team Exhibit 1, Item 242).

[97] Droubay to Lyon, letter dated 10 October 1940 (Prosecution Team Exhibit 1, Item 243).

By early 1941, operations at the Walker mine shifted in their orientation toward the cessation of production. With that reality in mind, calculations in planning for development shifted. Whereas a mine with a long future ahead of it would undertake development work that yielded an effective configuration of shafts, crosscuts, and drifts, even if the excavation was through country rock, in the expectation that production of ore through those developments some months in the future would pay the expenses of the dead work. In 1923, for example, Sales and his geologists had wanted Hart to drive a straight drift in developing a new level, and they were frustrated that Hart was creating a crooked drift, because he was following the richest part of the vein. In early 1941, however, there were no longer expectations that future production could pay the costs of current development. Therefore, in January 1941, Sales wrote Droubay a stern letter because a drift had turned away from the vein. He wrote, "If I have not made myself clear in the past, I will do so now and advise that development faces be kept in the vein as far as possible in order that the amount of waste broken be kept at a minimum." [98]

The next month, International's general superintendent of mines, John Dugan, wrote H.M. Hartmann, who was by then manager at the Walker mine, with instructions for how to proceed with certain drilling and development operations. Dugan sent Weed, Sales, and Lyon copies of the letter. [99] This letter is noteworthy because it shows Dugan providing the Walker's manager with a level of direction comparable to that which Lyon provided the Walker's geologist. Because most of the records I have been able to analyze are from the records of the ACM's geology department, they mostly document the geological direction that ACM officials were giving.

As operations at the Walker mine continued to wind down in 1941, manager H.M. Hartmann worked to try to keep costs down. At the end of June, he wrote International's general superintendent of mines, John Dugan, asking if a decision had been made yet on whether to cease development work on the 1200 level. The company had considerable equipment at that level, and if development were to cease, Hartmann could move the equipment elsewhere in the mine, obviating the need to make new purchases. He informed Dugan, "It would be very nice and helpful, and save us money, if Mr. Weed and Mr. Sales could decide shortly whether there was any use of keeping this Level open or not."[100] Clearly, Hartmann needed direction on this matter from higher in the organizational structure, and that organizational structure extended beyond the parameters of the Walker Mining Company's corporate and management structure. Dugan forwarded Hartmann's letter to Sales, with a copy to Weed, asking for an "early decision." After Weed and Sales conferred on the matter, Sales wrote Dugan to say that the 1200 level could be abandoned and the Walker company could quit pumping water from the level. Accordingly, Dugan sent Hartmann a letter instructing him to discontinue work on the 1200 level.[101]

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[98] Sales to Droubay, letter dated 9 January 1941 (Prosecution Exhibit 1, Item 254).

[99] Dugan to H.M. Hartmann, letter dated 13 February 1941 (Prosecution Exhibit 1, Item 269).

[100] Hartmann to Dugan, letter dated 30 June 1941 (Prosecution Exhibit 1, Item).

[101] Dugan to Sales, letters dated 3 July 1941 (Prosecution Exhibit 1, Item 294) and 12 July

In July 1941, Eldon Lomnes, chief engineer at the Walker mine, sent Dugan a letter reporting that, at Dugan's suggestion, the staff at the mine had resumed using Development Recommendation Sheets for proposing new work. The next month, Sales wrote Lyon with the idea that, although it probably made little difference, the recommendation sheets should be from the Walker Mining Company, not International Smelting & Refining. Sales reported that Weed concurred and asked Lyon to discuss the matter with J.O. Elton.[102] A few days later, Lyon wrote Lomnes, asking that in future he use recommendation sheets of the Walker Mining Company's Geological Department. Lyon wrote that International "is really not doing the work at the Walker and we would much prefer the geological department there be designated as the Walker Geological Department." [103]

It is unclear why the ACM/International management was concerned about the printed heading of the Development Recommendation Sheets in summer 1941. There is a collection of recommendation sheets in the University of Wyoming collection of the ACM's geology department. Dates run from to October 1937 to August 1941, and they are all on paper headed: "Recommendation for Development Work, Geological Department, International Smelting & Refining Co." [104]

By August 1941, the Walker mine had reached the point at which the ACM's managers did not believe there was any point in continuing operations at current copper prices. The mine had been losing money for more than a year. There was one more possibility, however, for prolonging the life of the mine. Clyde Weed wrote ACM president J.R. Hobbins (who had succeeded Con Kelley as president in April 1940, when Kelley became chairman of the ACM board) asking him to look into the possibility of the U.S. government taking an interest in the mine. This idea undoubtedly arose because the government was preparing for the possibility of war, in which case the nation would need all the copper it could produce for the war effort. The government wanted copper producers to identify all potential sources of copper ore that could help increase the government's supply of the strategic metal. Weed reminded Hobbins that an important factor in the future of the Walker mine was consideration for the minority stockholders. Weed copied his letter to Kelley, Elton, Sales, and Laist. Hobbins responded to Weed indicating that he thought that the government should be given an opportunity to consider the situation, but he doubted the government would act, given the relatively small output of the Walker mine. He also suggested that J.O. Elton should call a meeting of the Walker board of

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1941 (Prosecution Exhibit 1, Item 299); Sales to Dugan, letter dated 9 July 1941 (Prosecution Exhibit 1, Item 300).

[102] E.J. Lomnes to Dugan, letter dated 24 July 1941 (Prosecution Exhibit 1, Item 302); Sales to Lyon, letter dated 25 August 1941 (Prosecution Exhibit 1, Item 317).

[103] Lyon to Lomnes to Dugan, letter dated 28 August 1941 (Prosecution Exhibit 1, Item 319).

[104] Recommendation for Development Work, sheets dated 9 October 1937 to 25 August 1941 [these sheets are in file 16202_02b, pp 78-90].

directors and advise them it was no longer practical to operate the Walker mine with cost of production exceeding the price of copper.[105]

In early September 1941, Hartmann informed workers at the Walker mine that it might close by October 1. The Walker mine received a brief reprieve when development work between the 900 and 1000 levels in the Piute ore body showed a body of copper ore with higher than usual gold assays. The reprieve was short-lived, however, and by November the Walker mine had closed.[106]

Available documents show that ACM and International officials and managers were directing operations at the Walker mine, deciding where for example, shafts, drifts, and crosscuts would be located. The full extent of the ACM's and International's direct involvement in managing the Walker Mining Company's operations can be seen by the fact that ACM and International officials and managers often gave direction about Walker operations without going through the Walker manager, but rather by communicating directly with the Walker company's staff.

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[105] Weed to Hobbins, letter dated 21 August 1941 (Prosecution Exhibit 1, Item 313); Hobbins to Weed, letter dated 9 September 1941 (Prosecution Exhibit 1, Item 323).

[106] V.R. Chamberlain to Gidel, letters dated 5 September 1941 (Prosecution Exhibit 1, Item 322) and 13 November 1941 (Prosecution Exhibit 1, Item 335); Sales to Weed, letter dated 4 October 1941 (Prosecution Exhibit 1, Item 327); Sales to Hartmann, letter dated 10 October 1941 (Prosecution Exhibit 1, Item 330).

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RESUME

SUMMARY OF EXPERIENCE

Dr. Quivik is Associate Professor of History in the Dept. of Social Sciences at Michigan Technological University, where he also serves as editor of *IA: The Journal of the Society for Industrial Archeology*. He previously taught history of technology and environmental history as a lecturer in the Dept. of History & Sociology of Science at the University of Pennsylvania (2006-2009) and as a lecturer at the University of California at Berkeley in the Interdisciplinary Studies Program, College of Engineering, and in the History Dept. (1999-2001). He also taught as an adjunct at Montana Tech in Butte and at Montana State University in Bozeman.

Since 1976, Fred Quivik has been professionally active in the fields of history of technology, industrial archeology, and cultural resource management. He makes that experience available to clients as the principal historian in the firm Quivik Consulting Historian, Inc., which he incorporated in 1998. A significant body of his work in recent years has been as an expert witness (historian of technology) in Superfund litigation concerning the remediation of mining and metallurgical wastes in Montana (the Clark Fork Superfund project embracing Butte and Anaconda and the Libby Superfund project), Idaho (the Bunker Hill Superfund project in the Coeur d'Alene mining district, and the Stibnite Superfund project in the Yellow Pine district), the State of Washington (the Midnite Mine Superfund project), New York (the Li Tungsten Superfund project), and Arizona (the Pinal Creek project in the Globe/Miami mining district).

In 1982, Dr. Quivik founded Renewable Technologies, Inc. (RTI), an historic preservation consulting firm in Butte, Montana, that is still a thriving business. In 1990, Dr. Quivik left RTI to attend the University of Pennsylvania, where he was a William Penn Fellow. He received the PhD in History and Sociology of Science from Penn in 1998. The title of his dissertation is "Smoke & Tailings: An Environmental History of Copper Smelting Technologies in Montana, 1880-1930." While writing his dissertation, he continued to work as a consultant.

As an expert witness for the U.S. Dept. of Justice, providing litigation support in Superfund litigation, Dr. Quivik's specialty has been industrial history, especially the history of the mineral industries, with special attention to the discharge of byproducts and their historical impacts on the environment. He has extensive knowledge of the role of industrialization in the development of the American West. At RTI, he completed surveys and Historic American Engineering Record (HAER) documentation of dams and hydroelectric generating plants of the Montana Power Company, of the Corps of Engineers' Fort Peck Dam, and of Bureau of Reclamation dams and irrigation infrastructure in Idaho, New Mexico, Oregon, and Wyoming. He conducted statewide historic bridge inventories in Minnesota, Montana, Nebraska, and North and South Dakota. He has also prepared business and technological histories of the Connellsville Coke Region in southwestern Pennsylvania, the Kaiser shipyards in Richmond, CA, and the Ford Motor Company's Richmond assembly plant (a.k.a. the Richmond Tank Depot) for HAER.

Dr. Quivik's experience in cultural resource management includes conducting surveys of rural, urban, and industrial historic sites and districts, preparing National Register nominations, performing determinations of eligibility and impact assessments according to federal guidelines, preparing photo-documentation and measured drawings of historic sites, and developing planning documents for the preservation of historic districts. Dr. Quivik is particularly skilled at researching and developing historical contexts within which to assess the significance of cultural resources. He served for ten years on the Montana State Historic Preservation Review Board.

EDUCATION

PhD, History and Sociology of Science, University of Pennsylvania, Philadelphia, 1998. Dissertation title: "Smoke and Tailings: An Environmental History of Copper Smelting Technologies in Montana, 1880-1930." M.A. in 1992.

Master of Science in Historic Preservation, Graduate School of Architecture and Planning, Columbia University, New York City, 1977.

Bachelor of Environmental Design, School of Architecture, University of Minnesota, Minneapolis, MN, 1975.

Bachelor of Arts in Art, St. Olaf College, Northfield, MN, 1971.

EMPLOYMENT HISTORY

Associate Professor of History, Department of Social Sciences and Graduate Program in Industrial Archaeology, Michigan Technological University, Houghton, MI, January 2010 to present.

Consulting Historian of Technology, principal in the firm Quivik Consulting Historian, Inc., working in litigation support as an expert witness, and in the evaluation of historic industrial and engineering sites as a cultural resources consultant, 1994-present.

Instructor, history of technology, environmental history, Dept. of History and Sociology of Science, University of Pennsylvania, Philadelphia, spring semesters 2006, '07, '08, '09.

Lecturer, history of technology, Interdisciplinary Studies Program, College of Engineering, University of California at Berkeley, January 1999 to May 2001; history of American science and technology, Department of History, U.C. Berkeley, January to May 2000.

Historian, Historic American Engineering Record, U.S. Dept. of the Interior, Jeannette, PA, June to August 1991, June to September 1992.

Architectural Historian (and founder), Renewable Technologies, Inc., Butte, MT, May 1982 to August 1990.

Adjunct Assistant Professor, School of Architecture, Montana State University, Bozeman, MT, winter quarter 1983.

Instructor, Engineering Graphics, Montana College of Mineral Science and Technology, Butte, MT, January 1981 to May 1981 (spring semester).

Building Recycling Specialist, National Center for Appropriate Technology, Butte, MT, April 1977 to September 1981.

Historian, Historic American Engineering Record, U.S. Dept. of Interior, Butte, October 1979 to April 1981.

PROFESSIONAL AFFILIATIONS

Society for Industrial Archeology: president 6/96 to 6/98; vice president 6/94-6/96; past-president 6/98 to 6/00; board of directors 6/90-6/93; journal editor 2011 to present.
Capitol Advisory Council (Montana), appointed by Gov. Racicot 1/96 to 8/98.
Klepetko (Montana) Chapter, Society for Industrial Archeology, president 9/87-8/90.
Committee on Historic and Archeological Preservation in Transportation, Transportation Research Board of the Nat'l Research Council, 1/91 to 6/93.
Board of Directors, Butte-Anaconda Historical Park and Railroad Corporation, 1986-1990.
Montana Historic Preservation Review Board, 1981-1990: appointed by Governor Schwinden, 10/81; reappointed 10/85; elected chairperson, 12/87.
Montana State Capitol Restoration Advisory Panel, appointed by House Speaker John Vincent, 5/85-4/89.
Board of Directors, Butte-Silver Bow Public Archives, 1979-1986.
Society of Architectural Historians.
Society for the History of Technology.
American Society for Environmental History
History of Science Society
Western History Association
Organization of American Historians
Norwegian-American Historical Association

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"Of Tailings, Superfund Litigation, and Historians As Experts: *U.S. v. Asarco, et al*, the Bunker Hill Superfund Case in Idaho," in *The Public Historian* 26 (Winter 2004): 81-104.

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"Steel Transmission Towers & Energy for Montana's Copper Industry," Historic Landscapes feature in *Montana: The Magazine of Western History*, 38 (Fall 1988): 67-69.

"The Anaconda Company Smelters at Great Falls and Anaconda," in *The Speculator: The Journal of Butte and Southwest Montana History*, 1 (Summer 1984), expanded version of a paper given at the Annual Meeting of the Society for Industrial Archeology, St. Paul, MN, May 1983.

"Montana's Minneapolis Bridge Buildings," in *IA: The Journal of the Society for Industrial Archeology*, 10 (1984), no. 1, expanded version of a paper given at the Annual Meeting of the Society for Industrial Archeology, St. Paul, MN, May 1983.

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"Retrofitting with Passive Solar," paper published in *New Energy From Old Buildings* (Washington, D.C: The Preservation Press, 1981), and presented at the Smithsonian Institution, Washington, D.C., during National Historic Preservation Week, May 1980.

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Review of *Race and Labor in Western Copper*, by Philip J. Mellinger, in *Montana: The Magazine of Western History* 47 (Autumn 1997): 84-85.

Review of *Environmental History Review*, Spring 1994, special issue on "Technology, Pollution, and the Environment," Joel A. Tarr and Jeffrey K. Stine, eds., and *Journal of Urban History*, May 1994, special issue on "The City and the Environment," Joel A. Tarr and Christine M. Rosen, eds., in *Technology & Culture* 36 (October 1995): 1038-1041.

Review of *Water Towers* and *Gas Tanks*, by Bernd and Hilla Becher, in *Design Book Review* 35/36 (Winter/Spring 1995): 56-59.

Review of *The Texture of Industry: An Archaeological View of the Industrialization of North America* by Robert B. Gordon and Patrick M. Malone, in *Environmental History Review* 18 (Winter 1994): 102-104.

Review of *Bisbee: Urban Outpost on the Frontier*, Carlos A. Schwantes, ed., in *Technology and Culture* 35 (April 1994): 435-436.

Review of *In the Servitude of Power: Energy and Civilization through the Ages* by Jean-Claude Debeir, Jean-Paul Deleage, and Daniel Hemery, in *Environmental History Review* 17 (Summer 1993): 97-98.

Review of *The Colossus of 1812: An American Engineering Superlative* by Lee H. Nelson, in *IA: The Journal of the Society for Industrial Archeology*, 16 (1990), No. 1.

Review of *Song of the Hammer & Steel* by Duane Smith, in *IA: The Journal of the Society for Industrial Archeology*, 14 (1988), No. 1.

SCHOLARLY PRESENTATIONS

"Historians As Experts in Environmental Litigation," paper presented at the annual meeting of the American Historical Association, New Orleans, January 2013.

"A Case for the Preservation of Industrial Waste: The Historic Copper-Mining Industry of Southwest Montana," paper presented at the annual meeting of the National Trust for Historic Preservation, Buffalo, NY, October 2011, and The International Conference on the Conservation of Industrial Heritage (TICCIH), Freiberg, Germany, September 2009.

"History of Fort Peck Dam," keynote address presented at the annual meeting of the Missouri River Natural Resources Committee, March 2009.

"Addressing Global Warming by Means of History: Thinking in the Material World," presented at the Nobel Peace Prize Forum, St. Olaf College, Northfield, MN, March 2009.

"Fort Peck and Its Shanty Towns: The Corps of Engineers Couldn't Have It All," paper presented at the annual Montana History Conference, Glasgow, Montana, October 2008.

"The Industrial Heritage of Energy," paper presented at "Industrial Heritage: Premises & Practices for the 21st Century," a conference at Michigan Tech, Houghton, MI, September 2008.

"Industrial Waste As Cultural Resource," presentation made to colloquium of the Industrial Archaeology Program, Social Sciences Dept., Michigan Tech, Houghton, MI, November 2007.

"Engineering Nature: The Souris River and the Production of Migratory Waterfowl," paper presented at annual meeting of the Society for the History of Technology, Wash, DC, Oct. 2007.

"Conflict in the Realm of Medical Science: Battling Veterinarians in the Anaconda Smelter Smoke Litigation" and "Mining in the West: Overview and Health Issues," papers presented at the Seventh Annual Medical History of the West Conference, Montana State University, Bozeman, April 2007.

"Conflict along the Edges of the Living and the Non-Living Environments: Mining v. Farming in Montana's Deer Lodge Valley in the Early Twentieth Century," paper presented at the annual meeting of the American Society for Environmental History, Baton Rouge, March 2007.

Keynote Address on "Technology, Environment, and Work" at the North American Labor History Conference, Detroit, October 2006.

"The Question of Authenticity When Applied to the Preservation of Components of Complex, Large-Scale Technological Systems," paper presented at the Fifth National Forum on Historic Preservation Practice, Goucher College, March 2006.

"Inhaling a Microscopic Artifact: Asbestos Dust and the Vermiculite Mine at Libby, Montana," paper given at the annual meeting, Society for Industrial Archeology, Milwaukee, June 2005.

"Interpreting a Large Industrial Artifact: The Case of the Whirley Cranes at Kaiser's Richmond Shipyards," paper presented at the annual meeting of the Society for Industrial Archeology, Providence, June 2004.

"History As Compliment to Scientific Field Data in Superfund Litigation," presentation as part of a panel titled, "Reading the Issue: Environmental History in *The Public Historian*," at the joint annual meeting of the American Society for Environmental History and the National Council on Public History, Victoria, BC, April 2004.

"Gold & Tailings: The Standard Mill at Bodie, California," paper presented at the annual meeting of the Society for Industrial Archeology, Montreal, Quebec, May 2003.

Organizer of and participant in a scholarly panel on "The Environmental History of Mining" at the annual meeting of the Mining History Association, Wallace, ID, June 2002.

"From Slimes to Hens Eggs: Visions of Tailings in Idaho's Coeur d'Alene Mining District, 1888-2001," paper presented at the annual meeting of the Society for Industrial Archeology, Brooklyn, June 2002.

"Integrating the Preservation of Cultural Resources with Remediation of Hazardous Materials: An Assessment of Superfund's Record," paper presented at the annual meeting of the American Society for Environmental History, Tacoma, WA, April 2000.

"Physical Setting and the Shaping of Giant Smelters: A Comparison of the Great Falls and Anaconda Smelters," paper given at the annual meeting of the Society for Industrial Archeology, Savannah, GA, June 1999.

"Landscapes as Industrial Artifacts: Lessons from Environmental History," paper presented at Whither Industrial Archeology, a symposium sponsored by the Society for Industrial Archeology at Lowell National Historic Park, MA, November 1998.

"Government Intervention v. Economic Efficiency in the Abatement of Smelter Smoke Pollution: The Case of the Anaconda Smelter in the 1910s," paper given at the annual meeting of the Society for the History of Technology, Baltimore, MD, October 1998.

"Smoke and Tailings: An Environmental History of Copper Smelting Technologies in Montana, 1880-1920," public presentations based on PhD dissertation and illustrated with slides, Trinity Lutheran Church, Alameda, CA, July 2001; Environmental Studies Program, St. Olaf College,

Northfield, MN, October 1999; Colloquium of the Office for History of Science and Technology, University of California at Berkeley, April 1999; Parker Lecture Series, Lowell, MA, November 1998; Chemical Heritage Foundation, Philadelphia, October 1998; Froid Lutheran Church, Froid, MT, July 1998; Center for the Rocky Mountain West, Missoula, MT, March 1996.

"On the Nature of Tailings: An Overview of Early Attitudes Towards Tailings Disposal in the Montana Copper Industry," Montana State History Conference, Butte, MT, October 1996.

"Captain Couch of the Boston & Montana: A Self-Trained Mining Engineer and the Industrialization of Butte's Copper Mining District," paper presented at the annual meeting of the Western History Association, Denver, CO, October 1995.

"Conflict in the Science of Environmental Impact: The Anaconda Smelter Smoke Cases, 1902-1911," paper presented at the biennial meeting of the American Society for Environmental History, Las Vegas, NV, March 1995.

"Architects as Designers of Pre-World War II, Large-Scale Technological Systems: Edward W. Tanner and the Design of the Fort Peck Townsite," paper presented at session titled "Topics at the Intersection of Architectural History and the History of Technology" at the Annual Meeting of the Society of Architectural Historians, Seattle, WA, April 1995.

"The Concept of Industrial Waste: Smoke 'Nuisance' Cases in the Montana Copper Industry at the Turn of the Twentieth Century," paper presented at the annual meeting of the Society for the History of Technology, Lowell, MA, October 1994.

"Retarded Mechanization in the Connellsville Beehive Coke Industry," paper presented at the annual meeting of the Society for Industrial Archeology, Pittsburgh, PA, June 1993.

"EPA's Superfund in the Context of Other American Large-Scale Technological Systems," paper presented at the fifteenth annual meeting of the National Council on Public History, Valley Forge, PA, May 1993.

"Imposing an Industrial Order on the Northern Plains: Patterns of Truss Bridge Construction, 1880-1920," paper presented at the annual symposium of the Center for Great Plains Studies, Lincoln, NE, April 1993.

"Industrial Pollution on the Southwestern Pennsylvania Countryside: The Connellsville Beehive Coke Industry, 1880-1920," paper presented at the biennial meeting of the American Society for Environmental History, Pittsburgh, PA, March 1993. A longer version of this paper won the 1994 Newcomen Prize at the University of Pennsylvania.

"EPA Superfund: After a Decade, Why Is It Not an Effective Technological System?" paper presented at the annual meeting of the Society for the History of Technology, Madison, Wisconsin, October 1991.

"A Comparison of the U.S. Bureau of Reclamation's Cylinder-Gate and Ring-Gate Designs for Spillway Controls," paper presented at the 20th Annual Meeting of the Society for Industrial Archeology, Chicago, June 1991.

"Contribution of Railroads to Montana's Historic Bridge Landscape," presentation at the Montana History Conference, Livingston, MT, October 1988.

"Power for the Copper Industry: Hydroelectric Developments Along the Great Falls of the Missouri River, 1890-1957," paper given at the 17th Annual Meeting of the Society for Industrial Archeology, Wheeling, WV, May 1988.

"Historical Differences Between Hardrock Mining and Underground Coal Mining," presentation at the Montana History Conference, Helena, MT, October 1987.

"Industrial Urbanism on the Wheat Frontier: Minot, North Dakota, 1886-1929," paper given at the 15th Annual Meeting of the Society of Industrial Archeology, Cleveland, OH, June 1986.

"Appropriate Technologies and Historic Preservation," paper given at the International Conference on the Conservation of Industrial Heritage (TICCIH), Lowell, MA, June 1984.

"Maintenance and Stabilization of Historic Bridges," paper given at the Annual Meeting of the Association for Preservation Technology, Banff, Alberta, October 1982.

"The Great Falls Smelter: Some Reflections on Its Significance," paper given at the Montana State History Conference, Great Falls, MT, October 1982.

"Superinsulation vs. Passive Solar Energy in Historic Buildings," paper given at the Annual Meeting of the Association for Preservation Technology, Washington, D.C., October 1981.

"Passive Solar Retrofit of Historic Structures," paper given at the Annual Meeting of the Association for Preservation Technology, Denver, CO, September 1979.

SCHOLARLY and RELATED ACTIVITIES

Editor, *IA: the Journal of the Society for Industrial Archeology*, responsible for soliciting authors to submit manuscripts, arranging peer reviewers for manuscripts, making decisions about articles to publish, organizing special issues and working with guest editors, January 2011 to present.

Instructor for "Richest Hills" workshops, two week-long workshops on the history of Western mining for teachers sponsored by the Montana Historical Society and funded by the National Endowment for the Humanities; focus of instruction was on history of environmental impacts by industrial mining at Butte, and the cultural landscapes of the mining industry at Butte and Anaconda, July 2013 and July 2011.

Served as peer reviewer for articles submitted to the following scholarly journals: *BC Studies; Environmental History; IA: the Journal of the Society for Industrial Archeology; Montana: the Magazine of Western History; Technology & Culture; The Annals of Science; Health & History.*

Served as peer reviewer for book manuscripts for the University of Washington Press, the University of Tennessee Press, and the Montana Historical Society Press.

Served as a reviewer for grant proposals submitted to the National Science Foundation.

Chair of the Program Committee for the annual meeting of the Society for Industrial Archeology, Philadelphia, PA, June 2007; and Duluth, MN, June 2000.

Panel organizer, "Defining Environmental Edges to Anaconda's Global Mining Enterprise," panel of three papers presented at the annual meeting of the American Society for Environmental History, Baton Rouge, March 2007.

Panel organizer, "Emergency Shipyards during World War II in the San Francisco Bay Area," panel of three papers presented at the annual meeting of the Society for Industrial Archeology, Providence, June 2004.

Co-organizer with Brian Shovers, Fall Tour of industrial and engineering sites in NE Montana, organized by the Klepetko (Montana) Chapter for the Society for Industrial Archeology, September 2003.

Panel organizer, "A Roundtable on the Environmental History of Mining," panel of three papers presented at the annual meeting of the Mining History Association, Wallace, ID, June 2002.

Panel organizer, "Tailings As Cultural Artifact," panel of three papers presented at the annual meeting of the Society for Industrial Archeology, Brooklyn, June 2002.

Chair of the Program Committee, "Whither Industrial Archeology," a three-day symposium at Lowell, MA, featuring twenty-four speakers and co-sponsored by the Society for Industrial Archeology, Historic American Engineering Record, and Lowell National Historic Park, November 1998.

Panel organizer, "Topics at the Intersection of Architectural History and the History of Technology," a two-session panel featuring seven papers and a comment, presented at the Annual Meeting of the Society of Architectural Historians, Seattle, WA, April 1995.

Organizer, Coal and Coke Tour, organized for the Annual Meeting of the Society for Industrial Archeology, Pittsburgh, PA, June 1993.

Co-organizer with Brian Shovers, Fall Tour of Butte and Anaconda, Montana, organized by the Klepetko (Montana) Chapter for the Society for Industrial Archeology, October 1989.

Co-organizer with Brian Shovers, "Butte: The Urban Frontier," three-day history conference featuring twenty-six speakers and sponsored by the Butte Historical Society with major funding by the Montana Committee for the Humanities, Butte, MT, September 1982.

Project Director, Historic and Architectural Survey of over 3,000 structures in the Butte National Historic Landmark District, sponsored by the Butte Historical Society with major funding from the Montana State Historic Preservation Office and the Butte-Silver Bow Community Development Office, 1981-1985.

ORAL HISTORIES

Organized and conducted an oral history project as part of the research for an Expert Report for the U.S. Dept. of Justice in *U.S. v. Asarco, et al*; recorded 12 oral histories in communities in the Coeur d'Alene mining district, ID, December 2005 and April 2006.

Organized and conducted, in cooperation with the oral historian at the Montana Historical Society, the Libby Oral History Project as part of the research for an Expert Report for the U.S. Dept. of Justice in *U.S. v. W.R. Grace*; recorded 32 oral histories, April-June 2002.

Oral histories with three former shipyard workers, conducted in conjunction with research for the history of the Kaiser shipyards in Richmond, CA, being prepared for the Historic American Engineering Record.

Oral history of Guy Harris, retired chemist at Dow who developed and patented Z200, an important reagent used in the flotation of copper ores; Regional Oral History Office, Bancroft Library, University of California at Berkeley, 2001.

Oral histories with Joe & Carol Gwerder, farmers in California's Delta Region who spent their lives engaged in irrigated agriculture; Regional Oral History Office, Bancroft Library, University of California at Berkeley, 2001.

The Morrissey Oral History Workshop, training by Charles Morrissey during a three-day workshop at Fort Mason Center, San Francisco, March 2000.

Oral histories of thirteen early members of a rural electric co-op recalling the impacts of rural electrification on farm life in northeast Montana; sponsored by Sheridan Electric Co-op, 1997.

SELECT CONTRACT PUBLICATIONS AND PRESENTATIONS

"History of Federal Resources Corporation's Activities at the Conjecture Mine," expert report dated 18 April 2013, prepared for Lybeck Murphy on behalf of the defendant in *U.S. v. Federal Resources Corporation* in the Conjecture Mine Superfund litigation in Idaho. The report provides expert opinions concerning the history of operations at the Conjecture mine, including those of Federal Resources as well as those of previous owners of the property.

"History of Opportunity, Montana, and Its Environment," expert report dated 12 April 2013, prepared for Lewis, Slovak, & Kovacich on behalf of the plaintiffs in *Gregory A. Christian, et al, v. BP Amoco Corporation, et al*, in Montana District Court for Silver Bow County. The report provides expert opinions concerning the history of the Anaconda Copper Mining Company's practices of discharging pollutants into the Opportunity environment and of the company's knowledge that it was doing so.

"Silver Bow Creek," expert report dated 15 October 2012, prepared for Goetz, Baldwin, and Geddes on behalf of the plaintiffs in *Silver Bow Creek Headwaters Coalition v. State of Montana*, in

Montana District Court for Silver Bow County. The report provides expert opinions concerning the history of the name of an upper reach of Silver Creek, located within a portion of Butte undergoing Superfund remediation.

"Tailings Contributions of Golconda Lead Mines, Inc.," expert report dated September 2011, prepared for the Environmental Enforcement Section, U.S. Department of Justice, in *U.S. v. Marmon Holdings*, a subsidiary case in the Bunker Hill Superfund litigation in Idaho. The report details the discharge of tailings by the Golconda mill during its years of operation.

"Lava Cap Mine," expert report dated January 2011, prepared for the Environmental Enforcement Section, U.S. Department of Justice, in *U.S. v. Sterling Centrecorp*, the Lava Cap Mine Superfund case in California. The report details the history of the management relationship between Sterling and its subsidiary, Keystone Copper, which operated the Lava Cap mine.

"History of Mining, Milling, and Smelting in NE Washington," November 2010, prepared for Teck Metals Ltd in Joseph A. Pakootas, et al v. Teck Cominco Metals, Ltd. The report details the histories of several mining and milling operations in northeast Washington which discharged tailings and other contaminants to the environment of the Upper Columbia River in the U.S.

"Mining on State Lands in NE Washington," September 2010, prepared for Teck Metals Ltd in Joseph A. Pakootas, et al v. Teck Cominco Metals, Ltd. The report details the histories of several mining and milling operations in northeast Washington which operated on State lands and discharged tailings to the environment of the Upper Columbia River in the U.S.

"History of Potential Sources of the LNAPL Contamination beneath the Former DSCP Site in South Philadelphia," February 2010, prepared for the Environmental Enforcement Section, U.S. Department of Justice, and the Defense Logistics Agency in *U.S. v. Sunoco, et al*, sub-contract to Stratus Consulting, Boulder, CO. The report details the histories of the Defense Supply Center Philadelphia (DSCP), Sunoco's Point Breeze Refinery, and several smaller industrial operations for the purpose of showing that the LNAPL contamination had is historic source at the refinery and could not historically have had its source at DSCP other any of the smaller operations.

"Expert Report," November 2006, prepared for the Environmental Enforcement Section, U.S. Department of Justice, in the Midnite Mine (WA) Superfund litigation (*U.S. v. Newmont USA Limited, et al*). The report details the history of the management relationship between Newmont and its subsidiary, Dawn Mining Company, which operated the Midnite mine.

"Expert Report," October 2006, prepared for the Coeur d'Alene Tribe of Indians in support of a mediation hearing intended to resolve differences between the Tribe and Avista, (formerly Washington Water Power) concerning compensation Avista owes the Tribe for having inundated portions of the Coeur d'Alene Indian Reservation as a consequence of the construction of the Post Falls dam, which allows Avista to utilize the lake to provide annual storage for a system of hydroelectric generating stations along the Spokane River.

Testimony before a mediator on behalf of the U.S. Attorney's Office for the Eastern District of New York in the case *TDY Holdings, Inc., v. United States* concerning allocation of costs for the Superfund remediation of the Li Tungsten site at Glen Cove, New York. Testimony concerned

history of operations at the Wah Chang tungsten refinery, corporate history associated with the operation, and the history of the federal government's involvement in the operations during the World War II years; January 2005.

"Synthesis Report," a report written under contract to the Historic American Engineering Record for the Rosie the Riveter/World War II Home Front National Historical Park (RORI), Richmond, CA, and synthesizing more than a dozen reports prepared for RORI on physical resources in Richmond dating from the WWII period, on historic sites in the San Francisco Bay Area relating America's WWII mobilization, and on historical themes reflecting Americans' experiences on the home front during the war, December 2004.

"The Kaiser Shipyards," business and technological history of Kaiser's Richmond shipyards, written under contract to the Historic American Engineering Record for the Rosie the Riveter/World War II Home Front National Historical Park, Richmond, CA, July 2004.

"The Ford Motor Company Assembly Plant," business and technological history of the Ford Assembly Plant in Richmond, CA, a.k.a. the Richmond Tank Depot, written under contract to the Historic American Engineering Record for the Rosie the Riveter/World War II Home Front National Historical Park, Richmond, CA, September 2003.

"Phase II Expert Rebuttal Report," January 2003, prepared for the firm Beshears Muchmore Wallwork, representing two of the plaintiffs (Phelps Dodge Miami, Inc., and Inspiration Consolidated Copper Company) in the Superfund litigation *Pinal Creek Group v. Newmont Mining Corporation, et al.* The report presents my expert opinions concerning the economic integration of mining companies operating in the Globe/Miami district of Arizona.

"Expert Report," July 2002, prepared for the Environmental Enforcement Section, U.S. Dept. of Justice, in *U.S. v. W.R. Grace*, the Libby, MT, Superfund case. The report describes the mining and mineral processing history of the W.R. Grace/Zonolite vermiculite operation at Libby.

"Second Supplemental Expert Report," July 2002, prepared for the firm Beshears Muchmore Wallwork, representing the plaintiffs in the Superfund litigation *Pinal Creek Group v. Newmont Mining Corporation, et al.* The report provides additional historical details concerning the corporate relationship between the Inspiration Consolidated Copper Company and the Anaconda Copper Mining Company.

"Supplemental Expert Report," January 2002, prepared for the firm Beshears Muchmore Wallwork, representing the plaintiffs in the Superfund litigation *Pinal Creek Group v. Newmont Mining Corporation, et al.* The report provides additional historical details concerning the corporate relationship between the Inspiration Consolidated Copper Company and the Anaconda Copper Mining Company.

"History and Heritage of Civil Engineering," historian of technology for developing an interactive web site (www.asce.org/history/) mounted in commemoration of the sesquicentennial of the American Society of Civil Engineers (ASCE); sub-contract to Convey, Inc., October 2001.

"Determination of Eligibility for the Contra Costa Power Plant," Antioch, CA, prepared under contract to URS-Dames & Moore for Southern Energy, Oct. 2000.

"The Standard Mill at Bodie, CA," narrative history written under contract to the Historic American Engineering Record for California State Parks, Sept. 2000.

"Expert Report," March 2000, prepared for the Environmental Defense Section, U.S. Dept. of Justice, in the Stibnite/Yellow Pine Superfund litigation (*Mobil Oil Corp. v. U.S.*) in Idaho. The report describes the tailings-disposal methods used by the Bradley Mining Company, 1932-1952.

"Expert Report," February 2000, prepared for the firm Muchmore & Wallwork, representing the plaintiffs in the Superfund litigation *Pinal Creek Group v. Newmont Mining Corporation, et al.* The report is a corporate and operational history of the Inspiration Consolidated Copper Company in the context of the corporate and operational history of the Anaconda Copper Mining Co., which owned a minority share of Inspiration stock but controlled the Inspiration operations.

"Expert Report," August 1999, prepared for the Environmental Enforcement Section, U.S. Department of Justice, in the Bunker Hill (ID) Superfund litigation (*U.S. v. ASARCO, et al*). The report includes technological and business histories of the lead-silver concentrators operating in the Coeur d'Alene mining district and a history of the movement of tailings and other contaminants through the Coeur d'Alene River system.

"Expert Report," August 1997, prepared for the Environmental Enforcement Section, U.S. Department of Justice, in the Clark Fork (MT) Superfund litigation (*U.S. v. ARCO*). The report includes technological histories of the silver mills, copper smelters, zinc concentrators, and manganese plant at Butte and Anaconda, Montana, as well as histories of the Anaconda Smelter Smoke Commission and a series of land exchanges affected by the Anaconda Copper Mining Company and the U.S. Forest Service.

"The Anaconda Smelter Smoke Commission: A Technological History," May 1997, Expert Report prepared for the Environmental Defense Section, U.S. Department of Justice, in the Clark Fork (MT) Superfund litigation (*U.S. v. ARCO*). In addition to a history of the Smoke Commission, the report includes a technological and pollution history of the Anaconda Copper Mining Company's smelters at Anaconda.

"Sheridan Electric Co-op: A History of Its Organizing," a history written to commemorate Sheridan Electric's 50th annual membership meeting, October 1997. The project is accompanied by the recording of about a dozen oral histories of early co-op members recalling the impacts of rural electrification on farm life in northeast Montana.

"Connellsville Coal and Coke Study," a business and technological history of the Connellsville Coke Region for the America's Industrial Heritage Project, Historic American Engineering Record (HAER), National Park Service, September 1992. Transmitted to the Library of Congress as "Connellsville Coal & Coke Region, HAER No. PA-283," the historical narrative accompanying HAER measured drawings of beehive coke ovens in the region, 1995.

"Selby Avenue Bridge, HAER No. MN-61," Historic American Engineering Record narrative and large format photographs, sub-contract to Robert M. Frame III for the Department of Public Works, St. Paul, MN, September 1992.

"Historic Bridges in North Dakota," statewide survey and determination of eligibility, with Lon Johnson (RTI), Mark Hufstetler (RTI), and Charlene Roise, contract to North Dakota State Department of Transportation, May 1992.

"Deer Flat Embankments, HAER No. ID-17-B," with Amy Slaton (RTI), Historic American Engineering Record narrative history, contract to Pacific Northwest Region, U.S. Bureau of Reclamation, December 1991.

"Owyhee Dam, HAER No. OR-17," with Amy Slaton (RTI), Historic American Engineering Record narrative history, contract to Pacific Northwest Region, U.S. Bureau of Reclamation, September 1991.

"Boise Project Office, HAER No. ID-17-C," (RTI) Historic American Engineering Record history, contract to Pacific Northwest Region, U.S. Bureau of Reclamation, September 1990.

"Dams of the Upper Souris National Wildlife Refuge, HAER No. ND-3" and "Dams of the J. Clark Salyer National Wildlife Refuge, HAER No. ND-4," with Mary McCormick (RTI), Historic American Engineering Record narrative history & large-format photography, contract to St. Paul District U.S. Army Corps of Engineers for U.S. Fish and Wildlife Service, August 1990.

Exhibit 37

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2014-XXXX

ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE

WALKER MINE TAILINGS
PLUMAS COUNTY

CLEANUP AND ABATEMENT ORDER NO. R5-2014-YYYY

ATLANTIC RICHFIELD COMPANY

WALKER MINE
PLUMAS COUNTY

PROSECUTION TEAM'S REBUTTAL BRIEF

TABLE OF CONTENTS

I. Introduction

This brief provides the Prosecution Team's rebuttal to the Forest Service's 20 February 2014 Response (Response) and to Atlantic Richfield's (ARCO's) 21 February 2014 Prehearing Brief (ARCO Brief). The Forest Service and ARCO are collectively referred to as Dischargers.

II. Rebuttal to the Forest Service's Response

a. Summary

The Forest Service did not put the mine waste on the Tailings site, ARCO's predecessors did. But the Forest Service authorized the use of the site for tailings disposal, it owns and operates the site, and it discharges waste in violation of WDR Order No. R5-00-028. The Forest Service is properly named to the Tailings CAO.

The Central Valley Water Board has jurisdiction over the Forest Service for waste discharges from the Tailings, despite what the Forest Service argues in its Response. The Forest Service has been willingly subject to the Board's authority for decades, before and after commencement of the CERCLA action at the Tailings site, without any objection until now. Notably, the Forest Service accepted Order R5-00-028 well after the initial CERCLA Record of Decision (ROD) for the Tailings site, and immediately prior to adopting the amended ROD. Order R5-00-028 required the Forest Service to comply with specific Receiving Water Limitations no later than 1 October 2008. Despite some remedial efforts under the ROD, the Forest Service still has not complied.

It is long past time for the Forest Service to comply with Order R5-00-028. The Tailings CAO is consistent with the ongoing CERCLA process, and it is not a challenge or impairment to the CERCLA process in any way. The Forest Service and ARCO presumably will work together to bring the discharges from the Tailings into compliance with the Receiving Water Limitations, which will only enhance any CERCLA actions.

b. The Clean Water Act's waiver of sovereign immunity allows injunctive orders such as the Tailings CAO against the Forest Service

The Forest Service disputes the Board's authority and dramatically misstates the Clean Water Act's waiver of federal sovereign immunity on pages 3-6 of its Response. The Clean Water Act's sovereign immunity waiver is codified at 33 U.S.C section 1323, subdivision (a), and provides that

> Each department, agency, or instrumentality of the ... Federal Government ... shall be subject to, and comply with, all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution in the same

> manner ... as any nongovernmental entity.... The preceding sentence shall apply (A) to any requirement whether substantive or procedural (including any recordkeeping or reporting requirement, any requirement respecting permits and any other requirement, whatsoever), (B) to the exercise of any Federal, State or local administrative authority, and (C) to any process and sanction, whether enforced in Federal, State, or local courts or in any other manner.... [Emphasis added.]

It is beyond reasonable dispute that the Forest Service must comply with California's water quality permitting authority regarding discharges of waste from the Tailings.

The United States Supreme Court has interpreted the sovereign immunity waiver only to prohibit punitive civil fines for past water quality violations. (*United States Department of Energy (DOE) v. Ohio* (1992) 503 U.S. 607, 622-624.) In fact, the *DOE* federal agency conceded that states have authority to issue permits and injunctive orders and coercive fines against federal agencies to protect water quality. (*Id.* at 613.)

The Tailings CAO is an injunctive order requiring the Forest Service to take steps to cleanup and abate unlawful discharges from the Tailings, and is well within the meaning of "any process and sanction" to which the Forest Service "shall be subject" under 33 U.S.C. section 1323, subdivision (a).

The Forest Service's attempt to evade Board jurisdiction here is perhaps explained by the 2005 Consent Decree between it and ARCO regarding the Tailings (PT Exhibit 12). In that Decree, the Forest Service apparently agreed to indemnify ARCO for costs and damages relating to claims including, perhaps, the Tailings CAO. (*Id.*, at pp. 14-15, ¶ 19.) Although the Consent Decree does not affect the Board's ability to bring the Tailings CAO against ARCO (*id.*, at p. 14, ¶ 18), the indemnification provision does suggest that the Forest Service would be required to pay any punitive fines issued to ARCO for failure to comply with the Tailings CAO.[1] While the Board must now presume that the Dischargers will comply with the Tailings CAO, the relationship established by the Consent Decree suggests that the Board's ability to enforce the Tailings CAO is not as limited as the Forest Service would like.

c. The Walker Tailings remains a significant source of waste to Dolly Creek and Little Grizzly Creek

WDR Order R5-00-028 requires that the Forest Service comply with all Receiving Water Limitations by 1 October 2008. (PT Exhibit 9, at p. 8.) The applicable Receiving Water Limitation for copper in Order No. R5-00-028 is 5.0 µg/l.[2] (PT Exhibit 9, at p. 5.) Despite

[1] The Prosecution Team does not concede or even suggest that the Forest Service must necessarily indemnify ARCO, but the relationship between ARCO and the Forest Service is not for the Board to decide, so it is necessary to name them both to the Tailings CAO.

[2] The Receiving Water Limitations are exactly the type of objective standard applicable to the Federal government contemplated in *EPA v. California ex rel. State Water Resources Control Board* (1976) 426 U.S. 200, 215 n. 28.

having taken some action under the CERCLA ROD, the Forest Service is regularly out of compliance with the Receiving Water Limitations (see, e.g., PT Exhibits 24-46) and threatens to continue to remain out of compliance.

The Forest Service asserts that the Dolly Creek Diversion Channel and the USFS Dam do not discharge waste from the Tailings into Dolly Creek and Little Grizzly Creek. (Forest Service Response, at pp. 14-15.) The evidence shows otherwise. Board staff conducts twice-yearly site visits to collect water quality samples and visually observe the Tailings. (PT Exhibit 3, ¶¶ 2-4.) The water quality samples indicate that the Tailings site regularly adds copper to Dolly Creek and Little Grizzly Creek. (PT Exh 51, at ¶¶ 2-4; see also Tailings CAO, Figures 1-2.)

Despite the Forest Service's assertions, the Dolly Creek Diversion Channel has not eliminated flows through the original Dolly Creek channel and over the USFS Dam. (See PT Exh 51, ¶ 3, and PT Exhibit 52, Photograph 6.[3]) The old Dolly Creek channel is unlined and water regularly flows through mine waste for several thousand feet before discharging over the dam. (*Id.*, see also Tailings CAO, Attachment C.) Discharges over the USFS Dam continue to violate Receiving Water Limitations even after the Diversion Channel was installed. (Tailings CAO, Figure 2 [WM-6 is the USFS Dam sampling site].) The Forest Service itself regularly collects water quality samples from the USFS Dam flows. (PT Exh 51, at ¶ 4.)

The Dolly Creek Diversion Channel itself picks up waste from the Tailings through wind-borne dust and perhaps other vectors, and discharges from the Channel Outfall to Little Grizzly Creek regularly violate the Receiving Water Limitations. Prosecution Team Exhibit 43 (Photos 23 and 24) shows wind-borne dust at the Tailings in June 2013. That dust enters Dolly Creek and Little Grizzly Creek. (PT Exhibit 43, Photos 26 and 27 [showing fine tailings in the Dolly Creek Diversion Channel and Outfall to Little Grizzly Creek].) Despite the Forest Service's attempts to install wind rows, wind-blown dust is a regular occurrence at the Tailings. (See PT Exhibit 51, at ¶ 2, and PT Exhibit 52, Photographs 1-5 [showing wind-blown dust in 2010].)

The Forest Service's actions to date have not halted unlawful discharges from the Tailings, and those discharges will likely continue absent the Tailings CAO. In addition, the Dolly Creek Diversion Channel Outfall and probably the USFS Dam are point sources likely subject to the Clean Water Act and the Water Code. Order No. 5-00-028 was issued before construction of the Diversion Channel Outfall, and thus does not propose NPDES permit coverage for the Outfall. Given that the Outfall and the Dam regularly discharge waste to Little Grizzly Creek, Board staff will examine the possibility of including NPDES coverage in the next round of waste discharge permitting.

[3] Exhibit 52 includes photographic evidence directly rebutting the Forest Service's assertions that the Tailings and the USFS Dam do not discharge waste to Dolly Creek. Exhibit 51 is the Supplemental Declaration of Jeff Huggins authenticating the photographs.

d. The Forest Service cannot challenge Order No. R5-00-028

The Forest Service's denies that the Board has ever had regulatory authority over it at the Tailings, despite decades of Board waste discharge requirements (see, e.g., Orders R5-86-073 and R5-01-017). Contrary to its assertions in the Response, the Forest Service has not objected to Board regulation until this proceeding. The record indicates that the Forest Service has been willingly subject to the Board's authority even after the CERCLA process had been well underway. (See PT Exhibit 10.) The Forest Service cannot challenge Order No. R5-00-028.

e. The Tailings CAO is not a challenge to the CERCLA action

The Forest Service's Response largely retreads prior arguments that the Tailings CAO is a challenge to the CERCLA process at the Tailings, and continues to rely on distinguishable court cases. (Response, at pp. 7-15.) The Prosecution Team's Opening Brief (at pages 6-9) describes how CERCLA does not preempt the Board's Water Code authority. That discussion need not be repeated here except to address the Forest Service's new CERCLA arguments.

The Forest Service completely ignores the reservations of authority to the State set forth in CERCLA Sections 114(a), 302(d), 120(a)(4) and 121(e)(4). In addition, the Forest Services' cited cases all address only circumstances where third party groups have filed citizen suits in federal court challenging CERCLA actions.[4] Those cases clearly involve challenges to CERCLA actions, but that is not what is happening here.

It is hard to imagine a set of facts more squarely on point than those in *United States v. Colorado* (10th Cir. 1993) 990 F.2d 1565, which the Forest Service gives short shrift. There, a Colorado agency issued a compliance order to the Army for a site that was subject to the State's regulation under EPA-delegated RCRA authority, and the court held that such an action is not a challenge to the CERCLA response. (990 F.2d at 1575.) The Tailings site is subject to the Board's regulation under EPA-delegated Clean Water Act authority and under the Clean Water Act's general waiver of sovereign immunity. As in *Colorado*, the Tailings CAO is an injunctive order requiring the Forest Service to comply with State and federally-delegated law.

The *United States v. Colorado* court took pains to assess whether the State's compliance order sought to halt the federal agency's CERCLA action. The court found that the compliance order sought to ensure the federal agency's compliance with State law during the course of the CERCLA action, "[t]hus, Colorado is not seeking to delay

[4] Notably *McClellan Ecological Seepage Situation v. Perry* (9th Cir. 1995) 47 F.3d 325, *Sheo Homes Limited Partnership v. United States* (N.D. Cal. 2005) 397 F.Supp.2d 1194 and *Ford Ord Toxics Project, Inc. v. California Environmental Protection Agency* (9th Cir. 2000) 189 F.3d. 828. The Prosecution Team discusses these cases on pages 7 and 8 of the Opening Brief. The Forest Service still conveniently ignores the fact that *Sheo Homes* involved a federally-operated CERCLA site where the federal agency had been willingly subject to both San Francisco Bay Regional Water Board permits and cleanup and abatement orders. (PT Exhibit 47.)

the cleanup, but merely seeking to ensure that the cleanup is in accordance with state laws which the EPA has authorized Colorado to enforce.... In light of [CERCLA Sections 302(d) and 114(a)], which expressly preserve a state's authority to take such action, we cannot say that Colorado's efforts to enforce its EPA-delegated RCRA authority is a challenge to the Army's undergoing CERCLA response action." (*Id.* at 1576.) "While we do not doubt that Colorado's enforcement of the final amended compliance order will 'impact the implementation' of the Army's CERCLA response action, we do not believe that this alone is enough to constitute a challenge to the action as contemplated under [Section 113(h)]." (*Id.* at 1577.)

Like the Colorado compliance order, the Tailings CAO here does not seek to delay the cleanup at the Tailings. The Tailings CAO seeks to ensure that the Forest Service complies with the Water Code and EPA-delegated Clean Water Act authority, particularly the specific Receiving Water Limitations in WDR Order 5-00-028. While the Forest Service's compliance with the Tailings CAO will undoubtedly impact the CERCLA response action to some extent, it is difficult to see how requiring the Forest Service to comply with the Water Code will impair the CERCLA action in any way. In this way, the Tailings CAO is consistent with the CERCLA action at the site.

f. The Board should reject the Forest Service's suggestion to ignore the ongoing Water Code violations

The Forest Service suggests, astoundingly, that the Board should ignore the ongoing Water Code violations. (Response, at pp. 15-20.) The Forest Service's arguments are preposterous and without merit. The Forest Service is a responsible party because it authorized the use of the site as a tailings pond, it owns and controls and operates the site now, and it knowingly discharges waste in violation of the specific numeric Receiving Water Limitations set forth in Order No. R5-00-028. CERCLA does not preempt the Clean Water Act, and Congress has ensured that the Forest Service is subject to the Board's Clean Water Act authority.[5]

The Forest Service then suggests, on pages 20-22 of its Response, that it is not a responsible party because the mine waste at the Tailings is personal property, presumably belonging to ARCO. This assertion can be dismissed because the Forest Service operates the USFS Dam and the Dolly Creek Diversion Outfall, and has incorporated Order R5-00-028 into the CERCLA ROD. This degree of ownership and control is more than sufficient to trigger liability under Water code section 13304. Moreover, the 2005 Consent Decree raises the question whether the Forest Service has assumed some of ARCO's responsibility for the site, such that the Forest Service and ARCO both must be named to the Tailings CAO.

[5] The CERCLA defenses described on page 16 of the Forest Service's response do not apply here because the USFS is itself conducting the remedial action and knowingly discharges waste offsite into waters of the State and waters of the United States.

III. Rebuttal to ARCO's Prehearing Brief

a. Summary

ARCO's predecessors, Anaconda Copper Company (Anaconda) and International Smelting and Refining Company (International) managed, directed and conducted mine development and operations and other activities at the Walker Mine facility which are directly related to the present conditions of pollution and nuisance at the Mine and Tailings sites. ARCO is properly named to the Mine and Tailings CAOs.

In an attempt to distract from its liability, ARCO makes a number of misguided legal and factual arguments. ARCO first asserts that the wrong legal standard applies to cleanup and abatement orders, when every authority holds that the Board's findings on the proposed CAOs must be supported by substantial evidence in the record. ARCO then makes a series of arguments about Anaconda and International's corporate oversight and management of the Walker Mining Company. These arguments can be ignored because the true inquiry here is whether Anaconda and International operated, managed and directed pollution-causing activities the Walker Mine *facility* (which includes the Mine and Tailings sites). Some of ARCO's evidence supports the Prosecution Team's proposed findings. Finally, ARCO continues to argue for allocation of liability where no basis for apportionment exists.

ARCO has long opposed any efforts by the Board to impose liability for the Walker Mine and Tailings. But the Board's staff has done a remarkable job recently in investigating historical records and building a strong record showing that ARCO is liable for the actions of its predecessors. It is well past time for ARCO to assume responsibility for the mining waste and to cleanup and abate the condition of pollution and nuisance and the unlawful discharges from the Walker Mine and Tailings.

b. Regarding ARCO's prehearing motions

ARCO submitted nine prehearing motions, seeking a wide range of legal rulings. (Prehearing Motions Nos. 1 through 9.) The Prosecution Team submitted Responses to each motion, and anticipates that at least some of the motions will be addressed in prehearing rulings. In the event that any of the issues are left for hearing, the Prosecution Team incorporates each Response fully here by reference.

c. The Board's findings on the proposed Mine and Tailings CAOs must be supported by "substantial evidence in the record"

ARCO argues that the Prosecution Team must prove the elements required to support the CAOs by a "preponderance of evidence." (ARCO Brief, at pp. 8-9.[6]). ARCO's point

[6] ARCO makes the same argument in its Prehearing Motion No. 6, and the Prosecution Team's Response to that motion is incorporated by reference here.

seems to be to try to hold the Prosecution Team to a higher legal standard than that necessary to support the Board's findings, or maybe ARCO just wants to cause confusion.

State Water Resources Control Board (State Water Board) precedents clearly hold that the Central Valley Water Board's findings in orders under Water Code section 13304 must be supported by "substantial evidence in the record" and not a "preponderance of evidence." (See *Exxon Company, USA*, Order No. WQ 85-7, at p. 6; *Stinnes-Western Chemical Corp.*, Order No. 86-16, *Aluminum Company of America*, Order No. WQ 93-9; *In re: Sanmina Corp.*, Order No. WQ-93-14.)

Substantial evidence means "credible and reasonable evidence." (*In re: Sanmina Corp*, Order No. WQ 93-14.) "Substantial evidence does not mean proof beyond a doubt or even a preponderance of evidence. Substantial evidence is evidence upon which a reasoned decision may be based." (*In re: Robert S. Taylor, et al. and John F. Bosta, et al.*, Order No. WQ 92-14, at p. 5; see *Friends of Davis v. City of Davis* (2000) 83 Cal.App.4th 1004, 1019 ["Substantial evidence" means facts, reasonable assumptions based on facts and expert opinions supported by facts.].) Staff opinion can be substantial evidence. (*Browning-Ferris Industries v. City Council* (1986) 181 Cal.App.3d 852, 866 [internal citation omitted].) Substantial evidence can also be direct or circumstantial evidence of historical activities from public records or other sources. (State Water Board Resolution 92-49, at § I.A.1.)

In its attempt to confuse the issue, ARCO does not even define what "preponderance of the evidence" means. "Preponderance of evidence usually means that one body of evidence has more convincing force than the evidence opposed to it." (Cal. Admin. Hearing Practice, 2d Ed., § 7.51 [internal citations omitted]; see also BAJI No. 2.60; *People v. Miller* (1916) 171 Cal. 649, 652-653 ["'preponderance of evidence' [means] such evidence as, when weighed with that opposed to it, has more convincing force, and from which it results that the greater probability is in favor of the party upon whom the burden rests."].) "The sole focus of the legal definition of 'preponderance' in the phrase 'preponderance of the evidence' is on the *quality* of the evidence. The *quantity* of evidence presented by each side is irrelevant." (*Glage v Hawes Firearms Co.* (1990) 226 Cal.App.3d 314, 324-325 [italics in original].)

ARCO's claim that a higher legal standard applies to the Prosecution Team is a fallacy because the Board makes express or implied determinations regarding the quality and convincing force of evidence each time it adopts findings in an Order. The parties in any contested proceeding usually submit contrary evidence. The Board hears the evidence, determines what evidence is credible and reasonable, and adopts findings accordingly. The Board may choose to make an express determination that the evidence in support of any finding is of more convincing force than the evidence in opposition, but such a determination is always at least implied.

In other words, the Board determines with each finding which party has proved its claim by a preponderance of the evidence. The Board's determination regarding the convincing force or persuasiveness of any evidence is not subject to appeal. The Prosecution Team is not held to any artificially high standard.

d. The Prosecution Team's evidence is substantial and persuasive

ARCO's misconceptions about the applicable standard so thoroughly permeate and confuse the rest of their arguments that is necessary to briefly reiterate the applicable law and evidence. The Mine CAO and Tailings CAO arise under Water Code sections 13304 and 13267. Section 13304 requires that the Board find substantial evidence that a discharger (1) causes or permits, or threatens to cause or permit, (2) a discharge of waste that is or probably will be discharged into waters of the State, and (3) creates, or threatens to create, pollution or nuisance. (Water Code § 13304, subd. (a).) Section 13267 requires that the Board find substantial evidence that a person has discharged, discharges, or is suspected of having discharged or discharging waste, or who proposes to discharge waste within its region. (Water Code § 13267, subd. (b)(1).)

The Prosecution Team has submitted substantial evidence in the form of staff reports and water quality sample analyses demonstrating that the Mine and Tailings sites are discharging waste and threatening to discharge waste in violation of Order R5-00-028 (for the Forest Service at the Tailings) and in violation of Basin Plan prohibitions and creating a condition of pollution or nuisance (for ARCO at both sites).[7] (PT Exhibits 3, 24-46.) ARCO has not submitted any evidence to counter the staff reports and water quality sample analyses (in fact some of ARCO's' evidence is harmonious), nor has ARCO submitted any evidence to generally show that the ongoing and threatened discharges from the Mine and Tailings sites are lawful.

The Prosecution Team has submitted substantial evidence that the current conditions of discharge and threatened discharge were caused primarily by ARCO's predecessors, Anaconda and International, who directed, operated, managed or controlled pollution causing activities at the Walker Mine facility between approximately 1918 and 1941. This evidence includes numerous archive documents from the Anaconda Geological Collection and elsewhere demonstrating, directly and circumstantially, that Anaconda and International directly operated and managed the Walker Mine facility alongside the Walker Mining Company. (PT Exh 1 and complete University of Wyoming Documents and Montana Historical Society documents submitted electronically by reference).

The Prosecution Team has also submitted the expert witness statement and testimony of Dr. Fredric Quivik, who reviewed the archive documents and concluded that "Anaconda's top managers in the areas of geology, mining, and metallurgy directed

[7] Although the Forest Service has not challenged the Prosecution Team's evidence supporting the Tailings CAO, nor has the Forest Service submitted any evidence of its own, the staff reports and water quality sample analyses also demonstrate that the Tailings site is discharging copper in excess of the Receiving Water Limitation set forth in the Forest Service's Order No. R5-00-028. This meets the Water Code section 13304 and 13267 elements.

those facets of operations in the [Anaconda's] subsidiaries, including the Walker Mining Company [and Anaconda] and its subsidiary International managed the Walker Mine concurrently with the Walker Mining Company from 1918 to 1941." (Quivik Declaration, PT Exh 2, at p. 8; see also, e.g., PT Exh 1, Items 226 through 234 [correspondence between Anaconda and International managers directing and managing ongoing development activities at the Walker Mine facility].)

The Prosecution Team's evidence shows a decades-long pattern of Anaconda and International employees managing, directing and operating geological, mining and metallurgical activities at the Walker Mine facility. These activities generated the mine waste on the surface of the Mine and Tailings sites which currently discharges and threatens to discharge to Dolly Creek and Little Grizzly Creek. Anaconda and International's activities also created the underground mine workings, which are the conduits by which acid mine drainage (AMD) and other waste would reach the surface but for the mine seal. Thus, ARCO's predecessors were responsible for causing the conditions of pollution and nuisance present on the Mine and Tailings sites today.

The Prosecution Team's evidence is substantial, and has more convincing force and demonstrates a far greater probability that ARCO's predecessors operated the Walker Mine *facility* than does ARCO's evidence, which is geared more towards Anaconda's operation of the *corporate affairs* of the Walker Mining Company and thus addresses the wrong legal theory. Moreover, much of ARCO's technical evidence tends to support the Prosecution Team's proposed findings.

e. ARCO's legal arguments about how Anaconda and International did or did not manage the corporate affairs of the Walker Mining Company should be ignored as irrelevant to direct operator liability

ARCO acknowledges on page 11 of its Brief that the Prosecution Team's theory of liability is "direct operator liability" resulting from Anaconda and International's actions at the Mine *facility*.[8] But ARCO spends much of its Brief arguing that Anaconda and International did not manage the *corporate affairs* of the Walker Mining Company in such a way as to trigger derivative liability. (See, e.g., ARCO Brief, at pp. 12-13, 15-17.)

ARCO's arguments about derivative liability should be ignored because this is not a derivative liability case. ARCO is well aware that the Supreme Court in *United States v. Bestfoods* specifically held that "any person who operates a polluting facility is directly liable for the costs of cleaning up the pollution." (*United States v. Bestfoods* (1998) 524 U.S. 51, 65.) Direct operator liability occurs "regardless of whether that person is the facility's owner, the owner's parent corporation or business partner... If any such act of operating a corporate subsidiary's facility is done on behalf of a parent corporation, the

[8] For the purposes of determining direct operator liability, the Walker Mine *facility* includes both the Mine site and the Tailings site. As ARCO correctly points out, the Mine and Tailings were managed as one unit during Anaconda's operation of the site. The sites are named in separate CAOs now because of the different ownership.

existence of the parent-subsidiary relationship under state corporate law is simply irrelevant to the issue of direct liability." (*Id.* at 65-66 [internal citations omitted].)

ARCO's derivative liability arguments appear to be intentionally misleading away from the clear definition of "operator" applied in *Bestfoods*:

> [A]n operator is simply someone who directs the workings of, manages, or conducts the affairs of a facility. To sharpen the definition for purposes of CERCLA's concern with environmental contamination, an operator must manage, direct, or conduct operations specifically related to pollution, that is, operations having to do with the leakage or disposal of hazardous waste, or decisions about compliance with environmental regulations.

(*Bestfoods*, 524 U.S. at 66-67 [emphasis added].) The term "operation" "must be read ... as including the exercise of direction over the facility's activities." (*Id.* at 71.)

Under the *Bestfoods* direct operator theory, ARCO is liable for the conditions of pollution or nuisance at the Walker Mine and Tailings sites if Anaconda and/or International: 1) directed, managed or conducted activities at the Walker Mine *facility*[9]; and 2) Anaconda/International's management, direction or operation of the Walker Mine *facility* was specifically related to the conditions of pollution or nuisance at the Walker Mine and Tailings sites now.[10]

Bestfoods provides examples of what types of involvement at a facility may trigger a parent's liability: 1) where the parent operates alongside the subsidiary at the facility (e.g., in a joint venture); 2) where a dual officeholder acts on the parent's behalf at the facility; or 3) where an employee or agent of the parent directs activities at the facility. (*Bestfoods*, 524 U.S. at 71.) Such actions, the Court held, go beyond the "norms of corporate behavior" and subject the parent to direct operator liability.[11] (*Id.*) ARCO is liable here under the third *Bestfoods* example, because employees and agents of Anaconda and International directed, managed, and conducted mining operation,

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[9] Anaconda/International's oversight of the *corporate affairs* of the Walker Mining *Company* is irrelevant. *Bestfoods* clearly distinguished between inquiries into operation of the facility and derivative liability, "The question is not whether the parent operates the subsidiary, but rather whether it operates the facility, and that operation is evidenced by participation in the activities of the facility, not the subsidiary. Control of the subsidiary, if extensive enough, gives rise to indirect liability under piercing doctrine, not direct liability under the statutory language." (*Bestfoods* 524 U.S. at 67-68 [internal quotations omitted].)

[10] ARCO is wrong to argue that Anaconda/International needed to direct waste disposal activities to be liable now. "Once affirmative acts [of direction, management and activities at a facility] have been found to render someone an operator, it is no defense to liability for that operator to say it was not the actor responsible for proper management of their facilities..." (*United States v. Township of Brighton*, 153 F.3d at 315; see also *Litgo New Jersey Inc. v. Comm'r New Jersey Dep't of Envtl. Prot.* (3d Cir. 2013) 725 F.3d 369, 382 [accord].)

[11] The *Bestfoods* Court defined activities within the norms of corporate behavior as being those acts befitting the parent's status as an investor, such as monitoring performance, supervision of the subsidiary's finance and capital budget decisions, and articulation of general policies and procedures. (*Bestfoods*, 524 U.S. at 71-72.) It is beyond question that Anaconda and International did much more than that here.

development and other activities at the Walker Mine *facility* specifically related to the current conditions of pollution or nuisance at the Mine and Tailings sites.

Contrary to ARCO's assertions, the holding in *Long Beach Unified School District v. Godwin Living Trust* is in line with *Bestfoods*, "to be an operator ... a party must ... play an active role in running the facility, typically involving hands-on day-to-day participation in the facility's management." (*Long Beach Unified School District v. Godwin Living Trust* (9th Cir. 1994) 32 F.3d 1364, 1366.) *Kaiser Aluminum & Chem. Corp. v. Catellus Dev. Corp.* (9th Cir. 1992) 976 F.2d 1338, 1341-42, is also still good law to the extent that operator liability occurs where individuals working on behalf of the parent corporation actually exercised control over pollution-causing activities at the facility.

Following *Bestfoods*, courts have noted that additional indicators of operator liability include, but are not limited to, "establishment and design of the facility; participation in the opening and closing of a facility; hiring or supervision of employees involved in activities related to pollution; determination of the facility's operational plan; monitoring and control over hazardous waste disposal; and public declarations of responsibility over the facility and/or its hazardous waste disposal." (*United States v. Township of Brighton* (6th Cir. 1998) 153 F.3d 307, 327 [citing *United States v. Stringfellow*, 20 Envtl. L. Rep. 20656, 20658 (C.D.Cal. Jan 9, 1990) (citing *Rockwell Int'l Corp. v. IU Int'l Corp.* (N.D.Ill. 1988) 702 F.Supp. 1384, 1390-91)].)

In a case involving ARCO and the precise question presented here, namely whether ARCO should be liable for Anaconda's operation of a subsidiary's mine facility, the District Court for Arizona looked to historical evidence of Anaconda's involvement in geological, engineering, metallurgical, exploration, planning, purchasing and transportation activities at the subsidiary's facility. (*Pinal Creek Group v. Newmont Mining Corp.* (D.Ariz. 2005) 253 F.Supp.2d 1037, 1047.) The court specifically concluded that "[t]he operator analysis in *Best Foods* allows the considerations of Anaconda's involvement in [such] activities ... in determining operator liability." (*Id.*) The *Pinal Creek* court found Dr. Fredric Quivik's proposed testimony on these issues to be relevant to the direct operator liability question. (*Id.*) Dr. Quivik is the Prosecution Team's expert witness, and his testimony here addresses similar evidence.

ARCO's comparison of the Walker Mine to *United States v. Friedland* is misplaced. There, the court found that the evidence primarily addressed the parent corporation's involvement in managing the subsidiary *corporation*, rather than managing the pollution-causing activities at the *facility*. (*United States v. Friedland* (D.Colo. 2001) 173 F.Supp.2d 1077, 1098.) *Friedland* involved only one document where an individual on behalf of the parent purported to direct activities at the polluted facility. (*Id.*) Here, on the other hand, there are many hundreds of documents demonstrating that, for decades, individuals working only for Anaconda or International managed, operated or controlled the pollution-causing activities at the Walker Mine facility. This case is more comparable to *United States v. Meyer* (W.D.Mich. 1999) 120 F.Supp.2d 635 (shareholder liable for participation in construction of sewer lines that leaked heavy metals).

This case is even more comparable to *United States v. Newmont USA Ltd.* (E.D.Wash. 2008) CV-05-020-JLQ, 2008 WL 4621566, where the court found the parent (Newmont) liable for operating the Dawn Mine facility because, among other things, the parent always determined the onsite personnel at the facility, and:

> [A]s *Bestfoods* advises, investor status wanes when agents of the parent with no subsidiary hat to wear make decisions involving the facility which exceed the norms of general oversight.[12] As part of Newmont's management practices, Newmont developed corporate expertise in various disciplines needed for mining operations and used these expertise ... to facilitate the management of its subsidiary operations. This meant, in the case of Dawn, that at times Newmont officials with no Dawn titles performed critical functions: for example, they negotiated the first mining contract with the AEC; they designed the first Dawn mill; they negotiated sales contracts, which in turn affected the pace of mining operations required for each year; they played a significant role in rehabilitating the Dawn mill for the second operating period; and they determined transfers of Newmont personnel between other Newmont operating subsidiaries and Dawn, particularly during the periods of significant operational change.

(*United States v. Newmont USA Ltd.*, CV-05-020-JLQ, 2008 WL 4621566 (E.D. Wash. Oct. 17, 2008) [emphasis added].) Citing similar evidence, the court in *United States v. Sterling Centrecorp* (E.D.Cal. 2013) 08-CV-02556-MCE-JFM, 2013 WL 3166585, found that the parent corporation (Sterling) directly operated Lava Cap Mine, even though the Mine itself was owned by a wholly-owned Sterling subsidiary (Keystone). (*Id* at *40-48.) The courts in *Sterling Centrecorp* and *Newmont* each made these findings based on the expert testimony of Dr. Fredric Quivik.[13]

f. ARCO's evidentiary submittals regarding corporate governance issues should be ignored as not relevant to direct operator liability

ARCO attacks its corporate derivative liability theory straw man argument headlong with the Expert Report of William Haegele, a Certified Public Accountant with purported expertise in "distressed entities and creditors, corporate restructurings, mergers and acquisitions, forensic accounting, fraud investigations, and similar accounting services." (Haegele Statement, at p. 2.) Mr. Haegele's purported experience includes "evaluating and analyzing complex accounting and financial matters, including evaluating and

[12] Recall that the acceptable norms of corporate behavior for a parent include only those in line with the parent's status as an investor, such as monitoring performance, supervision of the subsidiary's finance and capital budget decisions, and articulation of general policies and procedures. (*Bestfoods*, 524 U.S. at 71-72.)

[13] The Prosecution Team submitted courtesy copies of the slip copies of the *United States v. Sterling Centrecorp* and *United States v. Newmont USA* decisions with its Case-in-Chief Submittal CD, in the electronic folder marked "Walker Electronic Records Submitted by Reference."

advising on corporate restructurings, business combinations, acquisitions, bankruptcy, creditor and shareholder rights, fraudulent transfers, and insolvency... SEC financial reporting investigations and restatement projects ... financial statement audits" and retail accounting. (*Id.*).

It is clear from Mr. Haegele's Statement, the ARCO Exhibits it references, and the associated discussion in ARCO's Brief, that the primary purpose for Mr. Haegele's involvement here is to address the *Bestfoods* "alter ego" corporate derivative liability theory. (Haegele Statement, pp. 3-11. The proposed CAOs, the Prosecution Team's Opening Brief and this Rebuttal Brief make clear that the Prosecution Team is not pursuing "alter ego" corporate derivative liability at this time. Mr. Haegele's entire testimony in this regard should be ignored.

To the limited extent that Mr. Haegele addresses anything even remotely relevant to direct operator liability, his opinions are neither substantial nor persuasive. Mr. Haegele concludes that Anaconda provided "typical investor monitoring and oversight of their investment" Walker Mining Company, and cites to evidence showing that Anaconda and International executives and directors sat on Walker Mining Company's board of directors, and that International occasionally provided financial assistance. (Haegele Statement, pp. 9-11.) The Prosecution Team does not deny that the currently available evidence tends to show that Anaconda and International may have maintained the proper corporate governance structures in managing the Walker Mining Co*mpany*. That is why the Prosecution Team is not pursuing liability under the "alter ego" derivative liability theory now.[14]

But ARCO cannot contend that Anaconda and International did not operate pollution-causing activities at the Walker Mine *facility* just because Anaconda and International acted as corporate investors over the Walker Mining Co*mpany*. The evidence here clearly shows that "employees of [Anaconda] and [International] directed, managed and conducted mining operations, development and other activities at the Walker mine facility." (PT Exh 57, Expert Rebuttal Statement of Fredric L. Quivik, PhD., at p. 1.) In this respect, Anaconda and International employees went well beyond what is expected of a typical corporate investor, thus triggering *Bestfoods* direct operator liability.

To the extent that Mr. Haegele draws conclusions about the extent to which Anaconda and International were involved in the Walker Mine facility, those conclusions are apparently based on a handful of records indicating that Walker Mining Company sometimes paid for administrative services and funded portions of the geological departments at Anaconda and International. Those records do not support any conclusion that Anaconda and International employees were not also directing, managing and conducting operations at the Walker Mine *facility*.

[14] The Prosecution Team has also submitted the Expert Rebuttal Report of Dr. Fredric Quivik (PT Exh 57) to address ARCO's misconstruction of his testimony as focusing on "alter ego" derivative corporate liability.

Mr. Haegele also offers opinion testimony regarding the significance of the "recommendation sheets" sent from Anaconda/International to Walker. (Haegele Statement, at p. 13-15.) As an initial matter, it appears that such opinion is beyond the scope of Mr. Haegele's accounting expertise. But, more importantly, Mr. Haegele minimizes the extent to which the "recommendation sheets" directly controlled the activities at the Walker Mine *facility*. Simply put, nothing happened at the Walker Mine *facility* without direction, management or control by Anaconda or International.[15]

g. ARCO's evidentiary submittals tend to support elements of the Prosecution Team's allegations

ARCO's Exhibits show that Anaconda and International took a prominent and public role in controlling, managing and directing activities at the Walker Mine facility. ARCO's Exhibit 36 is a journal article dated May 5, 1924, describing "Anaconda's Walker Mine and Mill." This article shows that those involved considered Anaconda to be in control of the Walker Mine facility:

> The control of the property as a whole is in the hands of the Anaconda Copper Mining Co., through its subsidiary, the International Smelting Co. V.A. Hart is the general manager; C.W. Page is the mill superintendent; J.S. Finlay, general superintendent and D. Mackenzie, master mechanic. H.N. Geisendorfer is mine foreman. F.C. Torkelson, of the Anaconda Copper Mining Co., superintended the construction of the milling plant, and Julius Kurtz, of the International Smelting Co., of Tooele, installed the electrical equipment. Acknowledgment is gladly made of the assistance of these men in obtaining information for the preparation of this article.

(ARCO Exhibit 36, at p. 6 [page 730 of the journal, emphasis added]; see also ARCO Exhibit 33, at p. 3 [quoting J.R. Walker in 1922: "I believe that the minority stockholders should be congratulated on having a highly efficient organization like the Anaconda Mining company in charge of development and exploitation of the property."].)

ARCO's evidence also shows that Anaconda and International played a prominent, public role in establishing the Tailings site. ARCO's Exhibit 8 contains a letter from Hart, Walker's site manager, dated February 7, 1919, to the Forest Service regarding the construction of the tailings pond. This letter was written on International's letterhead, which demonstrates that International was directly involved in managing the Tailings site, or at least put itself out in public as managing the site. In all, ARCO's Exhibits 8-27 demonstrate that International and Anaconda were deeply involved in obtaining authorization to construct the tailings impoundment.

[15] Mr. Haegele himself cites evidence showing the degree to which Anaconda/International managed and directed such activities at the Walker Mine facility, "[recommendation sheets from Anaconda/International] are forwarded to the mine-foremen for execution." (Haegele Statement, at p. 13 [quoting International's geologist Billingsly].)

ARCO's Exhibit 51 shows that, by as early as 1926, "the tailings pond [was] so full that next spring high water will carry much tailings down the creek with the possibility that they will clog irrigation ditches at Genessee and cause trouble there and also with the Debris and Fish and game Commissions." This tends to show that the Tailings site was discharging or threatening to discharge waste to cause a condition of public nuisance even as soon as a few years after it was constructed.

ARCO's Exhibit 54, page 8 indicates that, in 1927, the mine operators removed 2,719 pounds (1.36 tons) of copper from the mine discharge with the "cementation" method. Page 7 of that Exhibit indicates that the operators milled 340,156 tons of ore for the year. Page 7 also indicates that the average grade of the tails, percent copper (tailings) was 0.1154% copper. So the Mine operators discharged approximately 393 tons of copper to the tailings in 1927, while recovering about 0.344% of what they discharged. This demonstrates that the Mine facility discharged enormous quantities of copper, and related waste, to the Tailings even under the best of circumstances. (PT Exh 51, ¶ 11.)

ARCO's Exhibit 72 is the Walker Mining Company Annual Report for 1932. Mining and milling was suspended on February 28 for the remainder of that year, so copper precipitates (presumably from precipitating mine water) was a large part of the copper produced that year. 60 tons x 63% copper is 38 tons of copper recovered from the mine discharge. But the operators milled 34,741 tons and, using the 1927 average grade of the tails (percent copper (tailings) of 0.1154% copper), the operators discharged to the tailings 40 tons of copper. This demonstrates that the Mine facility discharged copper to the Tailings even in years when little mining took place. (PT Exh 51, ¶ 12.)

ARCO's Expert Report of Marc Lombardi concludes, on page 3 (#3), that "Water quality in Dolly Creek and Little Grizzly Creek near the Walker Mine is impaired by contaminants resulting from AMD, primarily elevated concentrations of copper, released from sources related to mining and processing of ore. Sources of contaminants from mining and processing ore to surface water are: mine drainage, tailings at the mill site, and tailings in the tailings impoundment area." The Lombardi Report also concludes that "the sulfide-bearing ore, mine waste, and mill tailings are the source of AMD at the Walker Mine." (Lombardi Report, at p. 5.) These conclusions are directly in line with the Prosecution Team's evidence and arguments regarding the causes and current conditions of pollution and nuisance on the Mine and Tailings sites.

The following statements in the Lombardi Report also agree with the Prosecution Team's evidence and proposed findings regarding current conditions of pollution and nuisance at the Mine and Tailings sites:

- Page 7, paragraph 3. "Recent analytical data collected by the Regional Board staff and others shows that surface water in the vicinity of the mine and tailings impoundment area is impacted by AMD from the 700 Level Adit portal, tailings in the mill site area, the settling pond in the mill site area, and the lower tailings impoundment."

- Page 7, paragraph, last paragraph. "There are three primary sources of copper in the former mill area that contribute to stream loading. These are the continued direct discharge from the portal, dissolved copper in the settling pond, and copper leaching from the mill tailings area."

- Page 8, Paragraph 3. "The tailings in the mill site area have elevated concentrations of both total and leachable copper and hence are a source of copper to surface water."

- Page 9, paragraph 1. "This drainage (the old Dolly Creek Channel) contributes an ongoing and significant copper load to Little Grizzly Creek as evident in the sampling results at monitoring location WM-6 (Figure 4.)"

- Page 9, paragraph 2. "Downstream locations along Little Grizzly Creek but upstream of the confluence of Dolly Creek (WM-7C and WM-7) have slightly higher mean dissolved concentrations relative to location WM-5. This increase is likely due to groundwater infiltration through the lower tailings impoundment and discharge to the creek along the southwestern boundary of the lower tailings impoundment."

- Page 9, paragraph 3. "Although consistently high dissolved copper concentrations in groundwater in the tailings are not indicated, some dissolved copper loading to Little Grizzly Creek due to groundwater discharge from the lower tailings impoundment cannot be ruled out."

- Pages 9-10, Little Grizzly Creek Downstream of the Tailings Impoundment. "Sample location WM-9 is the compliance point of the USFS WDRs relative to meeting the WQPS of 5 ug/L. These data show that the standard is not being met at the compliance point."

The Lombardi Report also concludes, on page 3 (#8), that the water quality issues at the Mine and Tailings are interrelated such that it will be necessary to coordinate efforts between the sites to attain water quality objectives in Dolly Creek and other surface waters. The Prosecution Team agrees with this statement, and that is why both CAOs are before the Board, and why ARCO is named to both.

h. ARCO has not demonstrated any basis for allocation of liability

ARCO argues that liability *must* be apportioned among responsible parties. (ARCO Brief, at pp. 7-8, 30-32.) ARCO makes no attempt to distinguish the legal authorities cited by the Prosecution Team in its Opening Brief (pp. 11 and 20), nor does ARCO offer any legal authority of its own. Instead, ARCO rehashes the same unsound arguments that its predecessors did not operate the Walker Mining Company's corporate affairs and that the Board and the Forest Service are responsible for the sites.

But the evidence shows that Anaconda and International were responsible for nearly all of the mining activities and tailings which cause the current conditions of pollution and nuisance at the sites. Moreover, the Board is not a responsible party, and there is no there is no legal basis to apportion ARCO anything less than joint and several liability.[16]

IV. Revisions to the proposed Mine CAO based on the briefs

The Prosecution Team now submits a revised proposed Mine CAO (R5-2014-YYYY) with the following suggested clarifying modifications to the Findings and Ordered sections in response to ARCO's Prehearing Motion Nos. 2 and 8:

Finding 28: Striking references to "hold harmless" provisions in the 1991 stipulated judgment against Calicopia Corporation and others and including a description of the effect of the stipulated judgment and citations to specific language in PT Exhibit 16.

Finding 29: Striking references to "hold harmless" provisions in the 1999 settlement agreement involving and including a description of the effect of the settlement agreement and citations to specific language in Prosecution Exhibit 54.

Ordered Paragraph No. 5: Striking references to previous expenditures with respect to cost recovery.

V. Conclusion

For the reasons stated above and in the Prosecution Team's Opening Brief, the Central Valley Water Board should adopt the Walker Mine CAO (R5-2014-YYYY) and Walker Mine Tailings CAO (R5-2014-XXXX) as proposed.

For the Prosecution Team:

ANDREW TAURIAINEN
Senior Staff Counsel
MAYUMI OKAMOTO
Staff Counsel
Office of Enforcement

[16] ARCO's Prehearing Motion No. 2 asserts that the Board is a discharger at both the Mine and Tailings, and Prehearing Motion No. 7 asserts that ARCO cannot be held jointly and severally liable. The Prosecution Team's Responses to those Motions explain why ARCO is wrong on both counts, and those Responses are incorporated by reference here.

Exhibit 38

DRAFT CLEANUP AND ABATEMENT ORDER NOS. R5-2014-XXXX AND R5-2014-YYYY
REGARDING ATLANTIC RICHFIELD COMPANY, ET AL.

Hearing Exhibit in Connection with Testimony of William Haegele March 27, 2014

Summary of Qualifications

- Forensic Partner of KPMG LLP.
- CPA, CIRA, and CFF.
- 19 years experience evaluating investor, stockholder, and parent company involvement in the oversight and operation of subsidiary investments and companies.

Information Considered and Methodology

- Considered all available historical documents including, financial statements, tax returns, and other accounting records; correspondence; corporate governance records; and Bankruptcy Court records.

- Analyzed the documents to understand the relationship between the Anaconda Companies and WMC, including the Anaconda Companies' involvement in the operations of WMC.

Summary of Opinions

- The Anaconda Companies provided typical investor monitoring and oversight of their investment, the Walker Mining Company.
- The Anaconda Companies' involvement in the Walker Mine was limited to certain administrative and procurement services and the provision of expertise, which are consistent with normal involvement on the part of a majority investor.
- The Anaconda Companies did not manage the Walker Mine.

Typical Investor Involvement

- The Anaconda Companies provided typical investor monitoring and oversight of their investment, the Walker Mining Company.

  Common investor involvement can include:

  - Overlapping officers and directors.
  - The provision of loans.

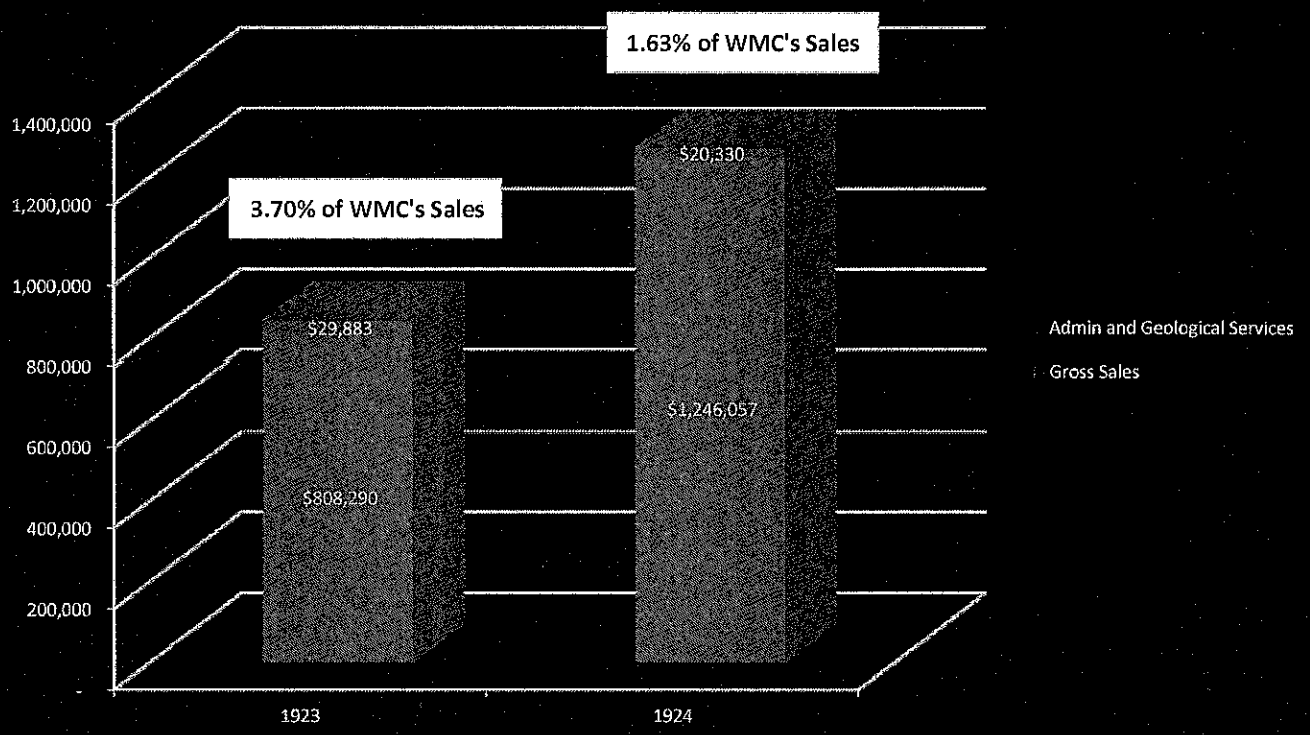
  Additionally:

  - WMC was a publicly traded company.
  - The WMC President was independent of the Anaconda Companies.
  - Minority shareholders were represented on WMC's Board of Directors.

Provision of Services was Limited

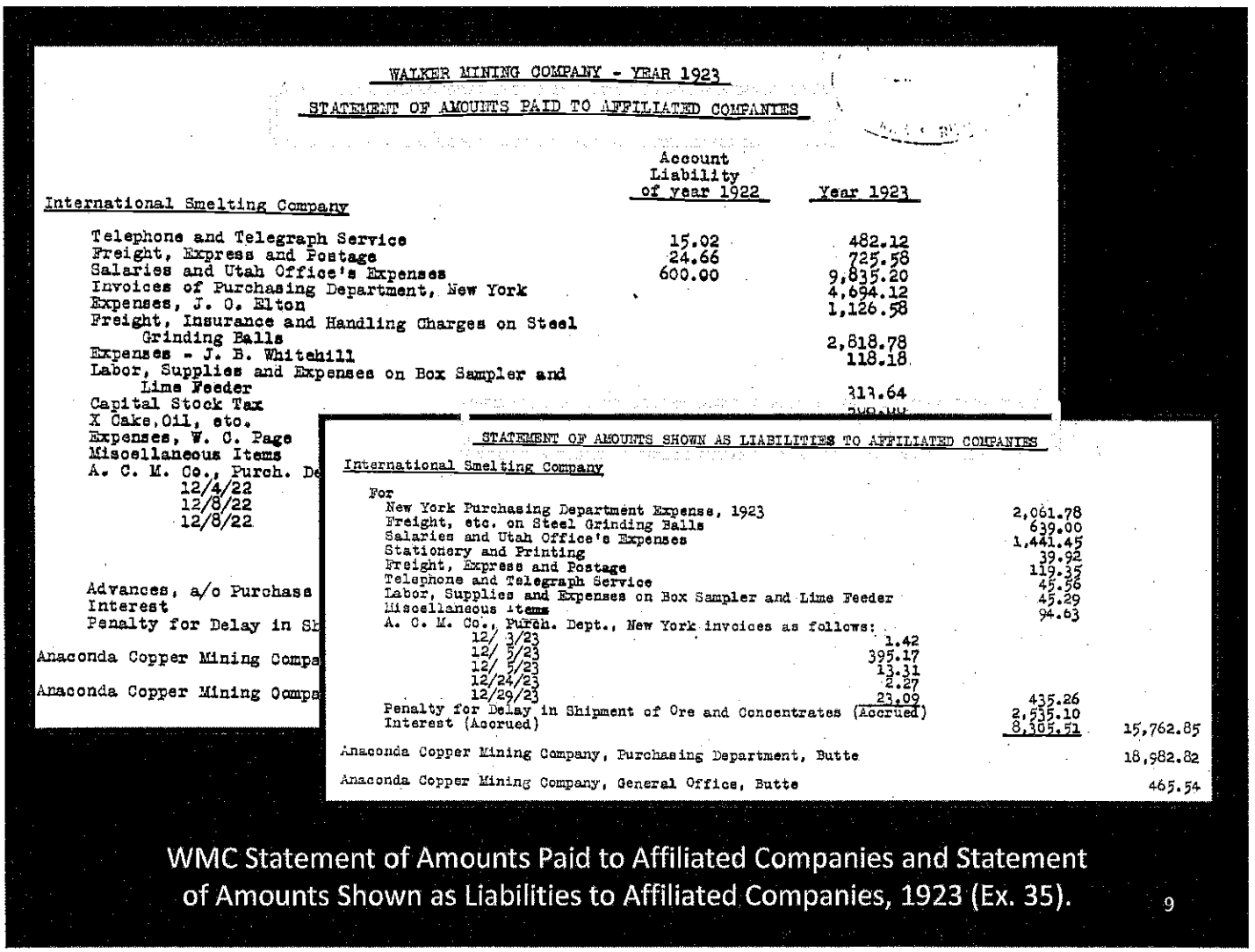
- The Anaconda Companies' involvement was limited to certain administrative services and the provision of expertise.
  - This expertise primarily related to geological and development work.
  - Involvement was limited to a modest portion of WMC's overall operations.

Involvement as a % of Sales



WMC Operated the Walker Mine

- The historical documents demonstrate the limited involvement of the Anaconda Companies in the Walker Mine.
- The Anaconda Companies did not have a contract to operate the Walker Mine.
- Figure 2 from Dr. Quivik's Rebuttal Statement further illustrates that the involvement was limited.
  - The Anaconda Companies provided geological expertise.
  - The Anaconda Companies did not manage the day-to-day operations or activities of WMC.
  - The WMC General Manager reported to the President and was responsible for day-to-day operations, such as mining, mill operations, and office management.
  - The President was independent, maintained a position on the Board of Directors, and reported to the shareholders.



WALKER MINING COMPANY - YEAR 1923

STATEMENT OF AMOUNTS PAID TO AFFILIATED COMPANIES

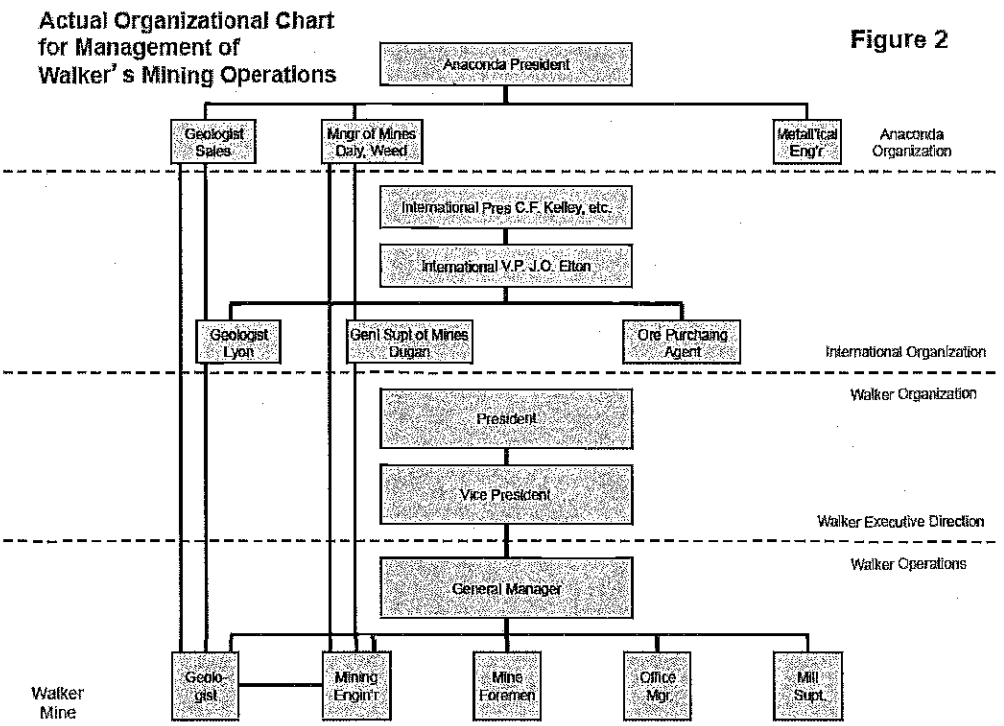
	Account Liability of year 1922	Year 1923
International Smelting Company		
Telephone and Telegraph Service	15.02	482.12
Freight, Express and Postage	24.66	725.58
Salaries and Utah Office's Expenses	600.00	9,835.20
Invoices of Purchasing Department, New York		4,694.12
Expenses, J. O. Elton		1,126.58
Freight, Insurance and Handling Charges on Steel Grinding Balls		2,818.78
Expenses - J. B. Whitehill		118.18
Labor, Supplies and Expenses on Box Sampler and Lime Feeder		313.64
Capital Stock Tax		[illegible]
X Cake, Oil, etc.		
Expenses, W. C. Page		
Miscellaneous Items		
A. C. M. Co., Purch. De		
12/4/22		
12/8/22		
12/8/22		
Advances, a/c Purchase		
Interest		
Penalty for Delay in Sh		
Anaconda Copper Mining Compa		
Anaconda Copper Mining Compa		

STATEMENT OF AMOUNTS SHOWN AS LIABILITIES TO AFFILIATED COMPANIES

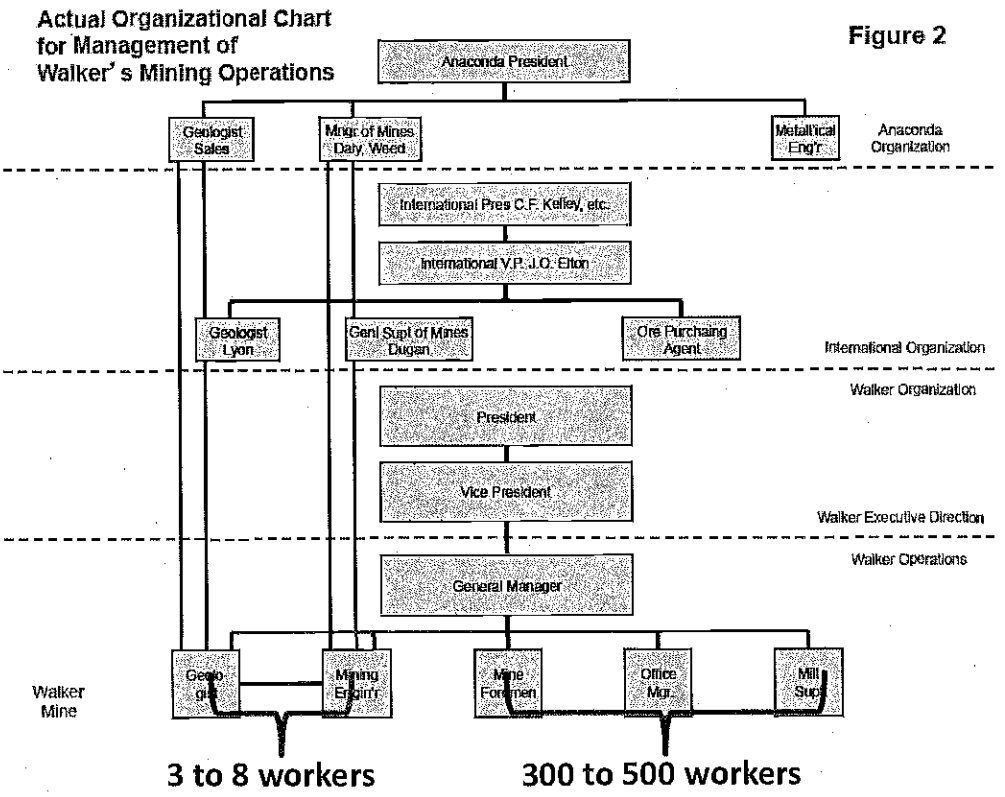
International Smelting Company			
For			
New York Purchasing Department Expense, 1923		2,061.78	
Freight, etc. on Steel Grinding Balls		639.00	
Salaries and Utah Office's Expenses		1,441.45	
Stationery and Printing		39.92	
Freight, Express and Postage		119.35	
Telephone and Telegraph Service		45.56	
Labor, Supplies and Expenses on Box Sampler and Lime Feeder		45.29	
Miscellaneous Items		94.63	
A. C. M. Co., Purch. Dept., New York invoices as follows:			
12/ 3/23	1.42		
12/ 5/23	395.17		
12/ 5/23	13.31		
12/24/23	2.27		
12/29/23	23.09	435.26	
Penalty for Delay in Shipment of Ore and Concentrates (Accrued)		2,535.10	
Interest (Accrued)		8,305.71	15,762.85
Anaconda Copper Mining Company, Purchasing Department, Butte			18,982.82
Anaconda Copper Mining Company, General Office, Butte			465.54

WMC Statement of Amounts Paid to Affiliated Companies and Statement of Amounts Shown as Liabilities to Affiliated Companies, 1923 (Ex. 35).

Dr. Quivik Organizational Chart



Dr. Quivik Organizational Chart



Mine Manager's Report

- Mine Manager's Report from H.A. Geisendorfer to WMC President J.R. Walker, Sept. 19, 1929 (Ex. 60).
  - Detailed discussion of the operations of the mine reported on a weekly basis.
  - Includes discussion of the quality of the ore; the status of the mine, mill, and tramway; the condition of the camp; the status of the tailing dam and tailing flume; and other mine operations.
- These reports show that WMC operated and managed the Walker Mine.

WORK REPORT
WALKER MINING COMPANY

Spring Garden, Calif.,
September 19th, 1929.

Mr. J. R. Walker, Pres.,
Walker Mining Company,
801 Kearns Building,
Salt Lake City, Utah.

Dear Sir:

Enclosed please find Mine Progress Report and Report on Concentration Operations for the second period of September, i. e. the seven days, September 9th to 15th inclusive:

SOUTH ORE BODY 23.6 ft. of stope drifts were driven along the footwall opening up 790 Stope, in lowgrade vein. In all 23.6 ft. of drifts were driven in this orebody, 55 tons of ore averaging 0.65% copper and 30 tons of waste were broken, and 567 tons of ore averaging 1.98% copper and 30 tons of waste were produced.

NORTH ORE BODY There was no development in this orebody.
210 Stope broke 1125 tons of ore averaging 2.19% copper.
230 Stope broke 1435 tons of ore averaging 3.70% copper.
310 Stope broke 1320 tons of ore averaging 2.18% copper.
440 Stope broke 1496 tons of ore averaging 1.00% copper.
640 A St. broke 1532 tons of ore averaging 1.41% copper.
In all 6969 tons of ore averaging 2.07% copper were broken and 4572 tons of ore averaging 1.56% copper produced.

CENTRAL ORE BODY 1017 Drift North advanced 39 ft. along the footwall of the vein, breaking 142 tons of ore averaging 1.07% copper and 57 tons of waste. The drift now is back in the vein proper, in very good ore.

1026 Raise, from 1017 DN, two compartment pilot raise to the 9th Level, advanced 20 ft. to 60 ft. breaking 98 tons of ore averaging 1.46% copper . This raise is also breaking some footwall to keep away from the fault which lies on the hanging.
680 Stope broke 237 tons of ore averaging 9.03% copper.
980 B St. broke 1348 tons of ore averaging 2.04% copper.
In all 59 ft. of drifts and raises were driven breaking 1825 tons of ore averaging 2.78% copper and 57 tons of waste, and producing 1648 tons of ore averaging 2.72% copper and 57 tons of waste.

12 ORE BODY 357 B Crosscut West, surface drift at 3rd Level elevations, driving south, advanced 15 ft. in waste.
645 C s Drift South, sublevel drift to connect with 68 B Raise, advanced 18 ft. through ore averaging 2.62% copper.
662 C s Raise, manway raise into 705 Stope, advanced ft. along the footwall averaging 1.12% copper.
769 B Raise, three compartment working raise for this orebody, advanced 41 ft. in vein averaging 0.89% copper.
605 Stope broke 415 tons of ore averaging 7.11% copper.
705 Stope broke 1253 tons of ore averaging 2.11% copper.
In all 65 ft. of drifts, crosscuts and raises were driven breaking 220 tons of ore averaging 2.79% copper and 4 tons of waste, and producing 3596 tons of ore averaging 3.37% copper and 4 tons of waste.

[illegible] ORE BODY 575 A Crosscut East, 5th Level, advanced 11.5 ft. [illegible] 88.5 ft. through mineralized quartz and schist averaging 0.88%. [illegible] last portion of this crosscut was in the hanging.

691 B s Drift South, sublevel drift in the south [illegible] of this orebody, advanced 19.5 ft. along the vein, averaging [illegible].81% copper.

790 B Raises, large size chute raise under 783 A Raise, for pocket, preparatory to sinking 783 A Raise, advanced [illegible] ft. to 27.5 ft. in waste.

715 Stope broke 1183 tons of ore averaging 1.49% copper.

72[illegible] Stope broke 276 tons of ore averaging [illegible].44% copper.

In all [illegible]8 ft. of drifts, crosscuts [illegible] driven, breaking 1751 tons of ore averaging 1.52% copper and 49 tons of waste, and producing 1356 tons of ore averaging 1.85% copper and 49 tons of waste.

G E N E R A L

THE MINE Advance in mine headings of all description amounted to 185.5 ft., including 39 ft. of large drifts, 41 ft. of three compartment working raises, 20 ft. of two compartment pilot raises, 7 ft. of large size chute raises, besides 193 tons of ore averaging 1.85% copper and 26 tons of waste sideswiped on levels. Mine breakage amounted to 12820 tons of ore averaging 2.22% copper and 140 tons of waste. Mine Production amounted to 11739 tons of ore averaging 2.33% copper and 140 tons of waste.

Mill heads for the period averaged 2.30% copper.

THE MILL operated satisfactorily for the period, crushing an average of 1682.86 tons dry per day or 11773 tons dry for the seven days, a detailed resume of which will be found on the attached metallurgical sheet. A total of 17.56 Ball Mill Hours were lost as follows: #1 Ball Mill down 0.17 hours broken rod No.1 Classifier, 0.25 hours new lip on scoop, 0.25 hours making connection on new water line, and .08 hours power off. #2 Ball Mill down 1.00 hours account low voltage, 6.33 hours for new motor bearings, 0.25 hours to make connection on new water line, and .08 hours power off. #3 Ball Mill down 2.58 hours broken oil ring, pinion bearing, reduction gear, 4.42 hours for new bearings, reduction gear, 1.00 hours for new stud bolt, reduction gear, 0.25 hours for connection on new water line, and .08 hours power off. #4 Ball Mill down 0.50 hours changing oil in reduction gear case, 0.25 hours for connection on new water line, and .08 hours power off. Other repairs were as follows: new swing jaw plate, new side liners, turned stationary jaw plate, changed grizzly bars, Primary Crusher - turned swing jaw plate, new toggle, No. 1 Secondary Crusher - New stationary jaw plate, new toggle and seat, No. 2 Secondary Crusher - new filter canvas, and worked on pipe line from storage tank to mill.

THE TRAMWAY operated satisfactorily for the period, handling 2741 buckets of concentrates outbound amounting to 1037.622 tons dry, an[illegible] 152.9470 tons of back freight. Repairs were as follows: distributed lumber and framed #36 and #37 tower, and stub tower, and put same in line, put in new foundation for 104 Tower, painted No. 3 Station and Towers 36, 93, 94, 95, 96, greased [illegible]

91601

MIN 000011838

AT THE MACHINE SHOP: Two tunnel cars were repaired, #23 with new bed plank and one new wheel and #29 with new bed plank and draw bar, and riveted door. One new car was finished, #42, and two more are on the floor in process of construction.

AT THE MILL EXTENSION, a new concrete sump for middlings has been built, 4 feet wide, 20 feet long and 10 feet deep, and two new pumps are being added. [illegible] present pump equipment is inadequate [illegible] sections operating at once. This sump is located between the flotation building and the filter building.

THE SAWMILL operated satisfactorily for the period, 226,409 board feet having been cut for the period, tot a total of 1,496,241 board feet for the season. Wood and mine poles are now coming in.

WORK OF RAISING THE TAILING DAM is progressing satisfactorily. The spillway on the north end of the dam is now being cut.

NEW HOUSES are completed and some of them occupied. Work has been started on 10 - two room cabins for baching, and on six new two room houses.

HOSPITAL Improvements are completed, and X-Ray room and sun porch, and office are now being painted.

New Lathe, Planer and Hammer have arrived and are now being set up, and double drum hoist for Flute is on the way up from Portola. The timber framer is in Portola, and car of rails also car of drill steel, have arrived at Portola.

Application has been made to the Forest Service to reserve the timber for mine use, on Sections 16, 17, 18, 19, 20 and 21, and on the north half of Sections 28, 29 and 30, all in Township 24 N., R. 12 E.

WATER continues adequate for all purposes by using considerable mine water in the mill.

WEATHER has been clear with hot days and cool to cold nights. At this writing, Sept. 19th, it is clouding for an equinoxial storm.

HEALTH of the camp is nearly back to normal, except for colds. The Typhoid case has run no temperature for the past ten days and the Doctor is only waiting the results of the second test, which, if negative, will terminate the case.

TAILING was turned through the new tailing flume on the 17th, and it is working nicely.

DAILY EMPLOYEES:

	Average number of shifts per day	382.8714
	Average [illegible] per day	5.1675
MONTHLY EMPLOYEES:	Average number [illegible]	[illegible]

91601

Yours very truly,

H. A. Geisendorfer

Manager

HAG/VA

MIN 0000 1839

WMC Operated the Walker Mine

- The Anaconda Companies could have divested some or all of their stock in WMC and WMC would have continued to operate and exist as a standalone entity.

Additional Exhibits

WMC Operated the Walker Mine

- Third parties recognized WMC as the operator and manager of the Walker Mine.
  - WMC directly interacted with third parties regarding mine operations, including government agencies.
  - Judge Johnson concluded that WMC was not controlled by the Anaconda Companies.

Government Agencies

- WMC submitted applications to government agencies for various activities, including the right-of-way for a tailings reservoir.

- Correspondence received from government agencies clearly and consistently identified WMC as the responsible party.

DEPARTMENT OF THE INTERIOR

GENERAL LAND OFFICE

WASHINGTON July , 1919.

ADDRESS ONLY THE
COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company, ; Transmitting map, etc.
; for report.

The Forester,

Department of Agriculture.

My dear Mr. Graves:

There is inclosed for your information copy of departmental decision of the 11th inst. reversing the decision of this office in the matter of the application filed by the Walker Mining Company, under the provisions of Section 4 of the Act of February 1, 1905 (33 Stat., 628) for easement for a Tailings Reservoir Site within the limits of the Plumas National Forest, Susanville, California land district.

Bankruptcy Court

- Decree in the Matter of Walker Mining Company, Debtor, by Judge Tillman D. Johnson, February 10, 1945 (Ex. 131).
  - Judge Tillman found that neither Anaconda nor IS&R dominated or controlled WMC.
  - After an eight-day hearing, the Judge concluded that,

"No act of omission of said Anaconda Copper Mining Company or of [IS&R] . . . Established by any evidence, constitutes or proves any domination or control . . . over Debtor or any of Debtor's acts, business or affairs . . ."

- Judge Tillman D. Johnson

IN THE UNITED STATES DISTRICT COURT IN AND FOR THE
DISTRICT OF UTAH, CENTRAL DIVISION

---o---o---o---o---

IN THE MATTER OF)
WALKER MINING COMPANY (No. B 16087
Debtor (D E C R E E

A full hearing before the Court of all objections to the Findings of Fact and Conclusions of Law of the Special Master herein with respect to the claim of International Smelting and Refining Company against debtor above named having been had and concluded on February 9, 1945, pursuant to stipulation of all parties concerned;

NOW, THEREFORE, the Court being fully advised in the premises, IT IS HEREBY ORDERED, ADJUDGED AND DECREED as follows:

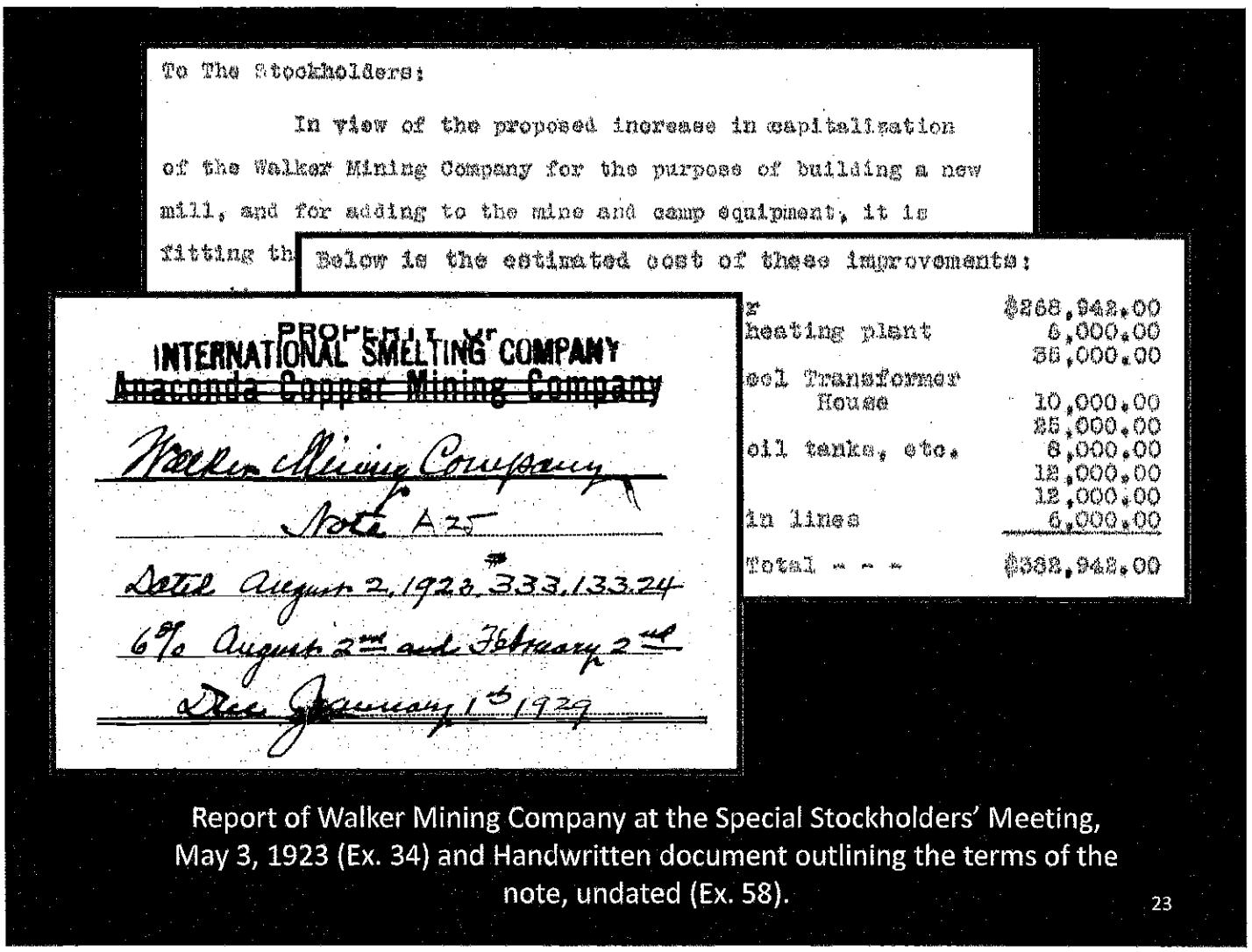
1. That said Findings of Fact and Conclusions of Law of said Special Master be and they are hereby approved and adopted as the Findings of Fact and Conclusions of Law of this Court.

2. That Debtor is not and has never at any time been an alter ego or instrument or department of Anaconda Copper Mining Company or of International Smelting and Refining Company, hereinafter called Claimant.

3. That Debtor's business and affairs have at all times been carried on and conducted in the manner and according to the methods and practice usually employed by corporations free of any domination or control by others.

4. That no act or omission of said Anaconda Copper Mining Company or of said Claimant, their officers, agents and employees, or any of them, established by any evidence, constitutes or proves any domination or control by them or any of them over Debtor or any of Debtor's acts, business or affairs, or constituted fraud, or occasioned damage or prejudice to or violated any right of Debtor or any of its stockholders.

5. That any and all advances of money made by said Claimant to Debtor were thus made as loans and not as capital investments.



To The Stockholders:

In view of the proposed increase in capitalization of the Walker Mining Company for the purpose of building a new mill, and for adding to the mine and camp equipment, it is fitting th

Below is the estimated cost of these improvements:

g	$268,942.00
heating plant	6,000.00
	35,000.00
ool Transformer House	10,000.00
	25,000.00
oil tanks, etc.	8,000.00
	12,000.00
	12,000.00
in lines	6,000.00
Total - - -	$382,942.00

PROPERTY OF
INTERNATIONAL SMELTING COMPANY
~~Anaconda Copper Mining Company~~

Walker Mining Company

Note A25

Dated August 2, 1923 #333.133.24

6% August 2nd and February 2nd

Due January 1st 1929

Report of Walker Mining Company at the Special Stockholders' Meeting, May 3, 1923 (Ex. 34) and Handwritten document outlining the terms of the note, undated (Ex. 58).

Walker Mining Company

BALANCE SHEET—AS AT SEPTEMBER 30, 1931

LIABILITIES

Capital Stock:		
1,749,308 shares @ $1.00		$1,749,308.00
Reserve for Depreciation		909,921.87
Taxes Accrued		25,620.49
Accounts Payable:		
International Smelting Company	$ 3,278.13	
Others	47,162.41	50,440.54

WMC Balance Sheet as of September 30, 1931 (Ex. 68).

Exhibit 39

ATLANTIC RICHFIELD COMPANY'S RENEWED REQUEST FOR ADDITIONAL TIME AND BIFURCATED PROCEEDINGS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2014-XXXX

ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE

WALKER MINE TAILINGS
PLUMAS COUNTY

CLEANUP AND ABATEMENT ORDER NO. R5-2014-YYYY
ATLANTIC RICHFIELD COMPANY

WALKER MINE
PLUMAS COUNTY

In its December 6, 2013 Objections to Proposed Hearing Procedures, Atlantic Richfield Company ("Atlantic Richfield") set forth, among other things, its request for (1) additional time to prepare for a hearing on these matters, (2) additional time to present its legal and factual defenses at a hearing on these matters and (3) a bifurcated hearing structure, so that apportionment and remedy could be separately prepared and considered only after a jurisdiction and liability phase, if at all.

In light of today's deadline to submit requests for additional time, Atlantic Richfield renews all requests and objections set forth in its December 6, 2013 letter. Atlantic Richfield attaches this letter hereto, and incorporates it by reference here. For avoidance of doubt, Atlantic Richfield also stands by and reasserts all factual and legal arguments made in its Prehearing Brief and Prehearing Motions in these matters and incorporates those by reference here as well.

Dated this 6th day of March, 2014.

DAVIS GRAHAM & STUBBS LLP

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December 6, 2013

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Re: Walker Mine and Walker Mine Tailings Sites, Plumas County – Atlantic Richfield Company Objections to Proposed Hearing Procedures

Dear Mr. Coupe:

This letter sets forth the Atlantic Richfield Company's ("Atlantic Richfield") comments and objections concerning the Prosecution Team's November 22, 2013 proposed hearing procedures (the "Proposed Procedures") for the two draft Cleanup and Abatement Orders (the "Draft CAOs") applicable to the Walker Mine Site (the "Mine Site") and Walker Mine Tailings Site (the "Tailings Site") (collectively, the "Sites"). Atlantic Richfield is identified as the sole "Discharger" in the current Draft Mine Site CAO, while Atlantic Richfield and the United States Forest Service ("USFS") are each identified as a "Discharger" for the Tailings Site CAO. The Proposed Procedures contemplate a two-hour hearing before the Regional Water Quality Control Board for the Central Valley Region (the "Regional Board") to consider and resolve all matters among the Regional Board, Atlantic Richfield and the USFS related to the two Draft CAOs. The Proposed Procedures are deficient for all the reasons explained below. Further, as described below and also in the enclosed alternate procedures, Atlantic Richfield believes that a bifurcated hearing structure with issues of jurisdiction and liability presented first will best serve the Regional Board's interests in efficiently and fairly adjudicating the parties' rights and obligations.

The Proposed Procedures ignore two fundamental circumstances: (1) The complexity of the legal and factual / technical issues the Regional Board must consider and resolve before deciding whether to adopt or modify the Draft CAOs; and, (2) The interrelationship of the Sites resulting from their proximity and historical development as a single integrated mine operation. The Prosecution Team's neglect of these fundamental circumstances causes several deficiencies in the Proposed Procedures and results in a truncated framework that will severely prejudice Atlantic Richfield's due process right to develop and present all the legal and factual arguments

in its defense. Specifically, Atlantic Richfield hereby objects to the following deficiencies in the Proposed Procedures:

1. The proposed hearing is not long enough to allow for presentation of all argument and evidence relevant to the numerous issues raised in the Draft CAOs. The Prosecution Team's proposed two-hour hearing would afford the Prosecution Team one hour for presenting its case, while requiring Atlantic Richfield and USFS to share one hour of presentation time. Atlantic Richfield respects the Regional Board's time and its undoubtedly crowded docket. However, the proposed two-hour hearing is wholly inadequate for an orderly presentation of the parties' arguments and evidence in a manner that efficiently discharges the Regional Board's responsibility to conduct a full and fair inquiry into the merits.

2. The proposed hearing date is too soon to allow Atlantic Richfield to develop the various factual / technical evidence and legal arguments in its defense. Further, the Prosecution Team has offered no substantial basis to support a March 2013 hearing and appears to have taken much more time to develop its own case. Electronic copies of historical documents that the Prosecution Team provided with the Draft CAOs indicate the electronic files were created in February 2013 and file names on the CD of documents more recently received in response to Atlantic Richfield's first Public Records Act request suggest the Prosecution Team was compiling records as early as December 2011. Atlantic Richfield's due process rights will not be protected if it is forced to prepare for a March 2013 hearing without any substantial basis.

3. The Proposed Procedures lack a reasonable period of pre-hearing exchange to ensure adequate disclosure of key facts. A brief summary of the procedural timeline thus far demonstrates that there is no compelling reason to limit appropriate pre-hearing procedures to meet an arbitrary schedule that the Prosecution Team has already delayed considerably. The Draft CAOs were first transmitted to Atlantic Richfield and the USFS on April 29, 2013; Atlantic Richfield responded to the Draft CAOs on June 3, 2013 (after receiving an extension of the Prosecution Team's original May 20, 2013 deadline). Four months later, on October 2, 2013, the Prosecution Team provided notice of a December hearing and issued its first set of proposed hearing procedures. When the Prosecution Team proposed separate hearings on the Draft CAOs for each Site during the U.S. government shutdown, the Regional Board appropriately rejected the Prosecution Team's proposal based on "overlapping issues" as to the Sites (by email from David Coupe to the Prosecution team, Atlantic Richfield, and USFS

on October 11, 2013).[1] The Prosecution Team then issued the Proposed Procedures along with substantive revisions of the Draft CAOs dated November 22, 2013 that will frame the issues for hearing.[2]

4. The Proposed Procedures will not efficiently resolve the preliminary question of the parties' contested liability as alleged "Dischargers" at the Sites, including the Regional Board's own liability. Many of the issues involved in the Draft CAOs raise preliminary issues regarding the Regional Board's jurisdiction and the parties' alleged liability that could bar consideration of any further issues. It will be most efficient for the Regional Board to address these fundamental questions of jurisdiction and liability first before proceeding to address the complex factual questions inherent in the Draft CAOs.

5. The Proposed Procedures do not include USFS as a party to the Mine Site CAO. The USFS is an indispensable party to the proceedings for both Sites because it unquestionably bears an interest in both Sites, is at least a former owner of the lands underlying both Sites, and possesses witnesses as well as large amounts of documentary evidence relevant to both Sites. The Prosecution Team's failure to name USFS as a party to the Mine Site CAO prejudices Atlantic Richfield by denying it access to crucial evidence. Failing to include USFS as a party also will inefficiently use the Regional Board's time and will prevent the Regional Board from properly considering USFS's potential liability for both Sites.

6. Similarly, the Proposed Procedures also fail to include the Regional Board as a party to either CAO. If given a fair opportunity, Atlantic Richfield expects to discover and present evidence that the Regional Board itself also may be responsible for work contemplated by the Draft CAOs due to its own activities at the Mine Site and its settlements with other responsible parties. A procedural framework that denies Atlantic Richfield this opportunity does not comport with the Regional Board's due process obligations.

7. The Proposed Procedures do not articulate the Prosecution Team's burden of proof. The burden of proof borne by the Prosecution Team is a fundamental legal issue that will guide the entirety of any proceedings regarding the Draft CAOs.

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[1] Despite the Regional Board's rejection of separate hearings for each Site, and despite the Prosecution Team's November 22, 2013 proposal that the hearings for each Site be unified ("Given the overlap between the parties, issues, alleged facts and evidence, the Central Valley Water Board will consider both CAOs during the same hearing," Proposed Procedures at p. 1), the Prosecution Team has persisted in suggesting separate Mine and Tailings Site hearings during subsequent communications.

[2] Important to the revised Draft CAOs, the Regional Board has abandoned its pursuit of an alter ego theory of liability against Atlantic Richfield. The Prosecution Team confirmed that intent in subsequent communications and thus comments pertinent to an alter ego theory of liability are not included here.

Ambiguity as to the Prosecution Team's burden, or an attempt to use a burden lower than that which would apply in civil court, will severely prejudice Atlantic Richfield's ability to defend against the allegations in the Draft CAOs.

8. The Proposed Procedures and the Draft CAOs appear to assume that Atlantic Richfield may be held jointly and severally liable for any and all costs or remedial activities the Regional Board determines may be necessary at the Sites. This assumption is unsupported and contrary to law.

The Regional Board must structure any hearing, and the process leading up to the hearing, to afford Atlantic Richfield and the USFS a full and fair opportunity to present evidence relevant to their alleged liability for the actions contemplated in the Draft CAOs. Because the above-described deficiencies in the Proposed Procedures would violate Atlantic Richfield's due process rights, Atlantic Richfield urges the Regional Board to reject the Proposed Procedures and adopt Atlantic Richfield's alternative procedures. The remainder of this letter elaborates on the bases for Atlantic Richfield's objections and explains why its alternative procedures would result in a more efficient and legally defensible process.

I. The Draft CAOs Raise Complex Legal and Factual Issues That Will Take Significant Time to Develop and Present to the Regional Board.

Many of the deficiencies in the Proposed Procedures result from the Prosecution Team's failure to appreciate the complexity of the numerous legal and factual / technical issues raised by the Draft CAOs. Some of the unique issues presented by these interrelated Sites are described below. As a fundamental point of departure, Atlantic Richfield (including its predecessors) never owned or operated the Sites, but instead was merely a shareholder in the publicly-traded company responsible for most of the mining known to have occurred at the Sites. The Draft CAOs thus require the Prosecution Team to present evidence and legal authority supporting an exception to the ordinary rule that it is the corporation – and not its shareholders – that bears responsibility for any liability arising from corporate operations. Further complicating the Prosecution Team's effort to impose liability for the work set forth in the Draft CAOs is the fact that the United States, through the USFS, once owned and managed all of the land area encompassed by the Sites, and continues to own and manage the land underlying the Tailings Site. In 2005, the USFS entered into a consent decree with Atlantic Richfield, and USFS is presently conducting remedial actions at the Tailings Site pursuant to its presidentially delegated authority under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"). USFS's involvement with the Sites raises several issues, most notably, the likelihood that CERCLA Section 113(h) bars any remedial actions at the Sites until USFS has completed its remedial efforts. The Regional Board itself also may be responsible for work

contemplated by the Draft CAOs due to its own activities at the Mine Site and its settlements with other responsible parties.[3]

The most important of the complex and important legal and factual / technical issues that will require the Regional Board's attention are briefly described below:

- CERCLA's Pre-Enforcement Review Bar: CERCLA Section 113(h) prevents any court or administrative agency from exercising jurisdiction over "challenges" to CERCLA cleanups. Consistent with CERCLA's goal of ensuring safe, efficient, and effective federal cleanups, case law in the U.S. Court of Appeals for the Ninth Circuit defines "challenge" broadly to include actions that "interfere with" or even those which seek to "improve upon" an ongoing CERCLA cleanup. The extent to which CERCLA 113(h) bars state-lead action at the Sites is a threshold legal issue implicating the Regional Board's jurisdiction to establish a competing cleanup plan. Resolving this legal question will also require the Regional Board to consider highly technical and scientific evidence regarding the interrelationship between the Sites.

- CERCLA's Bar on PRP Cleanups: CERCLA Section 122(e)(6) also limits interference with CERCLA cleanups by barring a "potentially responsible party" from "undertak[ing] *any* remedial action at the facility unless such remedial action has been approved by the President." The Draft CAOs thus raise multiple questions of both law and fact about the interplay between the federal CERCLA remediation program and the Prosecution Team's Draft CAOs, including whether Atlantic Richfield, USFS, and / or the Regional Board meet CERCLA's definition of "potentially responsible party," and whether the Sites constitute a single "facility."

- Shareholder Non-Liability: The general rule under state and federal law is that a corporate shareholder is not liable for the acts of the corporation, including any corporate operations that caused pollution. Atlantic Richfield's predecessors – first, International Smelting & Refining Company which was then succeeded by The Anaconda Company – were merely shareholders in the Walker Mining Company. Shares of Walker Mining Company traded publicly on the Salt Lake City and New York Curb Exchanges. The Regional Board has indicated it intends to prove an exception to the usual rule of shareholder non-liability by

[3] Atlantic Richfield has submitted two Public Records Act requests to the Board for production of such settlements and other records relevant to the allegations set forth in the Draft CAOs. The Prosecution Team has replied to the first of these requests (and a pending informal request for records) in a November 25, 2013 letter producing records and asserting claims of privilege and work product concerning correspondence "related to" its Witness List, Witness and Expert Witness Declarations, Evidence List and Legal Statement. Atlantic Richfield will seek more information as to the basis of these claims.

demonstrating that Atlantic Richfield's predecessors were so closely involved with operations at Walker Mine as to warrant a finding that the shareholder was itself an "operator" of the Mine. This inquiry will require the Regional Board to analyze decades of historical documents, including thousands of pages of business records and correspondence related to Atlantic Richfield's predecessors' relationships with the Walker Mining Company. Based on established case law, past State Water Board decisions, and the documents so far produced by the Prosecution Team, the Regional Board would go well beyond the existing precedents if it were to make a finding of liability consistent with the Prosecution Team's argument. The Regional Board cannot, therefore, hold Atlantic Richfield (including its predecessors) liable for the acts of the separate and independent Walker Mining Company.

- Regional Board Liability: The Regional Board must also consider its own liability for the Sites. The Draft CAOs indicate that the Regional Board entered settlements with multiple former owners of the Mine Site. In exchange for payments from the settling parties, the Regional Board apparently agreed to indemnify those parties. Atlantic Richfield was not a party to those agreements and has a right to challenge whether those settlements fairly allocated liabilities amongst the settling parties consistent with their degree of ownership and involvement in the activities that have given rise to liabilities at these interrelated Sites. Consideration of this issue requires discovery and analysis of the communications, negotiations, and agreements between the Regional Board and the settling parties, as well as the activities of those parties that gave rise to potential liability. Additionally, the Regional Board has undertaken remedial actions at the Mine Site and is therefore liable for (1) any actions not consistent with the standard of care applicable to its remedial activities and, (2) any discharges the Regional Board may have caused or exacerbated in the course of its remedial activities. Here, too, the Regional Board will have to consider highly technical evidence regarding the work it has performed at the Sites and what impact that work has had on environmental conditions at the Sites.

- The Consent Decree: The Regional Board must evaluate the consent decree between USFS and Atlantic Richfield, including the scope of the contribution protection provisions therein, to determine its applicability to both Sites. To simply accept USFS's argument that the consent decree does not apply to the Mine Site without naming USFS a party to the Mine Site CAO proceedings and without providing Atlantic Richfield the corresponding opportunity to present argument and evidence on that point would be a further denial of Atlantic Richfield's due process rights.

- Apportionment: If the Regional Board were to find Atlantic Richfield liable for some aspect of operation at the Mine Site or Tailings Site, the Regional Board would then have to consider the extent of that liability. Numerous entities and individuals have conducted mining and remedial operations at the Sites under various owners. Prior to the Walker Mining Company staking claims at the Sites, unknown individuals conducted mining operations there while USFS owned all of the property. Even after Walker Mining Company patented its claims, there was a period of several years, perhaps over a decade, when Walker Mining Company (including any predecessor entities or individuals) was mining but Atlantic Richfield's predecessors had not yet acquired any stock in Walker Mining Company. And even when Atlantic Richfield's predecessors did hold stock in Walker Mining Company, mining operations stopped and started. Mining operations during those times also occurred in various locations at the Mine Site. Thus, the question of what (if any) share of responsibility Atlantic Richfield could bear for current environmental conditions is exceedingly complex and will depend on detailed analysis of highly technical issues involving facts that took place 70 or more years ago. As explained above, apportionment of harm arising from the Regional Board's operations and settlements with other owners, and USFS liability for pre-Walker Mining Company mining activities must also be considered.

- State Statutory Issues: In addition to the issues identified above, the Draft CAOs raise several more issues arising from California state law, including:

  - Application of the California Water Code, section 13304(j), which bars retroactive liability for lawful activities.

  - Application of statutes of limitation and repose for the Draft CAOs which seek to impose remedial obligations on the named Dischargers to each order.

  - Application of California Water Code Section 13304(c), which bars recovery of past costs through CAOs.

  - Application of California Code of Civil Procedure Section 877, which bars imposition of liability upon Atlantic Richfield for matters covered by the release of claims from the USFS.

Presenting the foregoing issues in either state or federal court would require two or more weeks of trial. Such a trial would be preceded by multiple rounds of extensively briefed and argued motions, as well as months of discovery including depositions of fact and expert witnesses. Atlantic Richfield recognizes that the Regional Board cannot replicate court procedures in its administrative framework, but the deficiencies in the Proposed Procedures must

be cured to allow presentation of the arguments and evidence the Regional Board will need to reach a reasoned decision on the many issues raised by the Draft CAOs.

II. The Sites are Interrelated as a Result of Both Historical Operations and Geography.

Besides overlooking the number and complexity of issues, the Proposed Procedures also fail to appreciate the interrelationship of the Sites. The Walker Mining Company operated the Sites as one facility and the connection between the Sites continues to this day. The Mine Site is adjacent to the Tailings Site less than a mile upstream along Little Dolly Creek. The tailings at the Tailings Site are the byproduct of mine operations at the Mine Site; after economically valuable portions of copper had been removed from the Walker Mine ore, the mill tailings were directed downstream for collection at the Tailings Site. Little Dolly Creek still connects the Sites. Accordingly, any remedial activity the Regional Board decides to require at the upstream Mine Site – which would almost certainly alter the quantity or character of Little Dolly Creek's flow, as well as possibly altering groundwater levels and movement in the area's aquifer – could potentially impact ongoing remedial activities at the downstream Tailings Site.

Considering both Sites at the same time is thus an integral part of Atlantic Richfield's counter-proposal. The interrelationship between the Sites means that most of the legal and factual defenses described above apply as much to the Mine Site as to the Tailings Site. Most importantly, the CERCLA Section 113(h) issue must be evaluated as to both Sites given the likely impact upstream remedial actions would have on the USFS's remedial work at the Tailings Site. Of course, the possibility that the Prosecution Team can prove some exception to the usual rules of shareholder non-liability is also dependent on historical facts relating to the integrated development and operation of the two Sites.

The Prosecution Team's continued suggestion to hold separate hearings on the two Sites, and USFS's apparent acquiescence in that suggestion, would only add to the inefficiencies inherent in the Proposed Procedures. USFS suggests that it would simplify matters for the Regional Board to consider the Tailings Site separately, if at all. That is not the case. As explained above, the Sites' histories cannot be considered separately and cannot be evaluated without USFS's full participation. The only issue related exclusively to USFS – sovereign immunity – relates to both sites insofar as Atlantic Richfield asserts that USFS must be a party to both Draft CAOs. If Atlantic Richfield's alternative procedures are adopted, the sovereign immunity issue may be evaluated along with all the other threshold issues implicating the Regional Board's jurisdiction and the parties' alleged liability. Given the litany of other issues the Regional Board must confront, no efficiency will result from separating the hearings based solely on the USFS's assertion of sovereign immunity.

III. Atlantic Richfield's Alternative Procedures Provide a More Efficient Framework for Resolving all the Issues the Regional Board Must Consider.

To efficiently address the many issues raised by the Draft CAOs, Atlantic Richfield proposes a hearing structure that bifurcates the more complex legal issues into a preliminary phase and leaves the more intensively factual / technical apportionment and remediation questions for a second phase. Atlantic Richfield's proposed calendar and protocols for pre-hearing discovery and disclosures is enclosed as an Addendum to this letter. A summary description of the bifurcated hearing structure follows.

A. Jurisdiction and Liability Phase

The first phase of the bifurcated hearing would consider all matters related to the Board's jurisdiction over the two Sites and the Parties identified as a "Discharger" for each site. This first phase would also consider all matters related to the liability of any Designated Party or third party for payment of costs, performance of actions, and any other relief at either or both Sites under the Draft CAOs.

The issues raised by the Prosecution Team's assertion of jurisdiction and designation of Atlantic Richfield and USFS as liable parties in these circumstances are the more complex legal questions the Regional Board must consider. Further, depending on how the Regional Board resolves these threshold legal questions, additional development of more complicated factual and technical issues may not be necessary. Atlantic Richfield therefore proposes dedicating a first phase hearing to the following issues:

1. Does CERCLA Section 113(h)'s bar on pre-enforcement review, the federal Consent Decree for the Walker Mine Tailings Site, sovereign immunity principles, and / or bankruptcy discharge provide a defense, in whole or in part, to the Regional Board's claims and grounds for jurisdiction at each Site?

2. Is the Regional Board a liable party as an "operator" for either Site or arising from settlements with other owners / operators for either Site?

3. Does The Anaconda Company's direct involvement with Walker Mining Company and the Walker Mine merit an exception to the usual rule that a corporate shareholder will not be held liable for the corporation's acts?

4. Is USFS a liable party as an "owner" or "operator" of the Tailings Site and does USFS bear any liability for the Mine Site?

5. Are there any third parties with liability for either Site?

6. Have all necessary parties been joined in the action?

7. Are any of the other issues raised above, or any further liability or jurisdictional issues that may later emerge, an impediment to the Regional Board's assertion of its authority in these circumstances?

The timeline and calendar appended to this letter outlines discovery and other pre-hearing tasks, and supports scheduling a "first phase" hearing in May 2014. The hearing would allocate time separately for both legal argument and factual testimony over the course of two days. The first three hours of hearing time would be devoted to oral argument and questions from the Regional Board concerning legal issues. The remainder of the first day of hearing and at least six hours on a second day of hearing would be used for presenting factual and expert testimony.

B. Apportionment and Remedy Phase

The second phase of the bifurcated hearing would consider the complex issues of apportionment and remedy. Phase 2 would proceed only in the event the Regional Board made liability determinations in the Phase 1 hearing that require further proceedings to resolve issues related to implementation of the Draft CAOs. In particular, if the Regional Board determined that Atlantic Richfield's predecessors had operated either of the Sites to some extent, further proceedings would be needed to determine what portion of the Walker Mine's operations Atlantic Richfield's predecessor had conducted, what (if any) ongoing environmental impacts those operations by Atlantic Richfield's predecessors caused, and what several (allocated) share of remedial costs or remedial actions Atlantic Richfield should bear as a result. Consistent with whatever findings the Regional Board made in Phase 1, the Regional Board would also need to consider allocation of costs and / or remedial action to USFS and the Regional Board itself.

As outlined in the appended timeline, deadlines for Phase 2 would begin to run only after the Regional Board issued a written decision addressing all of the issues raised in Phase 1. The Phase 2 determination would include such issues as:

1. Causation issues for each Site (i.e., specifically what operations each Designated Party conducted and what ongoing environmental conditions those operations caused).

2. Apportionment of costs and / or remedial responsibilities among liable Designated Parties for each Site.

3. The nature and relationship of the remedy for each Site.

4. Regional Board authority to bind a Designated Party to perform any future response action the Regional Board may identify after the Phase 1

and Phase 2 proceedings have been concluded and while any remedial activities are being carried out.

Assuming a written decision is available soon after the Phase 1 hearing, Phase 2 discovery could be completed in advance of a September or October hearing date. We refer to the appended timeline for a description of Phase 2 pre-hearing procedures and disclosures.

C. Applicable Rules.

The Proposed Procedures do not identify the Prosecution Team's burden of proof for the hearing. The Proposed Procedures also do not identify any basis on which the Prosecution Team may hold Atlantic Richfield jointly and severally liable under the Draft CAOs, though the Draft CAOs themselves suggest that is the Prosecution Team's intent. Accordingly, Atlantic Richfield urges the Regional Board to adopt the following procedural rules to govern any hearing it sets on the Draft CAOs:

- At any hearing on the Walker Mine Site and / or the Walker Tailings Site, the Prosecution Team will have the burden of production, together with the burden of persuasion by a preponderance of the evidence, as to any finding of fact and as to any finding that one or more parties is responsible for cleaning up and abating the site in question, including the proportionate share of liability which should be allocated to each such party. Each respondent will have the burden of production, together with the burden of persuasion by a preponderance of the evidence, as to any affirmative defense offered at the hearing.

- In any portion of a hearing assigning responsibility to Atlantic Richfield for either remedial activities or the costs of remedial activities, the Prosecution Team shall have the burden to prove that any remedial activities or costs for which it seeks to hold Atlantic Richfield responsible are necessary because Anaconda or International Smelting & Refining Company has caused the specific condition requiring remediation by a discharge of wastes into the waters of the state.

- In any portion of a hearing assigning responsibility to Atlantic Richfield for either remedial activities or the costs of remedial activities, the Prosecution Team shall be precluded from presenting any evidence of remedial activities or costs attributable to a discharge of wastes into the waters of the state by any individual or entity other than Anaconda or International Smelting & Refining Company.

Proceeding to a hearing without additional clarification of the rules proposed above would be a further violation of Atlantic Richfield's due process rights.

On behalf of Atlantic Richfield, we look forward to the Regional Board's decision as to the appropriate procedures for resolving the claims made in the Draft CAOs.

Sincerely,

William J. Duffy
for
DAVIS GRAHAM & STUBBS LLP

Enclosures
cc: Andrew Tauriainen, Esq.
Michael Hope, Esq.

IMPORTANT DEADLINES
Phase 1 Hearing

December 6, 2013	▪ Atlantic Richfield (AR) / USDA will transmit any requests under CPRA to the Regional Board by this date. ▪ The Board will respond to each request within 10 days of receipt and produce documents and other responsive information within 30 days of receipt.
January 17, 2013	▪ Each Designated Party may propound up to 20 interrogatoriees by this date. Responses to interrogatories are due within 20 days of receipt.
January 31, 2013	▪ Each Designated Party may propound up to 20 requests for admission by this date. ▪ Responses to requests for admission are due within 20 days of receipt.
February 7, 2014	▪ Designated Parties must ask the Board to add additional parties by this date.
February 24, 2014	▪ Each Designated Party shall disclose a list of witnesses that may be called to testify at the hearing, including a brief description of the topics each witness will cover. This disclosure shall include a general description of the type of experts, if any, the party intends to use. The identity of any expert need not be disclosed until the expert disclosure.
March 7, 2014	▪ The Designated Parties will exchange expert disclosures that shall contain the qualifications of the expert, a summary of all opinions the expert may offer at the hearing, and a description of the basis for those opinions.
March 19, 2014	▪ A Designated Party may make supplemental expert disclosures with opinions or comments in rebuttal to another party's expert, provided that supplementation is completed this day.
March 21, 2014	▪ Each Designated Party may take up to four depositions of percipient witnesses, and depose all expert witnesses designated by the opposing side. ▪ Each deposition shall be no longer than six hours. All non-expert depositions shall be completed by this date.
April 14, 2014	▪ All expert depositions shall be completed by this date.
20 days prior to the date of the hearing	▪ The Designated Parties may submit pre-hearing briefs, with a copy provided contemporaneously to each remaining Designated Party, that outline the legal and factual matters for determination by the Board at the Hearing. Any Designated Party may request oral argument on a legal matter raised for determination by the Board. ▪ Each Designated Party may append to its pre-hearing brief proposed findings of fact and law for the Board's consideration.

10 days prior to the hearing	▪ Each Designated Party shall disclose a list of exhibits it expects to use at the hearing, and disclose any and all demonstrative exhibits including all PowerPoint presentations that may be used at the hearing.
May 2014	▪ The hearing shall take place on a mutually agreeable date in May 2014 and shall be no more than two days in length, depending upon the number of Designated Parties and Interested Persons involved and issues presented for determination by the Board. ▪ The first three hours of hearing time will be dedicated to oral argument and questions from the Regional Board regarding legal issues identified in the parties' pre-hearing briefs. ▪ The remainder of the first day's hearing time, and at least six hours during a second day of hearing, will be used for presentation of testimony and other evidence on factual issues.

IMPORTANT DEADLINES
Phase 2 Hearing

	▪ Each Designated Party and/or its experts shall be permitted access to the Walker Mine Site and the Walker Mine Tailings Site, provided at least 4 days advanced notice is provided
15 days following receipt of Board's written decision in the liability hearing	▪ AR/USDA will transmit any additional CPRA records requests by this date. The Board will respond to each such request within 10 days of receipt, and produce documents and other responsive information within 30 days of receipt.
30 days following the Board's written decision	▪ Designated Parties must ask the Board to add additional parties by this date.
30 days following receipt of the Board's written decision	▪ Each Designated Party shall disclose a list of witnesses that may be called to testify at the hearing, including a brief description of the topics each witness will cover. This disclosure shall include a general description of the expert testimony, if any, the party intends to offer at the hearing. The identity of any expert need not be disclosed until the expert disclosure, as described below.
45 days following receipt of the Board's written decision	▪ Each Designated Party may propound up to 20 requests for admission by this date. Responses to requests for admission are due within 20 days of receipt.
45 days following receipt of the Board's written decision	▪ Each Designated Party may propound up to 20 interrogatories by this date. Responses to interrogatories are due within 20 days of receipt.
60 days following receipt of the Board's written decision	▪ The Designated Parties will exchange expert disclosures that shall contain the qualifications of the expert, a summary of all opinions the expert may offer at the hearing, and a description of the basis for those opinions.
14 days following receipt of expert disclosures	▪ A Designated Party may make supplemental expert disclosures with opinions or comments in rebuttal to another party's expert, provided that supplementation is completed by this date.
60 days following receipt of the Board's written decision	▪ Each Designated Party may take up to four depositions of percipient witnesses and depose all expert witnesses designated by the opposing side. Each deposition shall be no longer than six hours. All non-expert depositions shall be completed by this date.
90 days following receipt of the Board's written decision	▪ All expert depositions shall be completed by this date.
20 days prior to the date of the hearing	▪ Each Designated Party may submit pre-hearing briefs, with a copy provided contemporaneously to each party, that outline the legal and factual matters for determination by the Board at the Hearing. Any Designated Party may request oral argument on a legal matter raised for determination by the Board.

	▪ Each Designated Party may append to its pre-hearing brief proposed findings of fact and law for the Board's consideration.
10 days prior to the hearing	▪ Each Designated Party shall disclose a list of exhibits it expects to use at the hearing, and disclose any and all demonstrative exhibits including all PowerPoint presentations that may be used at the hearing.
No sooner than one hundred twenty (120) days following publication of the Board's written decision	▪ The hearing shall take place on a mutually agreeable date no sooner than one hundred twenty (120) days following publication of the Board's written decision on the matters addressed in the Phase 1 hearing. ▪ The hearing shall be no more than two days in length, depending upon the number of Designated Parties and Interested Persons involved and issues presented for consideration by the Board.

Exhibit 40

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

CLEANUP AND ABATEMENT ORDER NO. R5-2014-XXXX

ATLANTIC RICHFIELD COMPANY
UNITED STATES DEPARTMENT OF AGRICULTURE,
UNITED STATES FOREST SERVICE

WALKER MINE TAILINGS
PLUMAS COUNTY

CLEANUP AND ABATEMENT ORDER NO. R5-2014-YYYY
ATLANTIC RICHFIELD COMPANY

WALKER MINE
PLUMAS COUNTY

ATLANTIC RICHFIELD COMPANY'S PREHEARING MOTION NO. 4 REQUESTING A REGIONAL BOARD RULING THAT DUE PROCESS REQUIRES THE BOARD TO RECUSE ITSELF

INTRODUCTION

The Hearing Procedures the Regional Board (the "Board") adopted are constitutionally inadequate for considering the contemplated Cleanup and Abatement Orders ("CAOs") against Atlantic Richfield Company ("Atlantic Richfield"). The result the Prosecution Team seeks to achieve – wholly shifting the Board's liability for the Sites by ordering Atlantic Richfield, a former shareholder of Walker Mining Company, which itself owned and operated the mine, to remediate environmental conditions on hundreds of acres of forest – would be the subject of a years-long proceeding and days or weeks of trial if pursued in a court. Yet the Board has given Atlantic Richfield only 45 minutes of hearing time and a few months to prepare and present its defenses to the Prosecution Team's claims. These procedures do not afford Atlantic Richfield a meaningful opportunity to investigate all relevant facts related to the Sites and to present that information to the Board. The Hearing Procedures thus do not satisfy the federal or state constitutions' guarantees of due process. Nor could the Board ever satisfy due process in a prosecution involving these Sites given the Prosecution Team's failure to acknowledge in its case-in-chief the Board's own liability for the conditions at the Sites.

Atlantic Richfield therefore moves the Board for a ruling that the Board must recuse itself from ruling on the Draft CAOs.

BACKGROUND

The facts at issue in this case date from 1906 to 1941. That is the period of time when Walker Mining Company operated the Mine and Tailings Sites and the period of time during which the Prosecution Team claims that International Smelting & Refining Company ("IS&R") and Anaconda Copper Mining Company ("Anaconda") incurred the liability supposedly supporting the Draft CAOs. Under *United States v. Bestfoods*, which the Prosecution Team agrees supplies the governing standard, the Board must look at these hundred-year-old facts and evaluate whether IS&R or Anaconda directed pollution-causing activities at the Mine or Tailings Site. (Prosecution Team Opening Brief at p. 12 ("Under *Bestfoods*, operator liability occurs where the parent corporation operated the subsidiary's facility and directed the activities that caused the pollution.").) The *Bestfoods* standard thus incorporates a requirement that the Board determine in the first instance what pollution is occurring at the Sites and what activities caused that pollution, issues that require experts' scientific and technical examination. In sum, the alleged Dischargers, the Prosecution Team, and the Board not only must uncover and understand a one hundred-year-old historical record, but must also develop and distill a body of scientific facts related to the current environmental conditions at the Sites and the historical mining practices that could have caused those conditions.

Unsurprisingly, given the complicated nature of the facts and law at issue, Board staff has taken multiple years just to conduct the investigation on which the Prosecution Team now relies in attempting to justify the CAOs against Atlantic Richfield. In 1999,

the Board threatened enforcement against Atlantic Richfield upon these same facts, but elected not to proceed. (Exhibits 149-152.) The Board staff's more "recent" investigation of the Sites appears to have begun in at least 2010. (*See* Draft CAO R5-2014-YYYY at ¶ 35 ("[Board] staff recently obtained and reviewed relevant documents from the database and other sources."); Exhibit No. 157, Board email to Anaconda Collection dated Sept. 2010.) By contrast, Atlantic Richfield was able to begin preparing for the upcoming hearing only in October 2013 when (after a four month period of silence following Atlantic Richfield's June 3, 2013 comments on the original Draft CAOs), the Prosecution Team confirmed that it would go forward with the prosecution of this matter.

A final schedule for the hearing was not announced until January 27, 2014 when the Advisory Team rejected Atlantic Richfield's challenges to the Prosecution Team's proposed hearing procedures[1] and, instead, adopted the Prosecution Team's proposed deadlines: February 20, 2014 for presentation of Atlantic Richfield's evidence and legal arguments in written form, and March 27 or 28, 2014 for the hearing. The Hearing Procedures give Atlantic Richfield only 45 minutes to present evidence and argument to the Board. Despite Atlantic Richfield's requests, the Hearing Procedures lack any provision for formal discovery and deposition procedures, for expert disclosure procedures, or for separate argument of legal issues. Finally, Atlantic Richfield's request for bifurcation of the hearing on the CAOs was rejected. Bifurcation would have allowed the parties to develop and present evidence to the Board first as to liability and, only if necessary, as to the divisibility and proper apportionment of responsibilities for carrying out the CAOs. The Advisory Team did not articulate any reasons for rejecting Atlantic Richfield's requests.

ARGUMENT

I. The Hearing Procedures Violate Due Process By Denying Atlantic Richfield An Adequate Hearing.

The U.S. Supreme Court's decision in *Mathews v. Eldridge* determines the constitutional adequacy of proceedings that deprive a person of property. Under *Mathews*, courts analyze three factors to determine what process is due: "First, the private interest that will be affected by the official action; second, the risk of an erroneous deprivation of such interest through the procedures used, and the probable value, if any, of additional or substitute procedural safeguards; and finally, the Government's interest, including the function involved and the fiscal and administrative burdens that the additional or substitute procedural requirement would entail." 424 U.S. 319, 335 (1976); *see also Ching v. Mayorkas*, 725 F.3d 1149, 1157-59 (9th Cir. 2013) (applying *Mathews* to overturn a U.S. Citizenship & Immigration Services decision). The Board's procedures in this case fail under the *Mathews* test and therefore violate due process.

[1] Atlantic Richfield's objections to hearing procedures are attached hereto as Exhibit 4023.

A. The Private Interest at Stake is Substantial.

If entered, the Draft CAOs would impose a substantial burden on Atlantic Richfield. The Draft CAOs contemplate a remediation project of unknown magnitude and cost occurring over multiple years on Sites covering more than 900 acres. The Board claims to have already spent $2.6 million at the Mine Site. Atlantic Richfield provided $2.5 million to the United States Forest Service (the "USFS") pursuant to the terms of the 2004 Consent Decree. What additional work Board staff contemplates for the Sites and the costs associated with that work are entirely unknown (the Board has provided Atlantic Richfield no opportunity to investigate the Sites beyond a single site visit).[2]

B. The Board's Procedures Pose a Great Risk for Error.

In *Mathews*, the Supreme Court recognized that the risk of error is greater in cases involving more complicated legal and factual questions. *See Mathews* (contrasting cases with "sharply focused and easily documented" facts to those where "a wide variety of information may be deemed relevant").[3] 424 U.S. at 343. Few substantive areas are more factually and legally complex than those in the environmental arena and, in particular, those where issues under *Bestfoods* arise. As detailed above, the Board's decision applying *Bestfoods* in this case will require it to consider facts that are more than a hundred years old, that involve historical mining practices, and that call upon the Board to understand multiple aspects of geology and modern environmental sciences. With only a few months for Atlantic Richfield to develop evidence in its defense and only 45 minutes for Atlantic Richfield to present that evidence to the Board, the risk of the Board erring is high.

The risk of error here is especially great because the Board denied Atlantic Richfield's request to bifurcate the hearing on the Draft CAOs to allow separate testimony and argument as to what, if any, apportioned share of liability Atlantic Richfield should bear. Under applicable law, Atlantic Richfield has a right to prove that any liability it has for the Sites is divisible from the shares of liability borne by other parties, including the Board itself and also USFS. (See Prehearing Motion No. 7.)

C. The Board has No Legitimate Interest in Such Minimal Procedures.

Having allowed the alleged pollution at the Sites to continue since at least 1958, having decided once already not to take enforcement action against Atlantic Richfield and, more recently, having spent more than three years investigating Atlantic Richfield, the Board has no legitimate argument for not allowing Atlantic Richfield additional time

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[2] Upon receiving notice that prosecution of the Draft CAOs would go forward in December 2013, Atlantic Richfield was able to visit the sites only one time. The Sites are located in a remote mountainous area that cannot be accessed during the winter, which can last as long as six months.

[3] In simple cases, less robust procedures may satisfy due process. *See, e.g., Machado v. State Water Resources Control Board*, 90 Cal. App. 4th 720 (Cal. App. 2001) (when there was only one potentially liable party, the ownership of that party was not in dispute, and there was an eye witness to the pollution at issue, a full hearing was unnecessary).

to prepare. Likewise, the Board has offered no explanation for giving Atlantic Richfield only 45 minutes to present its evidence and legal arguments at the hearing.

II. The Board Is Biased And May Not Constitutionally Adjudicate Any Claim Related To These Sites.

"[A] fair trial in a fair tribunal is a basic requirement of due process." *Withrow v. Larkin*, 421 U.S. 35, 46 (1975). This case requires the Board to determine whether to shift all or a portion of its own liability onto the Dischargers named in the Draft CAOs. While the Board will not likely consciously act on its bias, the chance of its bias unconsciously impacting its decision remains too great. When a tribunal's members have a financial interest in the outcome of a case, "experience teaches that the probability of actual bias on the part of the [tribunal] is too high to be constitutionally tolerable." *Id.* The financial interest need not be personal to the tribunal members; instead, a decision-maker's interest in maintaining the funds in a public account is sufficient to disqualify that person from serving as an adjudicator. *See Ward v. Village of Monroeville*, 409 U.S. 57, 59 (1972) (holding that a mayor could not be an impartial adjudicator where the revenue produced by fines in his court provided a "substantial portion of [the] municipality's funds"); *Esso v. Lopez*, 522 F.3d 136, 147 (1st Cir. 2008) (holding that the Puerto Rican Environmental Quality Board was not impartial where it sought to impose a fine that would be paid into an account it administered).

The risk of Board bias in considering the Draft CAOs is unconstitutionally high. The Prosecution Team has failed to acknowledge and fairly represent in its case-in-chief that the Board bears a substantial share of the liability for the Sites. The Board's liability arises not only from taking on the remediation of the Mine Site, but also from stepping into the shoes of former Mine Site owners by settling with, releasing, and holding harmless those parties. Indeed, according to its own documents, the Board staff has prepared the Draft CAOs with findings against Atlantic Richfield in the hopes of offloading its liability. The Board's own liability is too great for the Board to provide the constitutionally required fair tribunal.

CONCLUSION

Given the constitutional inadequacies of the Board's procedures in this case and the risk of Board bias in ruling on the Draft CAOs, Atlantic Richfield respectfully requests that the Board rule, as a matter of law, that the Board must recuse itself from ruling on the Draft CAOs.

Dated this 20th day of February, 2014.

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Exhibit 41

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER NO. _____
ATLANTIC RICHFIELD COMPANY AND
U. S. DEPARTMENT OF AGRICULTURE,
FOREST SERVICE, PLUMAS NATIONAL
FOREST, WALKER MINE TAILINGS,
PLUMAS COUNTY

The Walker Mine Tailings (tailings) are an existing copper mine tailings dump. Tailings from the Walker Mine mill were deposited in a natural basin at the confluence of Dolly and Little Grizzly Creeks on public land administered by the U. S. Department of Agriculture, Plumas National Forest (USFS). Historical records show that Atlantic Richfield Company (ARCO), as the successor of several companies that owned and operated the mine, is a responsible party of the Walker Mine. The WDRs jointly name the USFS and ARCO as Discharger.

During the time the Walker Mine was operating, from 1916 to 1941, Dolly Creek was diverted around the tailings area. The diversion is almost completely filled in or in disrepair. After the mine ceased operations, the tailings area also fell into disrepair. Portions of a containment levee eroded and timbers of a flashboard dam disintegrated, which resulted in a discharge of tailings and turbid water to Little Grizzly Creek. To contain the tailings, the USFS reconstructed the levee along the west bank of Little Grizzly Creek and the flashboard dam across the mouth of Dolly Creek. However the tailings continue to erode and flow into surface waters during rainfall events and snow melt periods.

Acid mine drainage from the upstream Walker Mine property flows into Dolly Creek prior to Dolly Creek entering the tailings site. While effluent from the Walker Mine causes upstream receiving water limits for copper to be exceeded, the tailings continue to contribute significant concentrations of copper to Dolly Creek. Data collected by Board staff indicates that the dissolved copper concentration upstream of the tailings averages 22 μg/l while copper concentrations at the USFS dam averages 119 μg/l (data from 1996 through 1998).

The USFS has prepared a Record of Decision (ROD) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act. The objectives of the ROD were to reduce sediment loading from the tailings into Dolly Creek, to reduce the export of copper from the tailings and Dolly Creek and Little Grizzly Creek, and to stabilize the tailings from water and wind erosion. The ROD proposed reconstructing Dolly Creek, constructing a 15-acre wetland to treat metal discharges, and raising the flashboard dam. The Rod also recommended constructing wind barriers on the tailings and revegetating 60 acres with grasses, shrubs, and trees. The USFS has initiated stabilization of the tailings by planting trees and grasses. However, the revegetation efforts were marginally successful primarily because there is not enough nutrient material in the tailings to sustain growth.

These WDRs incorporate receiving water limitations at the Point of Compliance (R-5). These limitations are based on USEPA National Recommended Water Quality Criteria (April 1999) for copper, iron, and zinc. Receiving water limitations for copper and zinc vary with hardness of the receiving waters. The hardness is based on Little Grizzly Creek at R-5. The copper and zinc limitations are calculated using a hardness of 50 mg/l as CaCO3 (based on historic data). Due to infrequent sampling, the limitations conservatively apply the 4-day average equation as an instantaneous maximum concentration:

$$\text{Copper} = e^{0.9422(\ln(\text{hardness}))-1.7} \times 0.96$$
$$\text{Zinc} = e^{0.8473(\ln(\text{hardness}))+0.884} \times 0.978$$

The current discharge from the Walker Mine tailings does not meet the receiving water limitations. Therefore, these WDRs provide a time schedule for compliance with receiving water limitations. The schedule requires additional improvements in Dolly Creek and a continuation of the tailings rehabilitation.

These WDRs remove the numerical standard for settleable solids discharges and the requirement to monitor total suspended solids and total settleable solids. The Basin Plan provides narrative standards for suspended and settable solids. The WDRs require the Discharger to follow the applicable water quality standards contained in the Basin Plan.

Exhibit 42

United States
Department of
Agriculture

Office of
the General
Counsel

Pacific Region
San Francisco Office
33 New Montgomery, 17th Floor
San Francisco, CA 94105-4511
415-744-3011; FAX 415-744-3170

August 19, 1997

Neal Brody
Senior Attorney
Atlantic Richfield Corp.
444 S. Flower St.
Los Angeles, CA 90071

Dear Mr. Brody:

Per our discussion, I've spoken with Terry Benoit, and I'd like to confirm our meeting for the afternoon of September 29, 1997 at the Plumas National Forest Supervisor's Office in Quincy, California. We can do a site visit that afternoon, and meet Tuesday morning, Sept. 30, to continue our discussions.

Enclosed is a copy of the ROD for the Walker Mine Tailings.

If you have any questions, please let me know.

Very truly yours,

Rose Miksovsky

Rose Miksovsky

cc: Terry Benoit, PNF (w/o encl.)
Cecilia Horner (w/o encl.)
Lloyd Rowsey (w/o encl.)

RECORD OF DECISION

FOR REMEDIATION OF THE WALKER MINE TAILINGS

BECKWOURTH RANGER DISTRICT, PLUMAS NATIONAL FOREST

April, 1994

RECORD OF DECISION

FOR REMEDIATION OF THE WALKER MINE TAILINGS

PLUMAS NATIONAL FOREST

PLUMAS COUNTY, CALIFORNIA

PREPARED BY: Terry A. Benoit

TERRY A. BENOIT
Forest Hydrologist

4/26/94
Date

RECOMMENDED BY: Jeff Withroe

JEFF WITHROE
Acting District Ranger
Beckwourth Ranger District

May 20, 1994
Date

RECOMMENDED BY: H. Wayne Thornton

H. WAYNE THORNTON
Forest Supervisor

May 25, 1994
Date

APPROVED BY: Melroy H. Teigen

MELROY H. TEIGEN
Acting Director, Engineering
Pacific Southwest Region

June 10, 1994
Date

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WALKER MINE TAILINGS RECORD OF DECISION

- Close the site to public access where needed to protect treatment features.

- Monitor for success and compliance with Applicable, Relevant and Appropriate Requirements (ARARs).

Declaration

The selected remedy is protective of human health and the environment, meets Federal and State requirements that are applicable, relevant and appropriate to this remedial action and is cost-effective. The remedy satisfies the statutory preferences for remedies that employ treatment that reduces toxicity, mobility or volume as a principal element and utilizes permanent solutions to the maximum extent practicable. The remedy meets requirements provided by the State of California.

MELROY H. TEIGEN
Acting Director, Engineering
Pacific Southwest Region

6/10/94
Date

DECISION SUMMARY

I. Site Name and Location

The Walker Mine Tailings are located on National Forest land approximately 15 miles east of the Plumas County community of Quincy in Section 12, T24N, R11E; and Sections 7 and 18, T24N, R12E; Mt. Diablo Baseline and Meridian (Figure 1).

At an elevation of 5750 feet mean sea level, the tailings area is at the confluence of Dolly Creek and Little Grizzly Creek, tributary to Indian Creek, then the East Branch North Fork Feather River. Dolly Creek flows from northeast to southwest from near the Walker Mine and across the tailings area. Little Grizzly Creek flows along the southern edge of the tailings area from southeast to northwest (Figures 2 and 3).

II. Site Description, History and CERCLA Response Actions

The Walker Mine, located on patented lands, produced copper and minor quantities of gold and silver from 1915 through 1941. The 1941 operation was shut down and has since remained idle except for occasional exploration activities.

The tailings area is located in a natural basin three-quarters of a mile southwest and downstream of the Walker Mine on Dolly Creek at its confluence with Little Grizzly Creek. The tailings were produced as a slurry at the mill located at the mine site. This slurry flowed by gravity to the tailings site where it was impounded by a small dam on Dolly Creek. Much of the free water from the milling process evaporated, leaving behind a well distributed pile of fine-grained, sandy, silty, and clay-like tailings material covering an area of approximately 100 acres to an average depth of 28 feet (based on borings made in 1992).

The Walker Mine has a long history of pollution, acid mine drainage, heavy metals contamination, and noncompliance with Waste Discharge Requirements (WDRs) established by the California Regional Water Quality Control Board, Central Valley Region (CVRWQCB). In 1987, the CVRWQCB retained an engineering contractor to design and install a concrete seal in the mine tunnel to minimize acid mine drainage and discharge of heavy metals into waters from the mine. The seal appears to be effective in reducing mine discharge into the nearest receiving water, Dolly Creek, then Little Grizzly Creek. See Figure 2 for a summary of the current affectiveness of the mine seal.

The Walker Mine Tailings also adversely affect the water quality of Dolly Creek and Little Grizzly Creek. Dolly Creek, and any remaining drainage from the Walker Mine, flow from northwest to southwest along the northern portion of the tailings, picking up leachate water and resulting in release of tailings, heavy metals (copper, iron, and zinc), and turbid water to the receiving waters. In 1958 the CVRWQCB adopted Resolution No. 58-181 prescribing discharge requirements for the tailings, and named the USFS and the owners of the Walker Mine as the dischargers. In 1986 the CVRWQCB rescinded Resolution No. 58-181 and issued WDRs Order No. 86-073, naming the USFS as the sole discharger. New WDRs were issued in 1991 and Resolution No. 91-017 was adopted. Maximum receiving water quality criteria for the compliance station on Little Grizzly Creek, downstream of the Walker Mine Tailings were established.

The Walker Mine tailings site was placed on the Federal Agency Hazardous Waste Compliance Docket ("the docket"), pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 42 USC 9620 (c)) by the U.S. Environmental Protection Agency (EPA) in 1991.

A site investigation was started in 1990 and completed in 1992 with the installation of monitoring wells and a waste characterization program. the 1990-1991 investigation focused on the release and transport of copper and sediment from the tailings and the development of alternatives for stabilizing and reclaiming the tailings area. Included in the study was an investigation and preliminary assessment of health risks to forest users and workers at the site.

Other contamination pathways, such as groundwater, were studied and determined to be insignificant or non-existent, although questions still remain because of increased concentrations of copper detected in Little Grizzly Creek between the confluence with Dolly Creek and the Brown's Cabin monitoring site.

III. Community Relations

Community relations were initiated in 1989 when the East Branch North Fork Feather River Coordinated Resource Management group (EBNFFR CRM) added the treatment of the Walker Mine Tailings into their water quality improvement program. The EBNFFR CRM is a formal partnership that includes 19 local, state and federal agencies plus private land owners and the Pacific Gas and Electric Company. The primary goal of the EBNFFR CRM is water quality improvement in the East Branch North Fork Feather River.

A formal public involvement plan was initiated in September 1991, to facilitate public involvement with the proposed project. The public includes the EBNFFR CRM, local, State and Federal agencies, interested and affected individuals and groups, and Potential Responsible Parties (PRPs). Communications included direct mailings, newspaper notices, news releases, and public meetings. Interested parties also became informed and involved through personal communications.

Public support for the project has been positive, except for a few people who use the site as a "playground" with their off-highway vehicles (OHV). Support from the various government agencies has also been positive.

The primary support agency has been the CVRWQCB. United States Forest Service (USFS) personnel and water quality engineers for the State agency have worked closely to analyze the site and develop treatment alternatives.

The PRPs have been identified and requested to participate in the planning process. Little response has been received until lately, when the Atlantic Richfield Company (ARCO) was identified in 1993. ARCO responded immediately and positively (See Appendix).

Copies of all relevant documents have been sent to interested parties, the CVRWQCB, and PRPs. Comments on the draft documents were solicited. The Proposed Plan for remediation of the site was also handled in this way.

Very little public interest has been demonstrated. Homeowners in Genessee Valley, downstream from the tailings area have informally expressed their support of the proposed treatments, as have other interested parties.

Recreation users of the site, as mentioned above, have informally expressed their desire to leave the site as it is and allow them to continue to use the area for off-highway vehicle use.

Mr. Leroy Pedersen of Four Hills Mining Company has made numerous contacts with the USFS regarding the treatment of the tailings material. He is working with a patented process to treat tailings material containing high amounts of silica, removing the metals and the silica. Further testing of the process is required before it can be evaluated and approved for use. If this or any process is found to be a desirable remedy for the site in the future, there is nothing in the proposed treatment that will preclude their use and effectiveness.

No response has been received from Mr. Henry R. Barry, CEO, Calicopia Corporation, owners of the Walker Mine and a Potential Responsible Party (PRP) for remediation of the tailings area. The latest mailing to Mr. Barry resulted in a return mailing and no forwarding address. Efforts to locate him suggest that he is no longer in the country and that Calicopia Corporation no longer exists.

Three PRPs hold mining claims on the tailings area. No work has been performed by them, except for a minimal amount of exploratory work. Contact was made with one of the claimants, Mr. Archie Sparkman, who spoke for all of the claimants. They would like to dissolve all interest in the site. They have not paid taxes on the claim for the past three years. Mr. Sparkman said they fully support the treatments that are proposed for the site.

Recently, another PRP has surfaced as a result of research conducted for the USFS by TechLaw Inc. TechLaw has established a fairly solid link between the Walker Mining Company and Anaconda Company. Additionally, TechLaw has substantiated Anaconda Company's relationship to Atlantic Richfield Company (ARCO). The USFS notified ARCO of their potential responsibility and received a positive response with a willingness to participate in remediation efforts to the limit of their liabilities, which still needs to be determined. They have also responded in support of the proposed treatments for the site, stating that they believe them to be very practical and reasonable.

AR
AS
PRP

IV. Site Characteristics

Where Dolly Creek flows across the tailings area, the upper channel section has incised 20 feet through the tailings material to native soil. It is here where most of the sediment enters Dolly Creek for transport downstream. Water is the primary agent eroding the tailings material to the streams, although wind drives a significant amount of tailings material from the surface of the tailings to the gully banks, where it is then picked up by flowing water. Below this incised section, Dolly Creek becomes braided and is dominated by alluviation and continuous bed movement. Some natural wetland development is occurring in this area. The base level is controlled by a sediment retention dam constructed originally by the operators of the Walker Mine and then reconstructed in 1979 by the USFS.

The beneficial uses of the water from Dolly Creek and Little Grizzly Creek are:

1. Agricultural water supply.

2. Recreation.

3. Aesthetic enjoyment.

4. Preservation and enhancement of fish, wildlife, and other aquatic resources.

Downstream beneficial uses of the Feather River include:

1. Municipal water supply.

2. Industrial water supply.

3. Ground water recharge.

4. Hydroelectric power generation.

The mean annual precipitation for the area is about 40 inches, with a significant portion in the form of snow. The mean minimum temperatures at the site for the months of January and July are 16 degrees Fahrenheit and 42 degrees Fahrenheit, respectively. Surface runoff usually results from snowmelt, but fall and spring rains and summer thundershowers are also common.

Vegetation in the vicinity of the mine and tailings area consists largely of mixed conifer forest. The tailings area is mostly nonvegetated but does support locally vegetated areas containing rushes in low-lying areas, islands of pines and shrubs, and islands of sedges along Dolly Creek. Because of this general lack of vegetation, moisture levels in the tailings material rarely drops below field capacity even during the summer months. Only the top three to six inches completely dries out.

TAILINGS SATURATED MOSTLY

Groundwater in the surrounding area is found in seasonal shallow or perched aquifers (decomposed granite) mantling bedrock surfaces or fractured-rock aquifers formed by the interconnected joints and fractures in the bedrock. Ground water in the tailings area is controlled primarily by the elevation of the sediment dam, but does reflect moisture conditions during winter and summer months. During the monitoring well installation in October, 1992, water elevations averaged 5.73 feet below the surface of the tailings material, ranging from 0.40 feet to 17.23 feet below the tailings surface.

The tailings aquifer is recharged by snow and rain falling onto the tailings area, by several springs surrounding the site and possibly buried by the tailings material, by conveyance along the original Little Grizzly Creek channel (now buried by tailings material), and directly by Dolly Creek as it flows across the tailings area. Discharge occurs by evaporation from the surface, by seepage along the base of the levee separating Little Grizzly Creek from the tailings material, by surface and seepage flow over and through the sediment retention dam, and, possibly, by seepage through rock fractures and the original Little Grizzly Creek channel.

V. Risk Assessment Summary

Copper, iron and zinc are continually released into Dolly Creek and Little Grizzly Creek through a variety of pathways, exposing aquatic organisms to lethal or otherwise stressful concentrations of these metals. These organisms have been shown to be either killed outright or their life cycles affected to such a degree that they cannot maintain viable and productive populations. Approximately 3800 feet of Dolly Creek and about one mile of Little Grizzly Creek are affected by the contaminants released from the tailings. Within that one-mile section of Little Grizzly Creek, dilution and biological uptake reduce contaminant concentrations to near background levels.

Human health is potentially affected when dust emanating from the tailings area is inhaled. The respirable free silica is crystalline in form and can cause silicosis and lung cancer, especially under occupational exposure for several years. Concentrations of metals in the tailings material known to cause human health problems have been identified, but are at levels in the surface material that is indistinguishable from soils at background sites. Table 1 displays metals found in the tailings material at well sites and bore holes. Table 2 displays metals released into the waters of Dolly Creek (Station R1, above the tails; and Station R2, below the tails) and Little Grizzly Creek (Station R3, above the tails; Station R4 below the tails; and Station R5, the compliance station located below the confluence with Dolly Creek). Station R6 is an overflow pipe located near the middle of the tailings area and next to Little Grizzly Creek. Refer to Figure 4.

Metals found in the tailings material, but not released into the environment in amounts detrimental to human health or the environment include:

Arsenic	Barium	Cobalt	
Iron	Lead	Mercury	Chromium
Silver	Thorium	Vanadium	Nickel

The primary land and resource uses in the area include timber harvesting, mining and recreation. Downstream uses include recreation, fishing, and irrigation of pasture land at the mouth of Little Grizzly Creek. There are no known diversions of water for domestic purposes.

Human exposure to dust is limited to recreational use of the site and to workers in and around the site. Recreation on the site is primarily OHV use. This activity causes large amounts of the tailings material to become airborne, especially where these vehicles are concentrated. Wind also causes large amounts of the tailings material to become airborne, often making it difficult to see and breath.

In addition, wind erosion affects the surface of the tailings area on a daily basis during the growing season. Plants emerging on the site are sheared, buried, or eroded away. The lack of nutrients for plant growth makes it difficult for all but the hardiest plants, usually pioneering varieties, to emerge in the first place.

Towards the end of the mining and milling operations at Walker Mine, ore was completely processed then discharged into Dolly Creek to flow freely downstream to the tailings dump. The areas of the tailings covered by this

ORE NOT PROCESSED COMPLETELY ?

material are distinctly different from the rest of the tailings area. These areas are limiting plant growth due to acidic conditions, increased solubility of metal ions, elevated levels of iron, and deficiency of sulphur, calcium, and molybdenum. Molybdenum is required by many pioneer species, especially legumes which typically will not grow without sufficient molybdenum for nitrogen fixation.

Most of the tailings material is affected by a lack of similar nutrient chemistry. This includes both macronutrients (nitrogen, phosphorous, potassium, sulfur, calcium, and magnesium) and micronutrients (manganese, boron, and molybdenum). There is a general low level of nitrogen, phosphorous, iron, and molybdenum. The obvious lack of organic matter, necessary for cation exchange, limits the uptake of nutrients. For the purposes of plant growth, all of the tailings are deficient in all of the major plant nutrient cations (potassium, calcium, and magnesium).

Since treatment of the tailings is proposed on-site and none of it removed, there is a risk that treatments may not be fully successful and release of contaminants could continue above levels described in section VII, Remedial Action Goals and Objectives.

VI. Applicable or Relevant and Appropriate Requirements (ARARs) Analysis

Any alternative should comply with applicable or relevant and appropriate requirements (ARARs). The Environmental Protection Agency (EPA) determined that this site does not warrant placement on the National Priorities List (NPL) by evaluating its hazards and vicinity to human habitations. As a consequence, the site falls under the jurisdiction of California's Environmental Protection Agency and their mandated clean-up standards.

Requirements applicable or relevant and appropriate to the site have been identified through formal communication and consultation with the California State Attorney General, and the CVRWQCB, plus other relevant State and local agencies. None of the ARARs listed have been waived.

Identified ARARs are as follows:

1. State Water Board Resolution 68-16 (anti-degradation policy):

This resolution satisfies the Federal Clean Water Act anti-degradation policy requirement.

It requires the continued maintenance of high quality waters of the State even where that quality is better than needed to protect beneficial uses, unless specific findings are made.

Water quality may not be allowed to be degraded below what is necessary to protect beneficial uses in any case.

2. Order No. 91-017. Waste Discharge Requirements (WDR) for the U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County:

A. Discharge specifications (water over the dam and from the culvert):

1. Neither the treatment nor the discharge shall cause a pollution or nuisance as defined in Section 13050 of the California Water Code.

2. The discharge shall not cause degradation of any water supply.

3. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

4. The discharge shall not contain more than 0.2 ml/l settleable solids.

B. Sludge and Solid Waste Disposal:

1. Sludge and/or solid wastes generated by remediation activities shall only be discharged to a waste management unit which is in compliance with the requirements of Title 23, Division 3, Chapter 15, California Code of Regulations (CCR), or to a site(s) which has been approved by the Executive Officer.

2. The Discharger may propose alternative sludge or solid waste disposal alternatives if the waste is to be treated. Disposal of treated waste must comply with Chapter 15 requirements and be approved by the Executive Officer.

C. Receiving Water Limitations:

1. The discharge(s) shall not cause concentrations in Little Grizzly Creek, at a point immediately above Road 25N42 and above the west side spring discharge (R-5) to exceed the following limits:

Constituents	Units	Limitation*
Aluminum	ug/l	750.00
Cadmium	ug/l	1.80
Copper	ug/l	9.22
Iron	ug/l	1000.00
Lead	ug/l	33.80
Mercury	ug/l	2.40
Zinc	ug/l	65.00

* [Copper and zinc are the only constituents presently detected at the water monitoring stations. Copper and zinc are synergetic in their effects to aquatic organisms. The current goal of remedial actions at the site is to reduce the release of copper and zinc (Cu + Zn) to 10 mg/l, or less, at hardness of 50 mg/L $CaCO_3$. See Figure 2, Browns Cabin Station.]

Receiving water limitations for cadmium, copper, lead, and zinc are adjusted for hardness at the Little Grizzly Creek upstream station (R-3), according to equations established in the Waste Discharge Requirements Order.

The discharge shall not cause visible oil, grease, scum, foam, floating suspended material in the receiving waters or watercourses.

3. The discharge shall not cause concentrations of any materials in the receiving waters which are deleterious to human, animal, aquatic, or plant life.

4. The discharge shall not cause aesthetically undesirable discoloration of the receiving waters.

5. The discharge shall not cause bottom deposits in the receiving waters.

6. The discharge shall not cause fungus, slimes, or other objectionable growths in the receiving waters.

7. The discharge shall not increase the turbidity of the receiving waters by more than 20% over background levels.

8. The discharge shall not alter the normal ambient pH of the receiving water more than 0.5 units.

3. Crystalline silica dust presents the highest public health concern at the tailings. The Safe Drinking Water and Toxic Enforcement Act of 1986 identifies airborne particles of respirable size, crystalline silica (Chemical Abstracts Services Registry date: October 1, 1988) as known to the State to cause cancer. Although listed, the State of California, Environmental Protection Agency, Department of Toxic Substances Control did not identify any specific air quality ARARs for the site. The Plumas County Department of Environmental Health has provided general comments that it will enforce exposure restrictions upon frequent users and workers at the site by requiring restricted access and/or use of proper respiratory equipment.

VII. Remedial Action Goals and Objectives

GOALS. Protection of the beneficial uses of Little Grizzly Creek from the release of contaminants to the environment (receiving waters) from the tailings area.

Protection of the health of users and workers at the site from the exposure to tailings dust.

OBJECTIVES. To reduce the release of contaminants from the tailings area to Dolly Creek and Little Grizzly Creek by meeting the requirements for receiving water as stated in State Water Board Resolution No. 68-16 (the antidegradation policy requirement), or, if not feasible, the requirements in Waste Discharge Requirements Order No. 91-017 within five (5) years of completion of remediation work.

To eliminate the inhalation of fugitive dust by humans using and working at the site within five (5) years of completion of remediation work.

VIII. Description of Remedial Alternatives

The no action alternative serves as a baseline for comparison of the other alternatives. No action means that no remedial activities will be conducted to reduce or cleanup the hazards associated with the generation and release of

contaminants from the tailings material. Surface and perched groundwater monitoring would be conducted as part of this alternative; however, to quantify the impact associated with a no remedial response action. The site conditions would be re-evaluated periodically to determine whether there have been any changes regarding risk to human health and the environment.

The following is a brief summary of the alternatives considered:

The tailings have been divided into two areas for treatment; (1) Dolly Creek and (2) the remainder of the tailings. The Dolly Creek area includes the active stream channel and the area extending out to, and including, the gully banks.

Treatment alternatives considered, but dropped from the analysis include:

Alternative 6: Covering the tailings area with impermeable material to reduce the amount of oxygen and water that contact sulfide materials. This would be very costly and impractical for this site.

Alternative 7: Actively treating water leaving the site to remove contaminants. This also would be very costly and impractical for this site.

Alternative 8: Use of bactericides to stop the ferric to ferrous transfer. The bacteria to be treated would be found in the upper layers of the tailings material. These bacteria have been found to be, for all practical purposes, non-existent in this area.

Any of these treatments could be revisited if the proposed treatments are found to be ineffective on the site or if new information about the site or these treatments arises.

There are two proposed alternatives, plus the no action alternative, for each of the two areas. The four alternatives considered in detail are summarized below.

[illegible] the Dolly Creek area, would be treated by either Alternative 2 or 3.

[illegible]ternative 2: Channel Erosion Control and Development of a Wetland for [illegible]ssive Water Treatment.

[illegible]der this alternative, Dolly Creek would be stabilized by reconstructing the [illegible]tural geometry of the channel and revegetating all banks in the upstream [illegible]rtion of the channel and by constructing a wetland in the lower portion. The [illegible]land would not only stabilize the lower portion of Dolly Creek, but it would [illegible]ve to passively treat contaminated water leaching through the tailings [illegible]rfall to Dolly Creek before it flows to Little Grizzly Creek.

[illegible]rnative 3: Diversion of Dolly Creek Around the Tailings Area, [illegible]llization of Dolly Creek Below the Diversion and Passive Water Treatment.

[illegible]ve 3 would include the treatments described above in Alternative 2 [illegible] diversion of Dolly Creek around the tailings area to Little Grizzly [illegible]a would separate the "good" water from the "bad" water. Water from

rain and snow melt plus spring and other groundwater flows would still leach metals from the tailings material to Dolly Creek. Flood flows from the upper watershed area would still pass through the existing Dolly Creek channel on the tailings.

Area 2, the remainder of the tailings area, would be treated by either Alternative 4 or 5.

ALTOGETHER FLOW OF WATER FROM UPSTREAM WOULD IMPACT PASSIVE TREATMENT

Alternative 4: Revegetation and Wind Erosion Control.

Alternative 4 would involve modest, low-cost efforts to revegetate the area plus provide wind erosion control measures. The surface of the tailings area is constantly blowing around, inhibiting natural revegetation from occurring. Wind on the area also causes large dust clouds to form, creating a health hazard because it contains large amounts of very fine grained, crystalline silica.

Revegetating the surface of the tailings area is expected to not only eliminate the wind problems over the long-term, but to eventually reduce oxygen in the acid producing, aerated upper layer of the tailings material (the vadose zone), thus reducing the release of contaminating metals to Dolly Creek, and the wetland.

This alternative would use plants that are known to survive conditions existing at the site. Fertilizers would also be used where needed. Mixing plant species such as lodgepole pine and legumes is expected to enhance plant survival. lodgepole pine would provide one of the major tree components and legumes would provide a long-term nitrogen supply to the trees. The underlying principle for successful revegetation of the site is the maximization of plant diversity utilizing plants of known tolerance to the site. This should provide a stable plant community that would require little to no long-term maintenance.

Alternative 5: Vegetated Soil Islands and Wind Erosion Control.

Alternative 5 would employ the same wind erosion control measures as in Alternative 4, but instead of immediately revegetating the entire area, islands of imported soil would be constructed and vegetated. Because covering the entire tailings area with soil was determined to be impractical and too costly, this alternative was developed. The vegetation on these islands would be expected to migrate into unvegetated areas; areas containing no imported soils.

None of the above described treatment alternatives would preclude future treatments that employ improved technologies, providing that they meet treatment objectives and site requirements. Potentially, technologies that would result in total removal and treatment of the tailings material would provide a more permanent solution than the alternatives considered, if cost effective and environmentally acceptable.

IX. Comparative Analysis of Alternatives

Discussion. Each alternative was evaluated using the nine criteria outlined in 40 CFR 300.430, paragraph (e) (9) (iii). These evaluation criteria are as follows: overall protection of human health and the environment; compliance with ARAR's; long-term effectiveness and permanence; reduction of toxicity,

mobility, or volume through treatment; short-term effectiveness; implementability; cost; State acceptance; and community acceptance.

Upon completion of the the detailed analysis of each alternative against each of the nine evaluation criteria, a comparative analysis was conducted that focused on the relative performance of each alternative against those criteria. A preferred treatment was selected and a proposed plan developed and presented for review and comment to the public, State agencies involved with the project, and identified Potential Responsible Parties (PRPs). Two public meetings were held to discuss the proposed plan, one in Portola and one in Taylorsville. Comments were reviewed in consultation with the State in order to determine if the proposed plan is the most appropriate treatment for the site. Changes to the proposed plan are discussed in the following section.

Analysis. There are two areas to be treated, Dolly Creek and the remainder of the tailings area. Alternatives should be combined to provide total site remediation. Alternatives 2 and 3 treat Dolly Creek and its riparian areas and banks. Alternatives 4 and 5 treat the remainder of the tailings area. For this reason, only Alternative 2 and 3 can be compared together and Alternative 4 and 5 compared together. Each alternative and its treatment area are as follows:

Alternative		Treatment Area
1	No Action	
2	Channel Erosion Control and Developed Wetland	N/A
3	Alternative 2 plus Diversion of Dolly Creek	Dolly Creek
4	Revegetation and Wind Erosion Control	Dolly Creek
5	Vegetated Soil Islands and Wind Erosion Control	Remainder of Tails
		Remainder of Tails

he following summarizes the comparative analysis using the nine evaluation riteria listed above.

verall Protection of Human Health and the Environment

ie implementation of either Alternative 2 or 3 alone would not provide rotection of the health of humans using or working at the site because they e strictly designed to treat the problems associated with the flow of Dolly eek on the tailings area and contaminants that have leached into Dolly Creek.

e control of wind and water erosion and dust containing respirable ystalline silica would require the implementation of either Alternative 4 or Long-term institutional controls, similar in all alternatives, would ovide immediate protection of human health.

alternatives, except the No Action alternative, reduce contaminant release some level. Alternatives 2 and 3 would passively treat the waters of Dolly ek in a wetland environment before it enters Little Grizzly Creek. ernatives 4 and 5 would reduce oxygen in the vadose zone of the tailings a, thereby reducing contaminant concentrations in the leachate water flowing Dolly Creek.

implementation of Alternative 2 or 3 would also stabilize the Dolly Creek mel and gully walls, reducing erosion and sedimentation. Alternative 3

provides exactly the same treatment as Alternative 2 with the addition of a diversion on Dolly Creek upstream of the tailings area and routed around the site to Little Grizzly Creek. This would reduce the amount of water flowing in the Dolly Creek channel located on the tailings area. Water would still flow in the abandoned channel, but at a much reduced rate, along with the leachate water from the tailings material. Passive water treatment would still be relied upon.

An unknown problem would be the reduction of the water table in the tailings material if Dolly Creek is diverted around the tailings area. It is unknown whether or not springs and seeps in the area would maintain the existing water level alone. It is important that the tailings water table be kept as high as possible to limit the amount of tailings material that is exposed to water and oxygen.

Alternatives 4 and 5 would stabilize the remainder of the tailings area. Alternative 4 would result in the immediate revegetation of the site through use of special plant material adapted to the site, fertilizers, some organic material, and wind erosion control. Total vegetation coverage of the site from the implementation of Alternative 4 is expected to occur in approximately 10 years.

Alternative 5 would import soil to form islands to be revegetated. Importing soil to the site would increase costs considerably. It is expected that over time (30 years) this vegetation would spread into the inter-island areas, where wind erosion control measures would be used. Wind erosion control measures would utilize logs, straw, forest debris and "brush trench packs," vegetation, and wind fences. Water erosion would also be minimized by these measures.

Compliance with ARARs

Since Waste Discharge Requirements are not currently being met, the no action alternative cannot meet ARARs. All other alternatives would be expected to meet the specific ARARs they are designed to address.

The implementation of Alternative 2 alone (no upstream diversion) is expected to meet water quality ARARs. The success of the treatments would be evaluated at five year intervals. If water quality improvements are occurring, no further actions would be taken except monitoring. If water quality is not improving, or doesn't appear to be able to meet ARARs, further remedial actions would be considered, including the diversion of Dolly Creek around the tailings area (Alternative 3). Alternative 3 would be expected to reduce the amount of contaminants entering Little Grizzly Creek from Dolly Creek, but water treatment would still be required to reduce metal concentrations in the leachate water from the tailings material. Alternative 3 would reduce the amount of contaminated water flowing to Little Grizzly Creek, but may not reduce the amount of contaminants released from the site to Little Grizzly Creek without the wetland water treatment system.

Alternatives 4 and 5 are expected to help reduce acid generation and the release of contaminants to leachate water. By themselves they would not meet ARARs, but do address the human health hazards caused by inhalation of dust from the site. It is expected that Alternative 4 or 5 would begin reducing acid generation in less than ten years.

The evaluation of the ability of the alternatives to comply with ARARs includes a review of chemical and physical specific ARARs plus action items to prevent human exposures. These were presented earlier in this report. There are no known location-specific ARARs for this site.

Long-term Effectiveness and Permanence

The treatment of Dolly Creek with either Alternative 2 or 3, PLUS the treatment of the remainder of tailings area with either Alternative 4 or 5 provides the highest degree of long-term effectiveness and permanence, treating all known contaminant pathways plus the generation of contamination over the entire site. If either Alternative 2 or 3 is implemented alone, only partial treatment would be provided, leaving natural mechanisms to treat the remainder of the site. The implementation of either Alternative 4 or 5 alone would not meet water quality goals, no matter how long they are in place.

Long-term protection of human health would best be achieved by institutional controls if either Alternative 2 or 3 is implemented alone. Institutional controls could be terminated after site stabilization if either Alternative 4 or 5 is implemented along with Alternative 2 or 3.

DO ICs NEED TO BE TIED TO BOM SITES TOGETHER?

There is no evidence that there is any long-term advantages between Alternatives 2 and 3 at this time. Monitoring water quality is expected to give the evidence needed to consider the installation of the diversion structures in Alternative 3.

It is expected that both Alternative 4 and 5 would meet project goals, although it is estimated that Alternative 5 would require at least 30 years to become fully effective. Acid generation and mobility of contaminants would be reduced after site stabilization and reduced oxygen in the vadose zone. Passive treatment of water leaving the site would eliminate release of contaminants leaching to Dolly Creek, or, at least, reduce them to acceptable levels.

The difference between Alternatives 4 and 5 is the time of effectiveness and probability of success. Alternative 4 would address the entire treatment area but would not use any soil amendments. It would rely solely on the proper vegetation and planting techniques. Alternative 5 creates topsoil where revegetation is expected to flourish, then it relies on spread of that vegetation between the islands, finally covering the entire site. Wind erosion would be controlled, vegetation spread is expected to occur slowly. Revegetation of the entire site would probably not be as successful in Alternative 4 and, therefore, less effective in the long-term. Alternatives are expected to be permanent, requiring little maintenance after vegetation establishment. Institutional control of public access would be required to protect rehabilitation features and plants until it has become fully rehabilitated.

Protection of Dolly Creek would be permanent, but would require 5-10 maintenance. The wetland would require long-term (greater than 30 years) to facilitate its effectiveness. Monitoring water quality is a long-term element to ensure that all treatments are properly and ARARs continue to be met.

Reduction of Toxicity, Mobility, or Volume Through Treatment

TOXICITY: Copper and zinc toxicity in Dolly Creek and Little Grizzly Creek is expected to be reduced to levels required by the Central Valley Regional Water Quality Control Board by reducing the amount of copper and zinc released into these streams. All alternatives, except Alternative 1 (No Action), would reduce the release of copper, but in different ways.

Alternatives 2 and 3 would reduce the transport of copper that is attached to sediment particles by stabilizing the Dolly Creek channel and its gully. Both alternatives would then treat Dolly Creek water and the tailings leachate by passing the water through a constructed wetland. In addition, Alternative 3 would divert the lesser contaminated water of Dolly Creek around the tailings area, discharging it into Little Grizzly Creek. Leachate water flowing from the tailings into Dolly Creek below the diversion would be treated by the constructed wetland. Without the full flow of Dolly Creek, the wetland size would be much smaller than needed for full treatment of leachate water, and the level of the aquifer now maintained at near the level of the sediment dam may drop during the drier season of the year, exposing more tailings material to oxygen and acid generation.

Alternatives 4 and 5 would reduce the release of copper to Dolly Creek by reducing the generation of acid within the tailings vadose zone. Much of the oxygen needed for the production of acid would be consumed by decomposing organic debris. The difference between these alternatives is the length of time for this process to become fully effective. Alternative 4 is expected to take much less time to become fully effective (approximately 10 years) than Alternative 5 (approximately 30 years).

Blowing sand and dust (containing crystalline silica particles) would be reduced or eliminated by implementing either Alternatives 4 or 5. Both alternatives would reduce or eliminate dust emanating from the site, but again, Alternative 4 would be expected to become fully effective much sooner than Alternative 5. Wind erosion control features would be installed with the implementation of either alternative. These devices are expected to reduce the transport of sand and the generation of dust to very low levels, but need to be replaced by plants for long-term success. Alternative 4 would require maintenance of these devices for approximately 10 years, while Alternative 5 would require approximately 30 years.

MOBILITY: The constituents of concern are sediment, blowing sand and dust, and metals in solution (copper and zinc). As discussed above, Alternatives 2 and 4 are expected to best control the release and transport of these constituents.

VOLUME: None of the alternatives reduce the volume of tailings material. All material would be treated on-site.

GENERAL DISCUSSION: As mentioned in the previous section, both Alternative 4 and 5 would reduce wind erosion and airborne contaminants. Vegetation growing over the tailings area is expected to reduce oxygen in the vadose zone of the tailings material by normal plant respiration processes as roots and other organic matter decomposes, thereby reducing the generation of acid and

mobilization of copper and zinc, the primary contaminants released from the site.

The wetland would be relied upon to extract soluble copper and zinc (plus other metals if released), transforming them into inert precipitates. Some of the metal contaminants would be taken up by the plants. The effectiveness of the wetland is expected to vary with the seasons and the amount of water required to be treated. Raising the elevation of the tailings dam about one foot may be needed to facilitate wetland establishment and size.

Stabilizing Dolly Creek is expected to reduce sediment production to acceptable levels or lower. This would reduce the release of copper and zinc from sediment to downstream areas.

Remediation of Air Quality. Concentrations of total crystalline silica are present in the tailings dust at levels of 19-23 percent. Silicosis, lung cancer, and secondary respiratory infections could result from repeated exposure to the dust. It is not known what the lower level of human exposure is, although respiratory effects are usually documented after occupational exposure to silica concentrations for several years. Expected results of implementing either Alternative 4 or 5 is the near total reduction of dust generated at the site. The near total reduction of fugitive dust at the site is expected to take approximately 10 years if Alternative 4 is implemented and 30 or more years with Alternative 5.

Remediation of Water Quality. Recent concentrations of copper and zinc at the compliance station for water quality (located downstream from the confluence of Dolly Creek with Little Grizzly Creek) ranged from 0.036 mg/L to).14 mg/L for copper and 0.0044 mg/L to 0.013 mg/L for zinc. The synergistic ffect of copper and zinc on aquatic biota is well documented. For this eason, the water quality goal at the compliance station has been established or copper plus zinc at a concentration not to exceed 0.01mg/L. Examining the ecent concentrations of copper and zinc, copper plus zinc has ranged from .040 mg/L to 0.15 mg/L. These concentrations are lowest during the high noff and winter (cold) months and highest during mid-summer months.

INTERACTION OF COPPER/ZINC AMOUNTS AFFECTED BY UPSTREAM ACTIVITY?

en though copper is required in animal metabolism, concentrations in fresh er above 0.01 mg/L (dependent on the alkalinity of the water) can have erse effects, especially to the young or juvenile forms of aquatic animals.

ernatives 2 and 3 include water treatment using a basic compost wetland, h is expected to remove copper and zinc from Dolly Creek to near background ls if properly maintained. Walker Mine, the primary source of copper to y Creek and Little Grizzly Creek for many years, was sealed in November, reducing copper and zinc levels in Dolly Creek above the tailings area to background levels during most of the year. Some copper is still released the site; not from the sealed tunnel, but rather the waste rock and inated soil areas at the mine and milling sites. This problem is ntly being addressed by the CVRWQCB and is expected to be remediated in ar future, possibly by 1995. The existing source of copper and zinc is te water that moves from the tailings material into Dolly Creek as it across the tailings area.

ADDED TO ACTIVITIES AT MINE SITE

Since the primary source of copper, the mine portal, has apparently been successfully treated, only the small amount of copper and zinc released from the tailings material and the mine site remains. The mine site will soon be treated. Passive water treatment using a wetland should successfully remove the remaining copper and zinc without specialized wetland treatment technology. .Periodic maintenance will require removing and treating contaminated soil, compost, and plant material and rejuvenating the wetland to its proper size and replacing lost compost and plant material. Structures designed to slow water movement will have to be replaced periodically, but should last longer than 30 years. Since iron is usually below the water quality objective of 1.0 mg/L and pH values are always near neutral, the use of an anoxic limestone drain for iron removal and neutralization is not warranted.

Proper wetland functioning also relies on active plant and bacterial metabolism, which is highest during the active growing season. This is also when the concentrations of copper and zinc in the receiving water are highest. Winter months will result in lower wetland activity and lower copper and zinc concentrations, because of dilution and lower activity of the mechanisms that cause release of the metals in the first place.

Revegetation of the tailings area will not only reduce wind erosion and the generation of fugitive dust, but it will also reduce the release of copper and zinc (and any other metals that could become mobilized over the years) by reducing the amount of oxygen in the vadose zone (the oxygenated zone between the top of the water table and the top of the tailings). This will reduce the release of copper and zinc to Dolly Creek and the amount of these metals to be removed by the wetland. An estimated reduction of metal mobility has not been made, but monitoring the several wells already installed in the tailings should give some indication of the relative changes in metal mobility achieved.

Short-Term Effectiveness

The implementation of Alternative 2 plus 4 is expected to have the greatest short-term effectiveness by treating all pathways and providing immediate reduction of respirable silica dust. Some particulate emissions is anticipated during the implementation of all alternatives, however, and proper respirators would be required to be worn by all workers whenever dust conditions warrant.

Implementability

Alternative 3 treatments are the same as Alternative 2 with the addition of the diversion works. This is an additional construction and maintenance complication.

Alternative 4 and 5 require similar wind erosion control features and installation requirements. Alternative 4 revegetation would be the simplest to conduct. Alternative 5 would require importing soil and construction of islands, mulch, and vegetation. The location of these islands would be critical for aiding the spread of plants to adjacent areas.

All alternatives use proven techniques and readily available services and materials.

The implementation of Alternative 3 with Alternative 5 would be the most complex to construct and maintain. The simplest treatment would be the implementation of Alternative 2 alone with institutional controls.

Cost

Alternative 2 alone has the lowest capital cost and Operation and Maintenance (O&M), but doesn't provide full site treatment and long-term effectiveness. The implementation of either Alternative 4 or 5 with either Alternative 2 or 3 would provide full treatment of the site. Mixing Alternative 2 with Alternative 4 would require a lower capital cost than mixing Alternative 2 with Alternative 5. The use of Alternative 3 would greatly increase the cost of treating the site, both in its capital cost and O&M cost. Additional work and expense could be required if revegetation doesn't meet expectations, increasing O&M costs over the estimates.

Combining Alternatives 2 and 4, provides the best overall effectiveness proportional to costs. The following table compares values and costs of each alternative. Refer to the Feasibility Study for a more detailed discussion.

ALTERNATIVE	30-YEAR NET VALUE	CAPITAL COST	O&M COST
1	$0	$0	$8,000
2	$81,000	$240,000	$8,400
3	-$21,000	$1,544,000	$20,400
4	$63,000	$180,000	$4,200
5	$42,000	$330,600	$1,400

State Acceptance

The State does not accept the No Action alternative. No "cease-and-desist order" for the site has been imposed on the Forest Service, but has been mentioned. Through conversations with State personnel, the CVRWQCB favors those alternatives that more completely treat the site and as quickly as possible. They favor most the proposed plan, discussed in section X, below.

Community Acceptance

Very few responses were received from the public. Of the responses received, most were informal and favored implementation of the proposed plan. No formal response was received from those who oppose work at the site. Through informal channels, it was learned that several people who use the site for off-highway vehicle recreation would prefer that the site remain as it is and that it remain open for their use.

Table 3 summarizes the advantages and disadvantages of each alternative.

The Proposed Treatment Plan and Modifications

The assembled remedial action alternatives represent a range of distinct waste management strategies which address human health and environmental concerns associated with the site. They build on one another, enhancing each other,

except the no action alternative. The ability of each alternative to meet ARARs and the other evaluation criteria, discussed in the previous section, was evaluated.

Alternative 2 was selected in combination with Alternative 4 (Channel Erosion Control and Development of a Wetland for Passive Water Treatment + Revegetation and Wind Erosion Control) as the "preferred treatment". By analyzing the alternatives using the evaluation criteria discussed in the previous section, Alternative 2 plus Alternative 4 were determined to permanently treat the entire site and best meet the remediation goals and objectives discussed in Section VIII in a timely and cost-effective manner. These alternatives also have the support of the State agencies overseeing these matters, the local communities, and most PRPs.

Selected Remedy

Because little rejection of the proposed treatment plan was received and no new information was introduced, no modifications to the proposed plan are made.

Because hazardous substances will remain at the site at levels above that allowed for unlimited use and unrestricted exposure, the Forest Service, in cooperation with the CVRWQCB, will review the remedial action no less often than every five years after initiation of the selected remedial action [(40 CFR 300.430, paragraph (f)(4)(ii) and (f)(5)(iii)(C)].

TABLES

WALKER MINE TAILINGS TOTAL METALS CONCENTRATIONS

SAMPLE	FOOTAGE	LITHOLOGY	pH	SULFATE	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe
			pH UNIT	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TTLC					500	500	10000	75	100	2500	8000	2500	
STLC					15	15	100	0.75	1.0	5	80	25	
DETECTION	WATER	mg/l	0.1	2.0	0.30	0.20	0.05	0.02	0.02	0.05	0.05	0.02	0.10
LIMIT	SOIL	mg/kg	0.1	2.0	15	10	2.5	1.0	2.0	2.5	2.5	1.0	2.5
W-1	10	O	4.5	62	ND	13	2000	ND	ND	2.6	11	480	42000
W-2	15	U	6.6	20	ND	15	1700	ND	ND	3.0	11	380	38000
W-3	15	U	7.8	29	ND	26	2100	ND	ND	3.4	17	1600	43000
W-4	15	O	4.5	80	18	16	1400	ND	ND	5.5	23	2700	52000
W-5	6	O	4.3	22	ND	27	2000	ND	ND	2.7	11	1100	35000
W-6	12.5	U	7.8	54	ND	ND	2700	ND	ND	2.6	12	660	41000
W-7	5	S	6.9	3.4	ND	17	60	ND	ND	2.8	7.7	20	8000
101	6	O	4.4	31	ND	ND	2000	ND	ND	ND	8.9	760	40000
101	10	O	4.1	58	ND	ND	1900	ND	ND	4.1	8.1	460	39000
101	15	O	4.2	67	16	ND	2200	ND	ND	3.8	7.3	730	37000
102	10	U	7.3	19	18	13	1400	ND	ND	ND	12	2000	32000
103	15	U	7.5	50	ND	ND	2300	ND	ND	ND	14	630	47000
104	25	S	7.7	8.3	ND	27	340	ND	ND	28	15	62	47000
105	5	U	7.7	38	ND	ND	3400	ND	ND	3.5	13	590	36000
106	15	U	5.7	140	ND	42	2800	ND	ND	5.3	18	720	37000
107	10	U	8.1	19	ND	24	2800	ND	ND	ND	11	550	28000
W-3	QA/QC	WATER	1.6*	3.1	ND	ND	0.66	ND	ND	ND	ND	0.36	7.7

O = OXIDE TAILINGS

U = UNOXIDIZED TAILINGS

S = SOIL

GS = GRANITIC SOIL

DG = DECOMPOSED GRANITE

* = WATER SAMPLE PRESERVED WITH HNO3

1000 EXCEED 10 TIMES STLC

EXCEED TTLC

STLC = SOLUBLE THRESHOLD LIMIT CONCENTRATION

TTLC = TOTAL THRESHOLD LIMIT CONCENTRATION

ND = NON DETECT

Grab samples were taken and field tests made at five of the six prescribed sampling sites. Sample site R-6 was dry. All samples were tested in certified laboratories using the techniques prescribed in the Waste Discharge Requirements, Order No. 91-017. Water discharge, water and air temperature, specific conductance, and pH were measured in the field at the time of sampling. Test results are as follows:

Receiving Water Constituent	MAY, 1993 ----Stations---- R-1	R-2	R-3	R-4	R-5	R-6	Limitations
Discharge (cubic feet/sec.)	7.28	7.28	39.6	44.7	46.1	0.00	
Air Temperature (°C)	12	10	8	14	11		
Water Temperature (°C)	9	14	7	9	10		
Conductivity (micromhos/cm)	60	80	40	4	40		
pH (pH units)	7.6	7.8	7.4	7.7	7.6		6.5-8.5
Hardness (CaCO3) (mg/l)	25	28	18	16	17		
Alkalinity (CaCO3) (mg/l)	32	30	24	22	22		
Acidity (CaCO3)	1	1	1	1	3		
Suspended Solids (mg/l)	9.2	84.0	0.8	3.2	16.8		
Settleable Solids (mg/l)	<0.1	<0.1	<0.1	<0.1	<0.1		
Turbidity (NTU)	0.10	0.25	0.05	0.15	0.05		0.20
Bicarbonate (mg/l)	39	36	29	27	27		
Calcium (mg/l)	5.1	6.6	4.7	3.8	4.2		
Carbonate (mg/l)	<1	<1	<1	<1	<1		
Chlorides (mg/l)	<0.5	<0.5	<0.5	<0.5	<0.5		
Magnesium (mg/l)	2.9	2.8	1.5	1.5	1.6		
Potassium (mg/l)	0.8	1.0	0.6	0.7	0.7		
Nitrate as N (mg/l)	<1.0	<1.0	<1.0	<1.0	<1.0		
Sodium (mg/l)	1.9	2.1	2.2	2.4	2.2		
Sulfates (mg/l)	0.5	4.0	<0.5	<0.5	<0.5		
Dissolved Solids (mg/l)	42	56	32	29	37		

WALKER MINE TAILINGS TOTAL METALS CONCENTRATIONS

SAMPLE	FOOTAGE	LITHOLOGY	pH	SULFATE	Pb	Hg	Mo	Ni	Se	Ag	Th	V	Zn
			pH UNIT	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/k
TTLC					1000	20	3500	2000	100	500	700	2400	5000
STLC					5.0	0.2	350	20	1.0	5	7.0	24	250
DETECTION LIMIT	WATER	mg/l	0.1	2.0	0.10	0.0002	0.05	0.05	0.30	0.02	0.40	0.05	0.05
	SOIL	mg/kg	0.1	2.0	5.0	0.05	2.5	2.5	15	1.0	20	2.5	5.0
W-1	10	O	4.5	62	72	0.17	ND	4.2	ND	2.5	ND	36	77
W-2	15	U	6.6	20	38	0.28	ND	ND	ND	1.2	ND	33	90
W-3	15	U	7.8	29	94	0.44	ND	3.5	ND	3.0	ND	41	86
W-4	15	O	4.5	80	400	1.3	ND	3.0	ND	1.7	143	53	200
W-5	6	O	4.3	22	140	0.59	ND	ND	ND	4.6	ND	38	72
W-6	12.5	U	7.8	54	78	0.25	ND	ND	ND	1.6	ND	33	77
W-7	5	S	6.9	3.4	ND	ND	ND	2.8	ND	ND	ND	14	25
101	6	O	4.4	31	54	0.17	ND	ND	ND	4.8	ND	34	49
101	10	O	4.1	58	54	0.18	ND	ND	ND	3.2	ND	33	67
101	15	O	4.2	67	23	0.27	ND	ND	ND	4.7	ND	30	49
102	10	U	7.3	19	87	0.18	4.0	ND	ND	5.1	ND	28	91
103	15	U	7.5	50	54	0.40	ND	3.0	ND	2.3	ND	43	78
104	25	S	7.7	8.3	15	ND	ND	15	ND	ND	ND	97	66
105	5	U	7.7	38	110	0.41	ND	2.9	ND	1.6	ND	34	78
106	15	U	5.7	140	120	0.21	ND	5.4	ND	2.3	ND	41	300
107	10	U	8.1	19	110	0.29	ND	ND	ND	1.9	ND	31	73
W-3	QA/QC	WATER	1.6*	3.1	ND	ND	ND	ND	ND	ND	ND	ND	0.19

O = OXIDE TAILINGS

U = UNOXIDIZED TAILINGS

S = SOIL

GS = GRANITIC SOIL

DG = DECOMPOSED GRANITE

* = WATER SAMPLE PRESERVED WITH HNO3

1000 EXCEED 10 TIMES STLC

1000 EXCEED TTLC

STLC = SOLUBLE THRESHOLD LIMIT CONCENTRATION

TTLC = TOTAL THRESHOLD LIMIT CONCENTRATION

ND = NON DETECT

Receiving Water Constituent	----Stations[1]--- R-1	R-2	R-3	R-4	R-5	R-6	Limitations
Chromium (ug/l)	<10	<10	<10	<10	<10		
Arsenic (ug/l)	<10	<10	<10	<10	<10		
Mercury (ug/l)	<1	<1	<1	<1	<1		2.4
Selenium (ug/l)	<5	<5	<5	<5	<5		
Aluminum (mg/l)	ND	0.16	ND	ND	ND		0.750
Antimony (mg/l)	ND	ND	ND	ND	ND		
Cadmium (mg/l)	ND	ND	ND	ND	ND		0.0053[2]
Chromium (mg/l)	ND	ND	ND	ND	ND		
Copper (mg/l)	0.11	0.37	ND	ND	0.036		0.0034[2]
Iron (mg/l)	0.09	0.59	0.06	0.06	0.11		1.00
Lead (mg/l)	ND	ND	ND	ND	ND		0.010[2]
Manganese (mg/l)	ND	0.11	ND	ND	ND		
Nickel (mg/l)	ND	ND	ND	ND	ND		
Silver (mg/l)	ND	ND	ND	ND	ND		
Thallium (mg/l)	ND	ND	ND	ND	ND		
Zinc (mg/l)	0.0080	0.0240	0.0063	0.0026	0.0044		0.026[2]
Dissolved Organic Carbon (mg/l)	2.2	2.0	2.3	2.2	2.4		

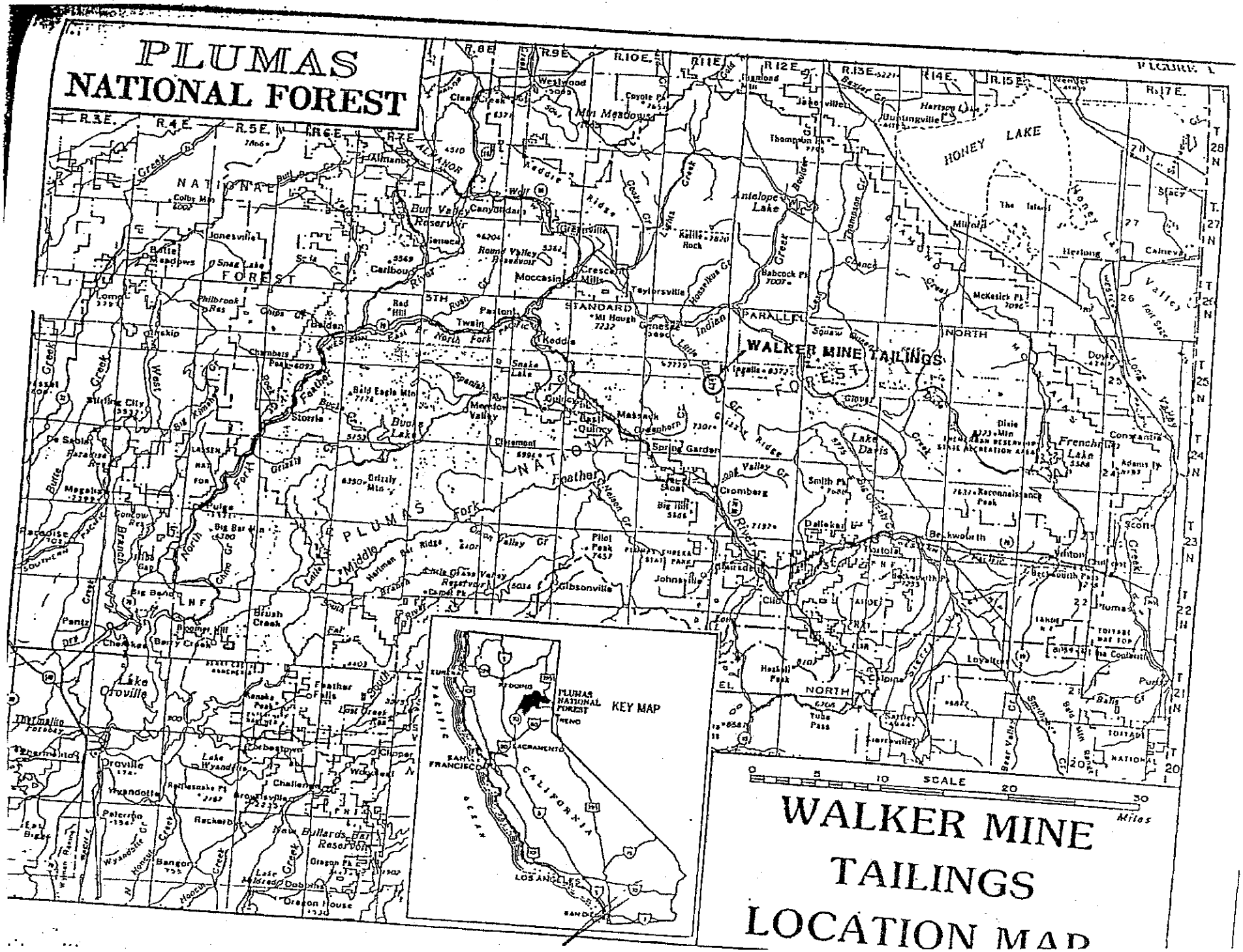
1. R-3 is the background station located above the tailings area on Little Grizzly Creek. R-5 is the Waste Discharge Requirement(WDR) compliance station and is located downstream from the confluence of Dolly Creek and Little Grizzly Creek near Brown's Cabin.

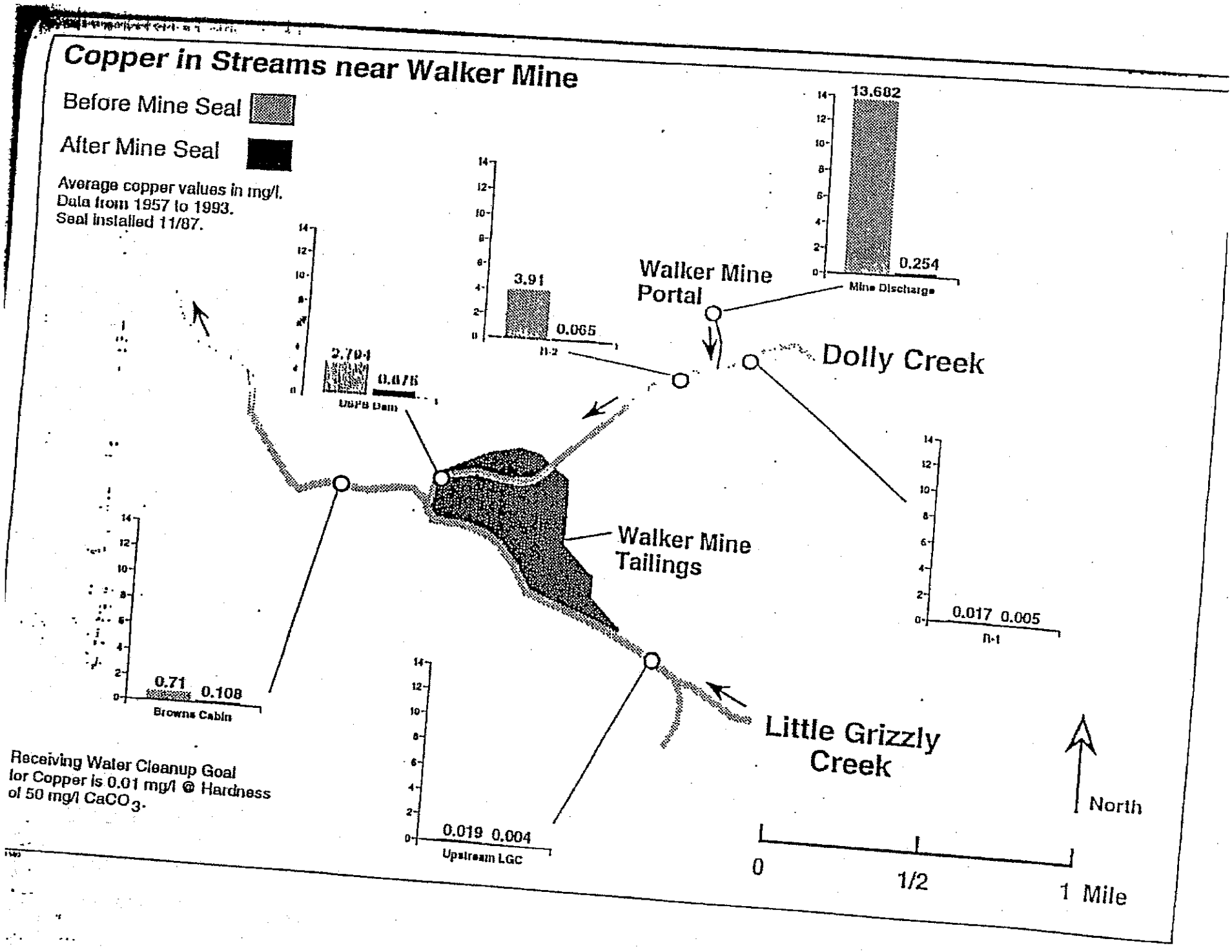
2. The compliance value for cadmium, copper, lead, and zinc is calculated with hardness from background station R-3 .

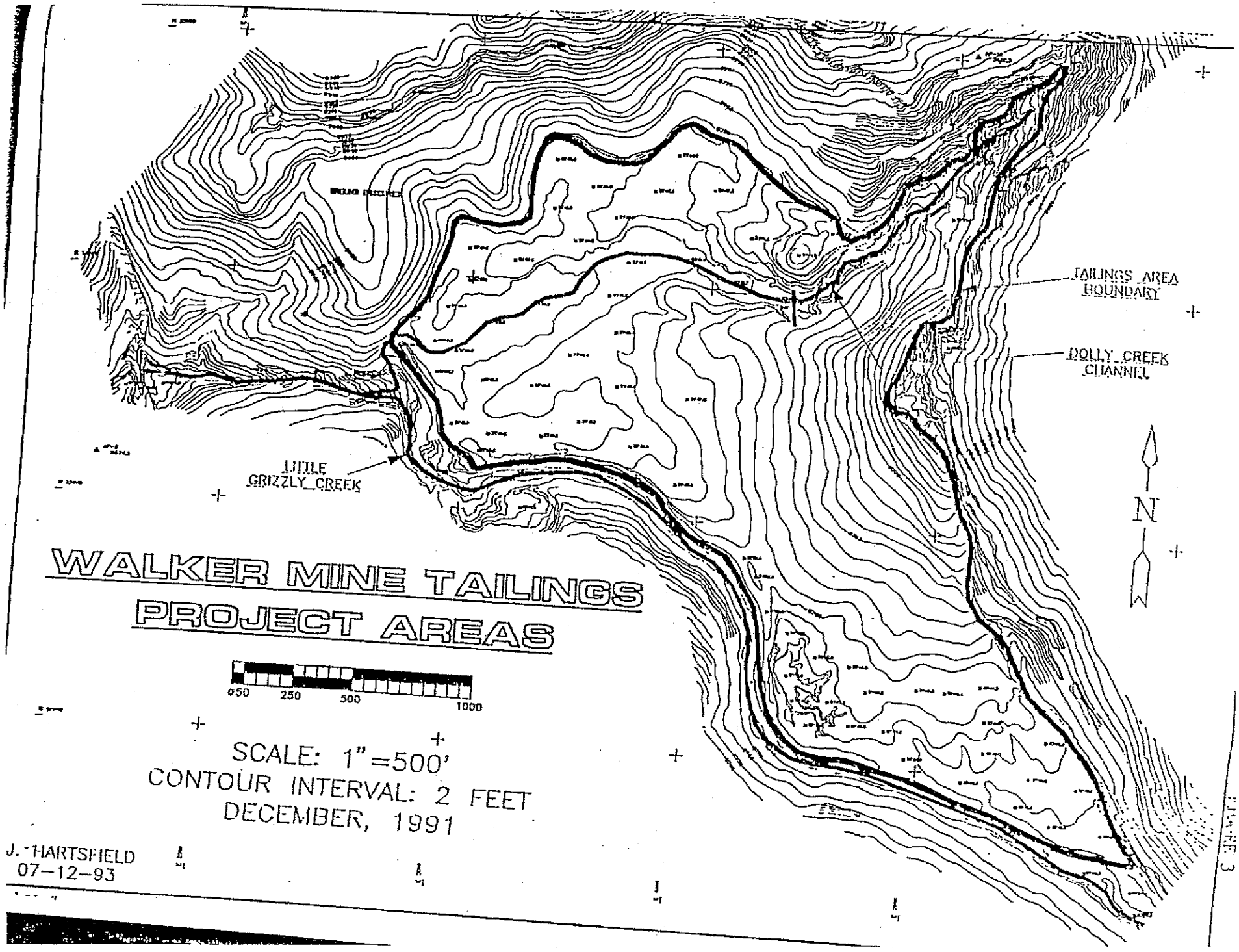
TABLE

SUMMARY OF DETAILED ANALYSIS OF TREATMENT ALTERNATIVES FOR THE WALKER MINE TAILINGS

EVALUATION CRITERIA	ALTERNATIVE 1: NO ACTION	ALTERNATIVE 2: CHANNEL STABILITY + WETLAND	ALTERNATIVE 3: ALT 2 + DIVERSION OF DOLLY CREEK	ALTERNATIVE 4: REVEGETATE + WIND EROSION CONTROL	ALTERNATIVE 5: VEG. SO ISLANDS +EROSION CONTR
1. Overall Protection of Human Health and the Environment	No action taken. Not considered to be protective of human health and the environment	Would not reduce human health risks, but would reduce the release of copper to environment.	Would not reduce human health risks, but would reduce the release of copper to environment.	Would reduce human health risks, but would only aid in the reduction of Cu release to environment.	Would reduce human hea risks, but would only a in the reduction of Cu release to environment.
2. Compliance with ARARs	No action taken. Not considered to be in compliance with ARARs.	Both physical and chemical water quality requirements would be met. Would not reduce human health risks.	Both physical and chemical water quality would be met. Would not reduce human health risks.	Would only aid in meeting water quality ARARs. Would reduce human health risks from inhalation of silica dust.	Would only aid in meeti water quality ARARs. Would reduce human healt risks from inhalation of silica dust.
3. Reduction of Toxicity, Mobility, and Volume through Treatment	No action taken. Not considered to reduce toxicity, mobility, or volume of hazardous material.	Copper release would be reduced to acceptable level. Sediment release would be minimal. Would not reduce the release of air borne silica dust.	Copper release would be reduced to acceptable level. Sediment release would be minimal. Would not reduce the release of air borne silica dust.	Would reduce copper in the leachate draining to the wetland to an unknown level within 10 years. Would reduce air borne contaminants to acceptable levels within 10 years.	Would reduce copper in leachate draining to the wetland to an unknown level within 30 years. Would reduce air borne contaminants to acceptable levels within 30 years.
4. Short and Long-term Effectiveness	No action take. Not considered to reduced environmental impacts or risks of exposure	Potential risk to workers from silica dust inhalation reduced by use of protective equipment. Long-term monitoring and maintenance would insure good channel stability and wetland functioning.	Potential risk to workers from silica dust inhalation reduced by use of protective equipment. Long-term monitoring and maintenance would insure good diversion ditch, channel and wetland functioning.	Potential risk to workers from silica dust inhalation reduced by use of protective equipment. Long-term monitoring and maintenance would insure success of revegetation.	Potential risk to workers from silica dust inhalation reduced by use of protective equipment. Long-term monitoring and maintenance would insure success of revegetation.
5. Implementability	No action taken. Water monitoring would still occur.	State-of-the-art techniques would be used. No special permits or labor would be required.	State-of-the-art techniques would be used. The diversion ditch would follow standard engineering protocol. No special permits or labor would be required.	Locally available material would be used for wind erosion control. Native plants adapted to the site would be planted Planting should be phased over 3 years. Full site occupation would take 10 years.	Locally available material would be used for wind erosion control. Native plants adapted to site would be planted onto islands of imported soil. Planting would take place in a single year if funded Full site occupation would take 30 years.
6. Cost	No action taken. Cost to monitor water quality only.	$240,000 capital cost $8,400 annual O&M	$1,554,000 capital cost $20,400 annual O&M	$180,000 capital cost $4,200 annual O&M	$330,600 capital cost $1,400 annual O&M
7. Degree of Regulatory Acceptance	Low	Acceptable	Acceptable	Acceptable	Acceptable


PLUMAS
NATIONAL FOREST
WALKER MINE TAILINGS
KEY MAP
PLUMAS NATIONAL FOREST
SCALE
0 5 10 20 30
Miles
WALKER MINE
TAILINGS
LOCATION MAP


Copper in Streams near Walker Mine
Before Mine Seal
After Mine Seal
Average copper values in mg/l.
Data from 1957 to 1993.
Seal installed 11/87.
13.602
0.254
Mine Discharge
Walker Mine
Portal
3.91
0.065
Dolly Creek
2.794
0.075
Walker Mine
Tailings
0.017 0.005
0.71 0.108
Browns Cabin
0.019 0.004
Upstream LGC
Little Grizzly
Creek
Receiving Water Cleanup Goal
for Copper is 0.01 mg/l @ Hardness
of 50 mg/l CaCO3.
North
0
1/2
1 Mile



WALKER MINE TAILINGS PROJECT AREAS

SCALE: 1"=500'
CONTOUR INTERVAL: 2 FEET
DECEMBER, 1991

J. HARTSFIELD
07-12-93

FIGURE 3

APPENDIX

United States Department of Agriculture | For t Service | SO

Reply to: 2110/2120

Date: July 1, 1993

Subject: Public Meetings to Present Proposed Treatments at the Walker Mine Tailings

To: District Ranger, Beckwourth RD

Two meetings were held to receive comments and concerns from the community regarding proposed treatments for the Walker Mine Tailings. This letter documents the outcome of those meetings.

The meetings were conducted by representatives from the Forest Service, the Central Valley Regional Water Quality Control Board, and the Plumas Corporation.

The first meeting was held June 23 in Taylorsville. Taylorsville is located on Indian Creek downstream from Little Grizzly Creek and the Walker Mine Tailings. The reason for selecting Taylorsville for the meeting place was to solicit comments from those people most affected by changes in water quality due to the proposed treatments at the tailings area.

Two people attended the meeting, one from the community and one outside. The person from the community was concerned that the site may be mined in the future, destroying treatments implemented at the site. He believes that we should treat the site as soon as possible.

The second person expressed concern that any treatments implemented at the site at this time not preclude future treatments as technology advances and more permanent treatments are made available. Upon review of the proposed treatments, his concerns were satisfied. The proposed treatments would not preclude such treatments if they prove reliable and economical.

The second meeting was held June 30 in Portola. Portola was chosen for this meeting to solicit comments and concerns from Off Highway Vehicle (OHV) users who may be frequenting the site and who would be concerned about the site being closed to their use. Over 200 letters were sent out prior to the meetings to interested parties, including a large OHV constituency, to coax them into attending one of the meetings. The meetings were also announced in the local newspapers.

Three members of the community attended the second meeting plus two people from the Plumas County Health Department. Three concerns surfaced. There was a concern that future technologies not preclude future treatments. A tag on concern is that future treatments should provide a boost to the local economy, specifically Portola.

United States Department of Agriculture | Forest Service | SO

Reply to: 2110/2120

Date: September 27, 1993

Subject: Phone Conversation with Mr. Archie Sparkman

The following key points were discussed with Mr. Archie Sparkman, one of the claimants of the Walker Mine Tailings and a Potentially Responsible Party (PRP). He spoke for himself and the other claimants.

1. The assessment taxes haven't been paid for three years.

2. He and Buzz Lally are retired and were talked into this venture.

3. No work as been performed at the site. They've never performed any work at the site.

4. They are okay with the Forest Service proposal. He doesn't know anything about that type of work anyway.

5. He considers himself and the others as having dissolved their interest in the site three years ago.

Terry A. Benoit

TERRY A. BENOIT
Forest Hydrologist

The third concern expressed by the County Heal Department representatives over the potential health hazardous of workers and the public exposed to dust from the tailings area. The County Health Department was unaware that the public was using the area for OHV play and they expressed an opinion that the area be posted with health warning signs.

Because dialogue concerning the closure of the site to OHV use did not occur at either of the meetings, and because it is assumed that some OHV users will ignore signs and gates warning of the health risks and need to stay off the site, an information brochure was suggested. The brochure could be made available to all users of the site, including those who violate closure signs and gates.

No other comments were received and it is assumed that we have acceptance from the majority of the local communities.

Terry A. Benoit

TERRY A. BENOIT
Forest Hydrologist

United States Department of Agriculture | Forest Service | SO

Reply to: 2110/2120

Date: January, 1994

Subject: Documentation of Public and Agency Acceptance of Proposed Remediation Walker Mine Tailings Remediation Project

To: Files

PUBLIC RESPONSE. All formal response was received at the two public meetings and over the phone. I was able to gather information through other sources about how other people felt about the proposed project for Walker Mine Tailings. Except for Off-highway Vehicle (OHV) users who use the site, most people are in favor of the proposal. The primary people in favor live downstream of the tailings area and near Genessee. The OHV recreationists have expressed a desire that the area be left a playground and that no restrictions be placed on use of the area.

AGENCY RESPONSE. The primary agency we are dealing with in the treatment of the site is the Central Valley Regional Water Quality Control Board (CVRWQCB). Mr. William Croyle, Water Quality Engineer working for the Board, is my primary contact. Through him I have learned that the CVRWQCB is okay with the preferred treatment plan (Alternative 2 + Alternative 4). They are most interested in our attempt to show a good faith effort with good science.

Our attempt to obtain a formal response from them regarding their acceptance of the proposed treatment plan resulted in no response. We attempted to solicit their approval/disapproval by asking for criticism of the Proposed Plan.

No other responses have been received, except from miners who always seem to have a new and innovative approach to our problem and, it just so happens, to their gain.

TERRY A. BENOIT
Forest Hydrologist

Exhibit 43

RECORD OF DECISION AMENDMENT

FOR REMEDIATION OF THE

WALKER MINE TAILINGS,

BECKWOURTH RANGER DISTRICT, PLUMAS NATIONAL FOREST

July 2001

RECORD OF DECISION AMENDMENT

FOR REMEDIATION OF THE

WALKER MINE TAILINGS,

BECKWOURTH RANGER DISTRICT, PLUMAS NATIONAL FOREST

July 2001

PREPARED BY: Terry A. Benoit — July 18, 2001

TERRY A. BENOIT
Forest Hydrologist
Beckwourth Ranger District,
Plumas National Forest
USDA Forest Service

Date

RECOMMENDED BY: _____ _____

ANGIE DILLINGHAM
District Ranger
Beckwourth Ranger District
Plumas National Forest
USDA Forest Service

Date

RECOMMENDED BY: Mark J. Madrid — 7/18/01

MARK J. MADRID
Forest Supervisor
Plumas National Forest
USDA Forest Service

Date

APPROVED BY: Melroy H. Teigen — 8/02/01

MELROY H. TEIGEN
Director, Engineering
Pacific Southwest Region
USDA Forest Service

Date

RECORD OF DECISION AMENDMENT

FOR REMEDIATION OF THE

WALKER MINE TAILINGS,

BECKWOURTH RANGER DISTRICT, PLUMAS NATIONAL FOREST

July 2001

PREPARED BY:

TERRY A. BENOIT
Forest Hydrologist
Beckwourth Ranger District,
Plumas National Forest
USDA Forest Service

Date

RECOMMENDED BY:

Angela Dillingham

ANGIE DILLINGHAM
District Ranger
Beckwourth Ranger District
Plumas National Forest
USDA Forest Service

7-24-01
Date

RECOMMENDED BY:

MARK J. MADRID
Forest Supervisor
Plumas National Forest
USDA Forest Service

Date

APPROVED BY:

MELROY H. TEIGEN
Director, Engineering
Pacific Southwest Region
USDA Forest Service

8/02/01
Date

RECORD OF DECISION AMENDMENT

FOR REMEDIATION OF THE

WALKER MINE TAILINGS,

BECKWOURTH RANGER DISTRICT, PLUMAS NATIONAL FOREST

July 2001

TABLE OF CONTENTS

Section I: THE DECLARATION

A. Site Name and Location

The name of the site is the Walker Mine Tailings (Site). Located within Plumas County, California, the Site is on National Forest System lands under the jurisdiction, custody or control of the United States Department of Agriculture, Forest Service (Forest Service) in the Plumas National Forest.

B. Statement of Basis and Purpose

This decision document, called a Record of Decision Amendment (ROD Amendment), presents the Forest Service's Amended Selected Remedy for the Site, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601, *et seq.*, and, to the extent practicable, the National Contingency Plan (NCP). The ROD Amendment is based on the Administrative Record for the Site.

C. Assessment of the Site

Actual or threatened releases of hazardous substances at or from this Site, if not addressed by implementing the response action selected in the Record of Decision, as modified by this ROD Amendment, may present an imminent and substantial endangerment to public health, welfare, or the environment.

D. Description of the Amended Selected Remedy

This ROD Amendment modifies the Selected Remedy for the Site presented in the Record of Decision, which was signed on June 10, 1994. The modification affects the cleanup technologies selected in the 1994 Record of Decision. The impetus for this modification is the new information obtained by the Forest Service in its five-year review, which was conducted in 1999.

The Amended Selected Remedy provides for the remedial changes summarized in Table 1-1.

Table 1-1 AMENDED SELECTED REMEDY ROD AMENDMENT (2001)	
Remedial Change	
Dolly Creek	Diversion and Control of Dolly Creek Around the Tailings, and Monitoring of the Effectiveness of the Diversion and Control of Dolly Creek in Achieving Water Quality Standards (ARARs); and Reconstruction of 1,500 Feet of Upper Dolly Creek Channel to a Stable Geometry and Revegetation of Its Banks (*a component of the original Selected Remedy in the 1994 Record of Decision*)
	Completing the Construction of a 15-Acre Passive Water Treatment System in the Lower Portion of Dolly Creek as a Contingency Remedy (*a component of the original Selected Remedy in the 1994 Record of Decision*)
Little Grizzly Creek	Diversion of Little Grizzly Creek as a Contingency Remedy
Tailings	Neutralization of 10 Acres of Low pH Material with Crushed Limestone, and Revegetation of Tailings Area (*a component of the original Selected Remedy in the 1994 Record of Decision*)
General	Closure of the Site to Public Access When Necessary to Protect Treatment Features (*a component of the original Selected Remedy in the 1994 Record of Decision*)

The Amended Selected Remedy modifies the original Selected Remedy. This Amended Selected Remedy provides for the diversion and control of Dolly Creek around the tailings, and monitoring of the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards (Applicable or Relevant and Appropriate Requirements (ARARs)). In specific, water flowing through the upper Dolly Creek channel above the confluence of Dolly Creek and Little Grizzly Creek would be diverted around the tailings through the construction of a diversion dam, a control gate, and a ditch or other means of diversion. This diversion ditch would divert relatively clean water from upstream of the tailings around the tailings area.

A water monitoring program would be conducted to evaluate the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards. Under the Amended Selected Remedy, if, at the end of an initial three-year monitoring period, the diversion and control of Dolly Creek without a passive water treatment system achieves water quality standards, no further work would be done to construct an anaerobic wetland immediately downstream of the aerobic wetland built in 1994. As part of an ongoing monitoring program, the necessity of the passive water treatment system would be re-evaluated every five years for the next 25 years after the initial three-year monitoring period.

In addition, the remaining portions of three components of the original Selected Remedy would be implemented as part of the Amended Selected Remedy. As provided for in the original Selected Remedy, 1,500 feet of upper Dolly Creek channel would be reconstructed to a stable geometry and the creek banks would be revegetated. Also, in the 100-acre tailings area, 10 acres of low pH material would be neutralized with crushed limestone, and 60 acres would be re-vegetated with grasses, shrubs, and trees. In addition, the Site would be closed to public access when necessary to protect treatment features.

The Amended Selected Remedy incorporates two *contingency* remedies in the event that the diversion and control of Dolly Creek is not effective in achieving water quality standards. The first contingency remedy provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as called for in the original Selected Remedy. This contingency remedy involves the construction of the remaining portion of the passive water treatment system —an anaerobic wetland— to treat leachate water by reducing heavy metals, specifically, copper and zinc, before the contaminated water reaches Little Grizzly Creek below the confluence with Dolly Creek. Residual heavy metals discharge from the Walker Mine would pass to Little Grizzly Creek by means of the Dolly Creek diversion. Currently, heavy metals are released from the Walker Mine during high spring run-off conditions. The first contingency remedy would work in tandem with the Dolly Creek diversion and control.

The second contingency remedy provides for the diversion of Little Grizzly Creek to optimize the treatment capacity of the passive water treatment system, if the first contingency remedy is implemented. A sufficiently high water table is necessary for the functioning and survival of the passive water treatment system because anaerobic wetlands require a constant supply of water to support an environment low in oxygen. Potentially, the water elevation could drop during dry periods to a level that is too low to support the anaerobic wetland. Consequently, the water elevation must be sustained above the ground surface. If the diversion of Little Grizzly becomes necessary, this contingency remedy entails the diversion of Little Grizzly Creek, above the confluence with Dolly Creek, to the anaerobic wetland. The diversion would operate during low flow conditions in summer months, and it would divert only the water needed to increase the water table elevation to maintain the anaerobic wetland. The second contingency remedy would work in conjunction with the Dolly Creek diversion and the first contingency remedy.

As part of the water monitoring program, data would be collected to determine the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards, namely, ARARs. These data also would be used to determine operating requirements for the diversion and to evaluate the effects of the diversion on ground water levels. As part of this water monitoring program, water data would be collected at the downstream station on Dolly Creek (R-2) and at the compliance station (R-5) below the confluence of Dolly Creek and Little Grizzly Creek, with an additional station upstream of station R-2 at the Dolly Creek diversion outlet.

E. Statutory Determinations

The Amended Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

A statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment because this remedy will result in hazardous substances remaining on-site above levels that allow for unlimited use and unrestricted exposure.

F. ROD Amendment Data Certification Checklist

The following information is included in the Decision Summary section of this ROD Amendment:

- contaminants of concern and their respective concentrations (1994 ROD, p. 3, Figure 2 (Copper in Streams near Walker Mine));
- baseline risk represented by the contaminants of concern (1994 ROD, pp. 7-8);
- cleanup levels established for contaminants of concern and the basis for these levels (1994 ROD, pp. 8-10);
- how source materials, namely, the tailings, constituting principal threats are addressed (ROD Amendment, Section II.D (Description of New Alternatives));
- current and reasonably anticipated future land use assumptions and current and potential beneficial uses of ground water used in the baseline risk assessment, the 1994 Record of Decision, and the ROD Amendment (1994 ROD, pp. 5-6);
- estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the amended remedy cost estimates are projected (ROD Amendment, Section II.G.3 (Summary of the Estimated Remedy Costs)); and
- key factors that led to selecting the amended remedy (ROD Amendment, Section II.C. (Basis for the ROD Amendment)).

Additional information can be found in the Administrative Record for the Site.

G. **Authorizing Signature**

MELROY H. TEIGEN
Director, Engineering
Pacific Southwest Region
USDA Forest Service

DATE

G. **Authorizing Signature**

MELROY H. TEIGEN
Director, Engineering
Pacific Southwest Region
USDA Forest Service

8/02/01
DATE

Section II: DECISION SUMMARY

A. Introduction to the Site and Statement of Purpose

The Walker Mine Tailings (Site) is located on National Forest System (NFS) lands roughly 15 miles east of the community of Quincy in Section 12, T24N, R11E; and Sections 7 and 18, T24N, R12E, Mt. Diablo Baseline and Meridian, within Plumas County, California. The Site is approximately three-quarters of a mile southwest of the Walker Mine at the confluence of Dolly Creek and Little Grizzly Creek. Situated on private land, the Walker Mine is the source of the tailings material disposed of on NFS lands at the Site. Figures 2-1 and 2-2 depict the location and project areas of the Site, respectively. (All figures can be found at the end of this document.) A more complete description of the Site may be found in the 1994 Record of Decision, which is explained below (1994 ROD, pp. 3-4).

The United States Department of Agriculture, Forest Service (Forest Service) is the lead agency for the Site. The California Regional Water Quality Control Board, Central Valley Region (Water Board), and the United States Environmental Protection Agency (U.S. EPA) are support agencies. The Water Board is the lead agency for the Walker Mine.

As the lead agency for the Site, the Forest Service has complied with Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9617, and the National Contingency Plan (NCP) § 300.435(c)(2)(ii) in preparing this ROD Amendment.

The Forest Service signed the Record of Decision on June 10, 1994, which presents the Selected Remedy for the Site. In 1999, the Forest Service conducted its five-year review, which is documented in a report entitled, "Analysis of Surface Water Quality at the Walker Mine Tailings, Forest Service, Plumas National Forest, Beckwourth Ranger District, 1986-1999" (Appendix 1). As a result of this five-year review, the Forest Service obtained new information since the 1994 Record of Decision. The new information is discussed in detail in the section, "Basis for the ROD Amendment," of the Decision Summary. In light of the new information, the Forest Service determined that it was necessary to amend the 1994 Record of Decision in this ROD Amendment.

This decision is based on the Administrative Record for the Site. The ROD Amendment will become part of the Administrative Record. The Administrative Record is kept on file in the Watershed Office of the Plumas National Forest Supervisor's Office at 159 Lawrence Street, Quincy, California. The Administrative Record is available for review by appointment during normal business records by contacting the Forest Service's On-Scene Coordinator (OSC) at 530-283-2050.

B. Site History, Contamination, and Selected Remedy

The Walker Mine produced significant quantities of copper and minor amounts of gold and silver from 1915 to 1941. Located on private land, the Walker Mine has remained idle since 1941 with the exception of sporadic exploration activities. In connection with the 1915-41 period, mill operations generated numerous tailings that flowed downstream by gravity to a tailings pond and a small sediment retention dam about three-quarters of a mile from the Walker Mine. Much of the free water from the milling process evaporated, leaving a well-distributed pile of fine-grained, sandy, silty, and clay-like tailings material covering a 100-acre area to an average depth of 28 feet. These tailings are situated on NFS lands administered by the Forest Service.

The Walker Mine has a long history of water pollution as a result of acid mine drainage and heavy metals discharge (copper, iron and zinc) from the mine. Contaminants were released into nearby waters, Dolly Creek and Little Grizzly Creek, through a variety of pathways, exposing aquatic organisms to lethal or otherwise stressful concentrations of these metals. Prior to response actions having been undertaken at the Walker Mine by the Water Board, these organisms were either killed outright or their life cycles affected to such a degree that they could not maintain viable and productive populations. Approximately 3,800 feet of Dolly Creek above the confluence with Little Grizzly Creek and about seven miles of Little Grizzly Creek were affected.

In 1987, the Water Board installed a concrete seal in the mine tunnel to reduce acid mine drainage and heavy metals discharge from the mine to nearby waters. This seal has reduced significantly the contaminated flows to Dolly Creek and Little Grizzly Creek. Surface water monitoring data collected by the Water Board shows that the seal has reduced the discharge of copper from the Walker Mine to Dolly Creek by approximately 98% above the tailings area, and by roughly 85% at the compliance station (R-5) below the confluence of Dolly Creek and Little Grizzly Creek (Figure 2-3). Although the Water Board's response actions have significantly reduced contaminant releases from the Walker Mine as shown in Figure 2-3, residual releases of copper from the Walker Mine into Dolly Creek continue to occur.

The Site, which encompasses the 100-acre tailings area roughly three-quarters of a mile downstream of the Walker Mine, also affects the water quality of Dolly Creek near its mouth and Little Grizzly Creek below its confluence with Dolly Creek. The residual concentrations of copper in Dolly Creek below the Walker Mine increase as the creek flows over the tailings material. Dolly Creek flows northeast to southwest along the northern portion of the tailings, picking up contaminated leachate water from the tailings in the upper Dolly Creek channel, resulting in the release of heavy metals, sediment, and turbid water to Dolly Creek and Little Grizzly Creek.

In particular, the release of copper has resulted in the continued impairment of aquatic life in Dolly Creek and immediately downstream of the confluence of Dolly Creek and Little Grizzly Creek, and the exceedance of the Water Board's Waste Discharge Requirements (WDRs), which are discussed below. Aquatic life in Dolly Creek has remained heavily impacted, however, the impacted reach of Little Grizzly Creek appears to be limited to approximately one mile downstream of the confluence with Dolly Creek. Dilution and biological update have reduced contaminant concentrations to levels tolerable for the return of a viable, cold-water fishery within the seven-mile section of Little Grizzly Creek.

Efforts to address contaminant releases from the Walker Mine and the tailings area at the Site span several decades. In 1958, the Water Board adopted a resolution prescribing WDRs for the tailings, and named the owners of the Walker Mine and the Forest Service as the dischargers (Resolution 58-181). In 1986, the Water Board rescinded the 1958 resolution, and issued a new order naming the Forest Service as the sole discharger (Order No. 86-073). The Water Board updated the WDRs in 1991 (Order No. 91-017) and, again, in 2000 (Order No. 5-00-028). The most recent order established maximum receiving water quality criteria for the R-5 compliance station on Little Grizzly Creek, downstream of the Site and the confluence of Dolly Creek and Little Grizzly Creek.

From 1990 to 1992, the Forest Service performed a Site Investigation (SI) that included a site material characterization study. This SI was performed as part of a Remedial Investigation/ Feasibility Study (RI/FS). The SI had a twofold focus: 1) the release and transport of copper and sediment from the tailings; and 2) the development of alternatives for stabilizing and reclaiming the tailings area. Ground water monitoring wells were installed at this time. The Forest Service also conducted a Preliminary Assessment that examined potential health risks to NFS users and workers at the Site. Other contamination pathways such as ground water were studied and determined to be insignificant or non-existent.

The RI/FS was completed in 1991, one year prior to completion of the site material characterization study. In the RI/FS, the Forest Service developed several remedial alternatives, including the diversion and control of Dolly Creek around the tailings. These alternatives are discussed in the section, "Basis for the ROD Amendment." This process culminated in the selection of the original Selected Remedy in the 1994 Record of Decision based on information available at that time. As described below, the Forest Service has implemented several components of the Selected Remedy.

The Forest Service signed the Record of Decision for the Site on June 10, 1994, which presents the Selected Remedy chosen in accordance with CERCLA, and, to the extent practicable, the NCP. The 1994 Record of Decision documents Alternatives 2 and 4 in the 1994 Proposed Plan as the original Selected Remedy (1994 ROD, pp. 19-20). This original Selected Remedy is summarized in Table 2-1.

Table 2-1 SELECTED REMEDY (ALTERNATIVES 2 AND 4) 1994 RECORD OF DECISION		
Alternative/ 1994 Proposed Plan	**Description**	**Page (1994 ROD)**
2	[Dolly Creek] Channel Erosion Control and Development of a Wetland for Passive Water Treatment	11
4	Revegetation and Wind Erosion Control	12

The original Selected Remedy included the following response action:

- treat the tailings material on-site;
- reconstruct 1,500 feet of Dolly Creek channel to a stable geometry and revegetate its banks, including the larger gully banks;
- construct a 15-acre passive water treatment system (wetland) in the lower portion of Dolly Creek;
- construct wind barriers on 50 acres of the tailings surface;
- neutralize 10 acres of low pH material with crushed limestone prior to revegetation;
- revegetate 60 acres of tailings area with grasses, shrubs, and trees;
- close the Site to public access where needed to protect treatment features; and
- monitor for success and compliance with Applicable or Relevant and Appropriate Requirements (ARARs).

(1994 ROD (Declaration), pp. 1-2.)

The Forest Service has implemented several components of the original Selected Remedy. As provided for in the 1994 Record of Decision, the Forest Service has completed the following:

- reconstructed 1,300 feet of the upper Dolly Creek channel;
- constructed four acres of the passive wetland treatment system (aerobic wetland) in the lower portion of Dolly Creek;
- installed wind fences on 50 acres of the tailings surface;
- revegetated roughly 80 acres of the tailings area with trees and some grasses and shrubs;
- installed a gate on the access road, blocked other access routes, and posted no vehicles allowed warning signs;
- conducted air quality monitoring while workers were present at the Site;
- performed routine site maintenance activities; and
- monitored for success and compliance with ARARs.

As part of the response action, the Forest Service has collected, reviewed, and analyzed additional surface and ground water monitoring data since 1994.

C. Basis for the ROD Amendment

The Forest Service considered six alternatives in the remedial process that culminated in the selection of Alternative 2, in combination with Alternative 4, in the 1994 Record of Decision. Among the alternatives that were not selected, the Forest Service used Alternative 1 (No Action) in the original Proposed Plan as a baseline for comparison of the alternatives. Of the remaining alternatives, the Forest Service considered and rejected Alternatives 3 (Diversion of Dolly Creek Around the Tailings Area, Stabilization of Dolly Creek Below the Diversion and Passive Water Treatment) and 5 (Vegetated Soil Islands and Wind Erosion Control), and eliminated Alternatives 6, 7, and 8 (treatment alternatives) in the Proposed Plan from further consideration.

In regard to Alternative 3, *which is the subject of this ROD Amendment*, the Forest Service rejected Alternative 3 due to inconclusive data. In the original Proposed Plan, Alternative 3 provided for the diversion and control of Dolly Creek, which flows unabated across the Site. Specifically, the 1994 Record of Decision states:

> There is no evidence that there is (sic) any long-term advantages between Alternatives 2 and 3 *at this time. Monitoring water quality is expected to give the evidence needed to consider the installation of the diversion structures in Alternative 3.*

(1994 ROD, p. 15 (emphasis added).) As a result, the Forest Service concluded that there was insufficient data at the time the Record of Decision was signed in 1994 to determine whether the diversion and control of Dolly Creek was necessary to ensure the proper functioning of the passive water treatment system.

In comparing Alternatives 2 and 3 with respect to compliance with water quality standards, the 1994 Record of Decision notes:

> The implementation of Alternative 2 alone (no upstream diversion) is expected to meet water quality ARARs. The success of the treatments would be evaluated at five year intervals. If water quality improvements are occurring, no further actions would be taken except monitoring. *If water quality is not improving, or doesn't appear to be able to meet ARARs, further remedial actions would be considered, including the diversion of Dolly Creek around the tailings area (Alternative 3).*

(1994 ROD, p. 14 (emphasis added).)

In implementing the original Selected Remedy described in the preceding section, the Forest Service has been unable to verify water quality improvements. In 1994, the Forest Service constructed a four-acre anaerobic wetland in the lower portion of Dolly Creek as an integral part of a passive water treatment system, as provided for in the original Selected Remedy. The anaerobic wetland experienced a catastrophic failure during its first year of operation that changed it from an anaerobic wetland to an aerobic wetland only. This failure stemmed from high spring run-off conditions following higher-than-average snowfall during the 1994-95 winter, resulting in the anaerobic wetland being filled with sediment and ceasing to function properly as a passive water treatment system. As a result, meaningful data on treatment rates for heavy metals are not available.

The Forest Service has been able to collect, however, additional data on the water flow levels in Dolly Creek and ground water elevation levels in the tailings area since the 1994 Record of Decision. As part of its five-year review in 1999, the Forest Service analyzed water flow data. An analysis of these data shows that Dolly Creek is subject to greater than expected fluctuations in water flow levels on both annual and seasonal bases.

A comparison of high and low flows for Dolly Creek above the tailings area (R-1) during the period, 1986-1999, is presented in Figure 2-4. The high flows range from 0.31 cubic feet per second (cfs) in 1994 to 12.30 in 1996. The average high flow is 4.18 cfs for 1986-1999; however, the average high flow is 2.15 cfs for 1986-1994 while the average high flow is 7.83 cfs for 1995-1999. In contrast, the low flows range from 0.06 in 1988 to 0.93 in 1995. The average low flow is 0.42 cfs.

The hydrological data analyzed by the Forest Service can be found in the report entitled, "Analysis of Surface Water Quality at the Walker Mine Tailings, Forest Service, Plumas National Forest, Beckwourth Ranger District, 1986-1999" (Appendix 1). This report presents key Forest Service findings:

- Dolly Creek is subject to significant fluctuations in water flow levels;
- these fluctuations occur on both annual and seasonal bases; and
- high and low water flow levels are substantially different from those calculated or modeled at the time of the 1994 Record of Decision, as reflected in the RI/FS.

The import of these findings concerning fluctuations in the water flow levels in Dolly Creek is discussed below.

In addition, the Forest Service has observed increased erosion rates in the upper Dolly Creek channel and accelerated sedimentation under uncontrolled flow conditions since the 1994 Record of Decision. As explained above, in 1994, the Forest Service constructed a four-acre anaerobic wetland in the lower portion of Dolly Creek as an integral part of the passive water treatment system. This anaerobic wetland experienced a catastrophic failure during the first year

of operation that changed it from an anaerobic wetland to an aerobic wetland only. The failure stemmed from high spring run-off conditions following the higher-than-average snowfall during the 1994-95 winter, resulting in the wetland filling with sediment and ceasing to function properly as a passive water treatment system. The observed increased erosion rates and the accelerated sedimentation of the wetland can be found in the report entitled, "Analysis of Surface Water Quality at the Walker Mine Tailings, Forest Service, Plumas National Forest, Beckwourth Ranger District, 1986-1999" (Appendix 1, p. 7 (Critical Observations)). The importance of these observations is discussed below.

The Forest Service also has collected new ground water data since the 1994 Record of Decision. In the Forest Service's Annual Monitoring Report for 2000 prepared for the Water Board, the Forest Service analyzed ground water data from 1994 and 2000 for monitoring well W-3. The Annual Monitoring Report presents these data in Tables 5 and 6 of the report. A copy of this report can be found in Appendix 2. These data show seasonal fluctuations in ground water elevations in the monitoring well closest to the anaerobic wetland that was to be constructed as a component of the remedy selected in the 1994 Record of Decision. While the ground water data from 1994 may be suspect on technical grounds as explained in the Annual Monitoring Report, the data from 2000 suggests that the average depth to water may be as little as six feet (Appendix 2, Table 5). The significance of ground water elevations in the vicinity of the anaerobic wetland is discussed immediately below.

Based on the new information, the Forest Service has determined that fluctuations in water flow levels in Dolly Creek have the potential to impair the functioning and survival of the passive water treatment system called for in the original Selected Remedy. During high flow periods, the sheer volume of water carried by Dolly Creek may overwhelm the treatment capacity of the wetland by reducing or eliminating residence (*i.e.*, treatment) time. Contaminated water in Dolly Creek is likely to pass rapidly through (or even over) the passive water treatment system, and would have a reduced opportunity for treatment during high flow periods. Moreover, during high flow periods, the rise in water levels in Dolly Creek may cause additional erosion of the tailings material in the upper Dolly Creek channel, resulting in accelerated sedimentation of the wetland. Accelerated sedimentation reduces treatment effectiveness and life expectancy, thereby increasing maintenance costs and replacement frequency. In addition, during low flow periods, the available volume of water may not be adequate to maintain a relatively constant water elevation to sustain an anaerobic wetland (*i.e.*, an environment without oxygen).

BASIS FOR AMEND. NEED

In light of the new information, the Forest Service believes that the response action selected in this ROD Amendment is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Actual or threatened releases of hazardous substances, if not addressed by implementing the response action selected in the 1994 Record of Decision, as modified by this ROD Amendment, may present an imminent and substantial endangerment to public health, welfare, or the environment.

The following information in the Administrative Record supports the need for the ROD Amendment:

- Analysis of Surface Water Quality at the Walker Mine Tailings, Forest Service, Plumas National Forest, Beckwourth Ranger District, 1986-1999 (Appendix 1);
- Annual Monitoring Report [Walker Mine Tailings, calendar year 2000], Forest Service, Plumas National Forest, prepared for the Water Board (Appendix 2);
- USDA field notes, dated June 9, 1995; and
- Constructing Wetlands to Treat Acid Mine Drainage, Robert S. Hendin, Robert L.P. Kleinmann, and Greg Brodie, 1990 Course, p. 10 (Inflow and Surge/Constant Head Control ("The maintenance of a relatively constant head on the inflow to the wetland system will provide the wetland system with a relatively constant inflow rate and simplify design considerations. The wetland system will operate in a relatively constant, stead-state condition, which minimizes hydraulic, vegetative, and substrate stresses.").

D. Description of New Alternatives

1. Original Selected Remedy (1994 Record of Decision)

Based on the 1994 Proposed Plan, the original Selected Remedy provided for the following response action:

- treat the tailings material on-site (removal of all or part of the material was not proposed); reconstruct 1,500 feet of Dolly Creek channel to a stable geometry and revegetate its banks, including the larger gully banks;
- construct a 15-acre passive water treatment system (wetland) in the lower portion of Dolly Creek (including raising the sediment retention dam approximately two feet);
- construct wind barriers on 50 acres of the tailings surface;
- neutralize 10 acres of low pH material in the tailings area with crushed limestone prior to revegetation;
- revegetate 60 acres of the tailings area with grasses, shrubs, and trees;
- close the Site to public access where needed to protect treatment features; and
- monitor for success and compliance with ARARs.

(1994 ROD (Declaration), pp. 1-2.)

2. Alternative 1 (2000 Proposed Plan)

As generally described in the 2000 Proposed Plan (April 21, 2000), Alternative 1 would implement the original Selected Remedy as described immediately above without modification. Under Alternative 1, the remaining portions of three components of the originai Selected Remedy would be implemented as part of the Amended Selected Remedy. As provided for in the original

Selected Remedy, 1,500 feet of upper Dolly Creek channel would be reconstructed to a stable geometry and the creek banks would be revegetated. Also, in the 100-acre tailings area, 10 acres of low pH material would be neutralized with crushed limestone, and 60 acres would be revegetated with grasses, shrubs, and trees. Finally, the Site would be closed to public access when needed to protect treatment features.

3. Alternative 2 (2000 Proposed Plan)

Alternative 2 would modify the original Selected Remedy. This alternative provides for the diversion and control of Dolly Creek around the tailings, and monitoring the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards (ARARs). In specific, water flowing through the Dolly Creek channel above the confluence with Little Grizzly Creek would be diverted around the tailings through the construction of a diversion dam, a control gate, and a ditch or other means of diversion. The ditch would divert relatively clean water from upstream of the tailings around the tailings, thus reducing copper contamination to Dolly Creek from the tailings leachate water, which is the primary source of copper contamination at the Site. Copper leaches to Dolly Creek along its path across the tailings area. The diversion ditch would be designed to carry a 20-year flow (100 cubic cfs), allowing all flows greater than that to flow unabated through the existing Dolly Creek channel. Flows associated with the potential catastrophic failure of the seal installed in the tunnel at the Walker Mine in 1987 would not be contained in the diversion channel, but rather would flow over the tailings area and retention dam to Little Grizzly Creek.

A water monitoring program would be conducted to evaluate the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards. Under Alternative 2, if, at the end of an initial three-year water monitoring period, the diversion and control of Dolly Creek without a passive water treatment system achieves water quality standards, no further work would be done to construct an anaerobic wetland immediately downstream from the anaerobic wetland (now an aerobic wetland only) built in 1994. As part of an ongoing monitoring program, the necessity of the passive water treatment system would be re-evaluated every five years for the next 25 years after the initial three-year monitoring period.

Alternative 2 incorporates two *contingency* remedies in the event that the diversion and control of Dolly Creek is not effective in achieving water quality standards. The first contingency remedy provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as reflected in the original Selected Remedy. This contingency remedy involves the construction of the remaining anaerobic wetland portion of the passive water treatment system, and the operation of the diversion to enhance the effectiveness of the passive water treatment system in meeting water quality standards. As a passive water treatment system, the anaerobic wetland would treat water contaminated by the tailings (and residual heavy metals discharge from the Walker Mine) by reducing heavy metals, specifically, copper and zinc, before the contaminated water reaches Little Grizzly Creek.

The second contingency remedy provides for the diversion of Little Grizzly Creek to optimize the treatment capacity of the passive water treatment system, if the first contingency remedy is implemented. Proper operation of the Dolly Creek diversion is necessary to regulate the volume and timing of water entering the passive water treatment system. The water table that sustains the anaerobic wetland may drop to a level that threatens the proper operation and survival of the wetland during low flow periods. A lowered water table has the potential to affect the functioning and survival of the passive water treatment system because anaerobic wetlands require a constant supply of water to maintain an environment that is low in oxygen. The low-oxygen environment is essential to the biological processes that remove the heavy metals from solution, thereby inhibiting their migration. Consequently, the water elevation must be maintained above the ground surface. If the water table drops below the ground surface, Alternative 2 will divert water from Little Grizzly Creek, above the confluence with Dolly Creek, to the wetland. The Little Grizzly Creek diversion would operate only during low flow, and it would be limited to the volume of water needed to increase the water table elevation to maintain the anaerobic wetland.

As part of the water monitoring program, data would be collected to determine the effectiveness of the diversion and control of Dolly Creek in achieving water quality standards, namely, ARARs. These data also would be used to determine operating requirements for the diversion and to evaluate the effects of the diversion on the Site's ground water. As part of this water monitoring program, data would be collected at the downstream station on Dolly Creek (R-2) and at the compliance station (R-5) below the confluence of Dolly Creek and Little Grizzly Creek, with additional stations upstream of station R-2 at the Dolly Creek diversion outlet and the sediment retention dam overflow.

The 1994 Record of Decision describes the remedial action goals and objectives for the Site. Specifically, two goals are described: 1) the protection of the beneficial uses of Little Grizzly Creek from the release of contaminants to the environment from the tailings; and 2) the protection of the health of users and workers at the Site from exposure to tailings dust (1994 ROD, p. 10). Further, two objectives are described: 1) to reduce the release of contaminants from the tailings to Dolly Creek and Little Grizzly Creek by meeting the requirements for receiving water as stated in Water Board Resolution No. 68-16 (anti-degradation policy statement), or, if not feasible, the requirements of Water Board's WDRs for the U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County (Order No. 5-00-28) within five (5) years of completion of the remedial action (1994 ROD, p. 10).

Since the 1994 Record of Decision was signed, the Water Board has adopted revised WDRs for the U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County (Order No. 5-00-28). These WDRs replace Order No. 91-017 which was in effect when the 1994 Record of Decision was signed. Order No. 5-00-28 requires the Forest Service to meet the provisions contained in Division 7 of the California Water Code

and to comply with certain other requirements. The most significant changes in the WDRs involve modification of the numerical receiving water limitations for copper from 9.22 micrograms per liter (ug/l) under Order No. 91-017 to 5.0 ug/l under Order No. 5-00-28, and, to a less significant degree, for zinc from 65 ug/l to 66 ug/l. These changes are the result of updated limitations calculated by the Water Board using the four-day average equations from the U.S. EPA's nationally recommended water quality criteria. Information Sheet, Order No. 5-00-28.

Changes in expected outcomes as a result of the ROD Amendment vary according to the alternative. Under Alternative 1, water quality in Little Grizzly Creek below the confluence with Dolly Creek would not improve above existing levels, resulting in continued impairment of aquatic life downstream of the Site. Available uses of surface water for human consumption below the Site would be unrestricted.

In contrast, under Alternative 2, available uses of surface water below the Site would be unrestricted upon achieving cleanup levels. Alternative 2 is expected to improve water quality downstream of the Site at the R-5 compliance station to a level that meets water quality standards and enhances conditions necessary for aquatic life. This represents a significant enhancement in available uses of surface water from the original Selected Remedy. The only exception may be residual contamination from the Walker Mine that has the potential to affect Dolly Creek upstream of the tailings and Little Grizzly Creek below the confluence with Dolly Creek.

Under Alternative 2, water quality standards are expected to be met immediately after the completion of the Dolly Creek diversion. A water monitoring program will confirm if the Dolly Creek diversion is effective in meeting water quality standards. If the water quality standards cannot be met with the Dolly Creek diversion alone, Alternative 2 provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek as a contingency remedy. The anaerobic wetland is expected to take one to three years to become fully operational. A long-term monitoring program would be conducted to verify treatment success and maintenance needs.

Under Alternatives 1 and 2, water quality in Dolly Creek above the confluence with Little Grizzly Creek is not expected to improve except to the extent that contaminated water is treated under the first contingency remedy for Alternative 2. Under Alternative 2, the Dolly Creek diversion would reduce the loading of copper from the tailings to the creek by diverting the flow around the tailings area. In addition, residual heavy metals discharge from the Walker Mine would be limited from contaminating the Site further by diversion and control of Dolly Creek around the tailings. The Water Board is continuing to work with the owner of the Walker Mine to address the residual release or threat of release of hazardous substances from the mine itself.

In addition, under either Alternative 1 or 2, land uses would be limited due to the need to manage waste in the tailings area on a long-term basis. There are no changes in available uses of land under either alternative from the original Selected Remedy.

Both Alternatives 1 and 2 are expected to address potential hazards to human health by reducing fugitive dust at the Site.

E. Evaluation of Alternatives

Each of the alternatives is evaluated against the other using the nine criteria required under Section 121 of CERCLA and NCP § 300.430(f)(5)(i), 40 CFR § 300.430, paragraph (f)(5)(i). This evaluation is limited to the proposed diversion and control of Dolly Creek around the tailings, monitoring and evaluation of the effects of the diversion and control of Dolly Creek on the passive water treatment system; completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek as a contingency remedy; and the diversion of Little Grizzly Creek as a contingency remedy. Reference is made to the 1994 Record of Decision containing an evaluation of the other components of the response action that are common to both Alternative 1 and 2 in the Amended Record of Decision using the nine criteria.

1. Criterion #1: Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment, and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Alternative 1, which does not modify the original Selected Remedy, is not protective of human health and the environment by eliminating, reducing, or controlling risks posed by the Site through treatment, engineering controls, and/or institutional controls. This alternative does not address the protectiveness issues identified as a result of the new information since the 1994 Record of Decision. In particular, Alternative 1 fails to address potential impairment of the functioning and survival of the passive water treatment system called for in the original Selected Remedy. These issues include impairment in the functioning and survival of the passive water treatment system due to significant fluctuations in water flow levels in Dolly Creek during both high and low flow periods, and lowering of the ground water during low flow periods.

As explained in the section, "Basis for the ROD Amendment," during high flow periods, the sheer volume of water carried by Dolly Creek may overwhelm the treatment capacity of the wetland by reducing or eliminating residence time. Contaminated water in Dolly Creek is likely to pass rapidly through (or even over) the passive water treatment system, and would have a reduced opportunity for treatment during high flow periods. In addition, during high flow periods, the rise in water levels in Dolly Creek may cause additional erosion of the tailings material in the upper Dolly Creek channel, resulting in accelerated sedimentation of the wetland. Accelerated sedimentation reduces treatment effectiveness and life expectancy, thereby increasing maintenance costs and replacement frequency. Moreover, during low flow periods,

the available volume of water may not be adequate to maintain a relatively constant water elevation to sustain an anaerobic wetland (*i.e.*, an environment without oxygen).

Alternative 2 is protective of human health and the environment by eliminating, reducing, or controlling risks posed by the Site through engineering controls (diversion and control), treatment (passive water treatment system), if necessary, and institutional controls. Alternative 2 addresses the protectiveness issues identified as a result of the new information since the 1994 Record of Decision by diverting and controlling water flow levels in Dolly Creek.

As discussed in the 1994 Record of Decision, the inhalation of crystalline silica dust emanating from the tailings material may affect human health (1994 ROD, p. 7). The California Safe Drinking Water and Toxic Enforcement Act of 1986 identifies airborne particles of respirable size such as crystalline silica as known to cause cancer (Chemical Abstracts Services Registry, October 1, 1988). The State of California Environmental Protection Agency, Department of Toxic Substances Control, did not identify any specific air quality ARARs for the Site. However, the Forest Service already has taken steps to limit access to the Site, including installing a gate on the access road; blocking other access routes, and posting no vehicles allowed warning signs. Also, the continued revegetation of the tailings area called for in the original Selected Remedy will help to reduce fugitive dust. In addition, Plumas County Department of Environmental Health has indicated that the County will enforce exposure restrictions upon frequent users and workers at the Site by requiring restricted access and/or use of proper respiratory equipment.

2. Criterion #2: Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121(d) of CERCLA and NCP § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA § 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the

particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

The Forest Service has identified ARARs for the Site in consultation with the State, including the California Department of Justice, the Water Board, and other State and local agencies. None of the ARARS listed below are being waived.

Identified ARARs are listed in Table 2-2 on the following page.

Table 2-2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)	
ARAR	**Description**
Water Board Resolution 68-16 (Anti-Degradation Policy)	This resolution satisfies the Federal Clean Water Act's anti-degradation policy requirement. It requires the continued maintenance of high quality waters of the State even where that quality is better than needed to protect beneficial uses, unless specific findings are made. Water quality cannot be degraded below what is necessary to protect beneficial uses in any case.
Water Board Order No. 5-00-28 (Waste Discharge Requirements, U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County)	Order No. 5-00-28 supersedes Order No. 91-017, which was in effect when the 1994 Record of Decision was signed. The current Order requires the Forest Service to meet the provisions contained in Division 7 of the California Water Code and to comply with the following:
	Discharge Prohibitions —Discharges causing the degradation of any water supply are prohibited. —Discharges having a pH less than 6.5 or greater than 8.5 are prohibited.
	Discharge Specifications (for all waters leaving the Site) —Neither the treatment nor the discharge shall cause a pollution or nuisance as defined in Section 13050 of the California Water Code. —Storm water discharges to any surface or ground water shall not adversely impact human health or the environment. —Storm water discharges shall not cause or contribute to a violation of any applicable water quality standards contained in the Basin Plan.

Table 2-2
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

ARAR	Description
Water Board Order No. 5-00-28 (continued)	Receiving Water Limitations —The discharge(s) shall not cause concentrations in Grizzly Creek at R-5 (immediately above Road 25N42 and above the west side spring discharge) to exceed the following limits: Constituents — Units — Limitation* Copper — ug/l — 5.0 Iron — ug/l — 1000 Zinc — ug/l — 66 *The copper and zinc limitations are calculated using a hardness of 50 mg/l as CaCO3. —The discharge shall not cause: –Visible oil, grease, scum, foam, floating or suspended material in the receiving waters or watercourses. –Concentration of any materials in the receiving waters which are deleterious to human, animal, aquatic, or plant life. –Aesthetically undesirable discoloration of the receiving waters. –Bottom deposits in the receiving waters. –Fungus, slimes, or other objectionable growths in the receiving waters. –An increase in the turbidity of the receiving waters by more than 20% over background levels. –Alterations of the normal ambient pH of the receiving water more than 0.5 units. –Taste or odor producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or to cause nuisance or adversely affect beneficial uses. –Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded. –Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health. –Violations of any applicable water quality standard for receiving waters adopted by the [Water] Board or the State Water Resources Control Board.

Alternative 1, which implements the original Selected Remedy using a combination anaerobic and aerobic wetland as the primary water treatment system, is not expected to comply with ARARs because this alternative fails to address potential impairment of the functioning and survival of the system. The Forest Service has observed significant fluctuations in water flow levels in Dolly Creek above the confluence with Little Grizzly Creek as discussed above in the section, "Basis for the ROD Amendment." Uncontrolled flow conditions have the potential to impair functioning and survival of the passive water treatment system during both high and low flow periods in three respects.

First, as explained previously, during high flow periods, the sheer volume of water carried by Dolly Creek may overwhelm the treatment capacity of the wetland by reducing or eliminating residence time. Contaminated water in Dolly Creek is likely to pass rapidly through (or even over) the passive water treatment system, and would have a reduced opportunity for treatment during high flow periods. Second, during high flow periods, the rise in water levels in Dolly Creek may cause additional erosion of the tailings material in the upper Dolly Creek channel, resulting in accelerated sedimentation of the wetland. Accelerated sedimentation reduces treatment effectiveness and life expectancy, increasing maintenance costs and replacement frequency. Third, during low flow periods, the available volume of water may not be adequate to maintain a relatively constant water elevation to sustain an anaerobic wetland (*i.e.*, an environment without oxygen).

Alternative 2 is expected to meet ARARs. Alternative 2 will enhance surface and ground water conditions necessary for proper anaerobic wetland functioning and survival. The water monitoring program under Alternative 2 will confirm compliance with ARARs, including physical and chemical water quality requirements.

In the event that the diversion and control of Dolly Creek does not meet ARARs, Alternative 2 incorporates a contingency remedy that provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as reflected in the original Selected Remedy. This contingency remedy involves the construction of the remaining anaerobic wetland portion of the passive water treatment system, and the operation of the diversion to enhance the effectiveness of the system in meeting water quality standards. In addition, Alternative 2 incorporates a second contingency remedy that provides for the diversion of Little Grizzly Creek to optimize the treatment capacity of the system, if the first contingency remedy is implemented. Although partial construction of the passive water treatment system to date has not resulted in attainment of ARARs, it is expected that the passive water treatment system will attain ARARs when operated in conjunction with the diversion and control of Dolly Creek, as provided for in Alternative 2, by mitigating the effects of existing uncontrolled flow conditions on the system.

3. Criterion #3: Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. This criterion includes the consideration of residual risk that will remain on-site following remediation and the adequacy and reliability of controls.

Each alternative provides some degree of long-term protection. The alternatives increase in effectiveness of assuring protection against the discharge of heavy metals as additional treatment components are included. The effectiveness and permanence of Alternative 1 is dependent upon insulating the passive water treatment system from uncontrolled flow conditions in Dolly Creek. With the addition of the diversion and control of Dolly Creek in Alternative 2, this alternative provides a higher degree of long-term effectiveness and permanence in ensuring the proper functioning and survival of the passive water treatment system under controlled flow conditions and the concomitant removal of contaminants from the leachate water through passive treatment. This alternative would enhance surface and ground water conditions necessary for anaerobic wetland functioning and survival.

4. Criterion #4: Reduction of Toxicity, Mobility, or Volume through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternative 1 is not expected to reduce the toxicity, mobility, or volume of the contaminants of concern, namely, copper, iron and zinc, through treatment. Without the diversion and control of Dolly Creek, uncontrolled flow conditions during both high and low flow periods have the potential to impair functioning and survival of the passive water treatment system. In the absence of a functioning passive water treatment system, this alternative cannot be expected to reduce the toxicity, mobility, or volume of the contaminants of concern.

Alternative 2, in contrast, is expected to reduce the toxicity, mobility, or volume of the contaminants of concern through treatment. The diversion and control of Dolly Creek would reduce the loading of copper from the tailings to the creek by diverting the flow around the tailings area. The volume of contaminated water leaving the Site may be reduced significantly or eliminated because leachate water generated from the tailings is not expected to contaminate the re-routed Dolly Creek flow. Although the heavy metals in the tailings would not be "treated" as that term is used in the NCP, Alternative 2 is expected to reduce the release of contaminants from the Site to the environment by containing them on-site.

If the diversion and control of Dolly Creek does not meet ARARs alone, the first contingency remedy for Alternative 2 provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as reflected in the originai

Selected Remedy. Passive treatment involves the removal of heavy metals in contaminated water by a wetland system in which both aerobic and anaerobic environments function. Heavy metals present in the contaminated water would be removed from solution by a complex interaction with plants, organic matter, and bacteria as the contaminated water flows through the wetland system.

The diversion and control of Dolly Creek would reduce the toxicity, mobility, or volume of the contaminants through treatment by allowing the treatment method selected in the 1994 Record of Decision, namely, the passive water treatment system, to function effectively. This system would treat any residual flows from Dolly Creek above the confluence with Little Grizzly Creek, and it would treat residual contamination in the diverted Dolly Creek flows above the tailings area. With the diversion and control of Dolly Creek, passive treatment of heavy metals would be made feasible by regulating flow conditions that, if left uncontrolled, have the potential to impair the functioning and survival of the passive water treatment system. In addition, the Dolly Creek diversion would be designed to maximize the feasibility of the system by sealing the diversion ditch against leakage, increasing the volume of water released at the outlet. This increased volume of water would be released at the wetland, raising the elevation of the ground water at the location where it is most needed. It also would be released at a location that creates a backwater which will have the beneficial effect of extending the residence time of the leachate water in the wetland, maximizing treatment opportunities.

5. **Criterion #5: Short-Term Effectiveness**

Short-term effectiveness addresses the period of time needed to implement the remedy and adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Alternative 1 would be completed in approximately three years. During this period, the construction activities associated with building the passive water treatment system would take place. This alternative would mobilize sediment during the construction of the anaerobic wetland. Sediment basins or other controls would be used to capture work-generated sediments. The construction would occur during the summer months when the Dolly Creek flow is lowest, and, consequently, sediment from the construction activities is not expected to reach Little Grizzly Creek.

Alternative 2 would be completed in approximately three years, assuming that it is not necessary to implement the contingency remedies. During this time, construction activities associated with the diversion and control of Dolly Creek would include the clearing of trees and other vegetation to accommodate the ditch and its access road. This alternative also would mobilize sediment during construction. Sediment would be mobilized during the re-routing of Dolly Creek around construction activities. Sediment basins or other controls would be used to capture work-generated sediments. Construction would occur during the summer months when

the Dolly Creek flow is lowest, and, consequently, sediment from the construction activities is not expected to reach Little Grizzly Creek below the confluence with Dolly Creek.

Under both alternatives, health and safety risks to workers would be addressed and minimized. Workers would be required to wear appropriate levels of protection and air quality would be monitored to avoid exposure to the Site's fugitive dust that arises during windy conditions. No exposure to hazardous substances would occur for members of the public during these activities due to restricted access to the Site.

6. **Criterion #6: Implementability**

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Implementation of Alternative 1, which provides for the original Selected Remedy including construction of a 15-acre passive water treatment system, is relatively straightforward. All materials needed for implementation are readily and commercially available. The construction of a diversion dam, a control gate, and a ditch under Alternative 2 is easily implemented. Materials and equipment necessary for construction are readily available. The site logistics are constrained by limited access to the Site during the winter months, however, construction is expected to take place during the summer months. If it becomes necessary to implement the first contingency remedy under Alternative 2 involving completing the construction of a 15-acre passive water treatment system, such implementation is relatively straightforward. Similarly, if it becomes necessary to implement the second contingency remedy entailing the diversion of Little Grizzly Creek to optimize the treatment capacity of the passive water treatment system, such implementation also is relatively straightforward. In the latter instance, it would be necessary for the United States, through the Forest Service, to claim a water right under the Reservation Principle from the State, and an in-stream flow study would need to be conducted to determine the water needs of Little Grizzly Creek.

7. **Criterion #7: Cost**

The estimated present worth cost of the alternatives ranges from $2,142,384 for Alternative 1 to $3,062,083 for Alternative 2. Cost summaries for each of the alternatives can be found in Table 2- 3 (Summary Comparative Analysis of Alternatives).

8. **Criterion #8: State/Support Agency Acceptance**

The Water Board previously expressed its support for Alternative 1, which would implement the original Selected Remedy. However, based on a letter from the Supervising Engineer for the Water Board to the Forest Supervisor for the Plumas National Forest, Forest

Service dated May 11, 2000, the Water Board is currently on record in support of Alternative 2 (Appendix 5). No comments have been received from any other agency, department, or commission of the State of California.

The County of Plumas is not on record in support of or opposition to either of the alternatives. However, the County of Plumas Department of Environmental Health has indicated that the County will enforce exposure restrictions upon frequent users and workers at the Site by requiring restricted access and/or use of proper respiratory equipment (Appendix 6).

9. **Criterion #9: Community Acceptance**

The Forest Service did not receive any written responses to its 2000 Proposed Plan from community members. Mr. Jack Boise, a downstream landowner near Genessee, Plumas County, contacted the Forest Service by telephone, and indicated that he was supportive of Alternative 2 (Appendix 7).

Atlantic Richfield Company (ARCO), a potentially responsible party which is on record in support of the original Selected Remedy, opposed modification of the remedy at this time. ARCO requested that the Forest Service consider completing implementation of the remedy selected in the 1994 Record of Decision (Appendix 4).

Table 2-3 contains a summary of the comparative analysis of the nine criteria discussed immediately above.

Table 2-3
SUMMARY COMPARATIVE ANALYSIS OF ALTERNATIVES

Criteria	**Alternative 1** Original Selected Remedy	**Alternative 2** Diversion and Control of Dolly Creek & Contingency Remedies
#1: Overall Protectiveness	Not protective of human health and the environment; does not address new information since 1994 ROD	Protective of human health and the environment; addresses new information since 1994 ROD
#2: Compliance with ARARs		
Chemical-specific ARARs	Surface water is not expected to meet ARARs at R-5 compliance station	Surface water is expected to meet ARARs at R-5 compliance station
Location-specific ARARs	No location-specific ARARs	No location-specific ARARs
Action-specific ARARs	No action-specific ARARs	No action-specific ARARs
#3: Long-Term Effectiveness and Permanence		
Magnitude of Residual Risk		
◦Direct contact/soil ingestion	Not applicable; ARARs apply to aquatic life only	Not applicable; ARARs apply to aquatic life only
◦Ground water ingestion for current users	Not applicable; ARARs apply to aquatic life only	Not applicable; ARARs apply to aquatic life only
◦Ground water ingestion for potential future users	Not applicable; ARARs apply to aquatic life only	Not applicable; ARARs apply to aquatic life only
Adequacy and Reliability of Controls	Inadequate water treatment; partially reliable controls (technology)	Adequate water treatment; reliable controls (technology)
#4: Reduction of Toxicity, Mobility, or Volume Through Treatment		
Treatment Process Used	Passive water treatment system	Passive water treatment system
Amount Destroyed or Treated	Partial treatment	Complete treatment (*i.e.*, treatment expected to meet ARARs)

Criteria	Alternative 1 Original Selected Remedy	Alternative 2 Diversion and Control of Dolly Creek & Contingency Remedies
Reduction of Toxicity, Mobility, or Volume	Not expected to reduce toxicity, mobility, or volume in absence of diversion and control of Dolly Creek	Expected to reduce toxicity, mobility, or volume with diversion and control of Dolly Creek and, if necessary, additional passive water treatment system
Irreversible Treatment	None	None
Type and Quantity of Residuals After Treatment	Unknown quantity of heavy metals will continue to be contained in tailings	Unknown quantity of heavy metals will continue to be contained in tailings
#5: Short-Term Effectiveness		
Community Protection	Gated access road; no vehicles allowed signs posted	Gated access road; no vehicles allowed signs posted
Worker Protection	Workers to be required to wear appropriate levels of protection; air quality monitoring	Workers to be required to wear appropriate levels of protection; air quality monitoring
Environmental Impacts	Mobilization of sediments during construction activities	Mobilization of sediments during construction activities
Time Until Action is Complete	3 years	3 years (assuming no contingency remedies are necessary)
#6: Implementability		
Ability to Construct and Operate	Relatively straightforward implementation involving construction of wetland	Construction of diversion dam, control gate and ditch easily implemented
Ease of Doing More Action if Needed	Yes; road permits access to Site during non-winter months	Yes; road permits access to Site during non-winter months
Ability to Monitor Effectiveness	Monitoring stations in place	3-year water monitoring program will be performed at an additional compliance station(s)
Ability to Obtain Approvals and Coordinate with Other Agencies	Forest Service will work with County of Plumas to ensure worker health and safety during construction activities	Forest Service will work with County of Plumas to ensure worker health and safety during construction activities
Availability of Equipment, Specialists, and Materials	Materials and equipment necessary for implementation readily available	Materials and equipment necessary for implementation readily available
Availability of Technologies	Technologies readily available	Technologies readily available

Criteria	Alternative 1 Original Selected Remedy	Alternative 2 Diversion and Control of Dolly Creek & Contingency Remedies
#7: Cost		
Present Worth Cost	$2,142,384	$3,062,083
Capital Cost	$1,110,720	$1,875,414
Annual O&M Cost	$59,113	$67,292
Discount Rate	4%	4%
Number of Years Projected	30	30
#8: State Acceptance	No	Yes
#9: Community Acceptance	Yes	Yes, except for potentially responsible party

F. Support Agency Comments

In a letter from the Supervising Engineer, Water Board, to the Forest Supervisor, Plumas National Forest, Forest Service dated May 11, 2000, the State states, "[t]he Proposed Treatment Plan [2000] is in agreement with the Dolly Creek rehabilitation requirements of Order No. 5-00-028. We concur with the concepts described in the plan and look forward to its implementation and success" (Appendix 5).

G. Amended Selected Remedy

1. Summary of the Rationale for the Amended Selected Remedy

In developing remedial alternatives for the 1994 Proposed Plan, the Forest Service tacitly recognized that the excavation and off-site disposal of the 100-acre tailings was not a viable option. Based on available information, the lead agency selected a passive water treatment system in the 1994 Record of Decision. In selecting that remedial action, the Forest Service determined that the passive water treatment system would address the release or threat of release of hazardous substances at the Site. The Forest Service also noted that there was insufficient data at the time the Record of Decision was signed in 1994 to determine whether the diversion and control of Dolly Creek was necessary to ensure the proper functioning and survival of the passive water treatment system. The new information about the potential impairment of the functioning and survival of the passive water treatment system under uncontrolled flow conditions discussed in the section, "Basis for the ROD Amendment," has filled the data gap identified in 1994.

In light of the new information since 1994, the Forest Service has determined that the diversion and control of Dolly Creek is now required. This Amended Selected Remedy will reduce or eliminate the flow of water through the upper Dolly Creek channel where the water comes into contact with copper that leaches from the tailings. In the event that the diversion and control of Dolly Creek does not achieve cleanup levels (ARARs), the Amended Selected Remedy incorporates a contingency remedy that provides for completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as reflected in the original Selected Remedy. In addition, the Amended Selected Remedy incorporates a second contingency remedy that provides for the diversion of Little Grizzly Creek to optimize the treatment capacity of the passive water treatment system, if the first contingency remedy is implemented.

2. Description of the Amended Selected Remedy

Under the Amended Selected Remedy, the primary remedial action to address the release or threat of release of hazardous substances at the Site is the diversion of Dolly Creek from its present course to a diversion ditch. This diversion ditch would run generally along the north edge of the Site for a distance of approximately 3,500 feet, and the terminus of the diversion ditch would be an outlet located no more than 50 feet upstream of the tailings dam ending in a rock energy-dissipater. The excavated soil from building the diversion ditch would be used to construct a minimal width service road along most of the length of the ditch.

Although design specifications are subject to change during the Remedial Design, it is anticipated that the diversion structure would be constructed of concrete with wood flashboards, and it would be sealed and rock lined. The diversion ditch would have a flow capacity of up to 100 cfs. Discharges greater than 100 cfs would pass over the flashboards and into the existing Dolly Creek channel.

Flows from the diversion ditch would travel a short distance (not to exceed 50 feet) from the outlet before flowing over the tallings dam. Little or no contaminants are expected to be picked up in this confined area unless there are sufficient quantities of water flowing from the Site to the tailings dam. There are no known contamination sources below the tailings dam.

Off-site flows would continue to be monitored at the compliance station (R-5) below the confluence of Dolly Creek and Little Grizzly Creek. In addition, water samples from near the end of the diversion ditch would be taken at the same time. If, after monitoring at the compliance station shows that water quality standards are met, implementation of the contingency remedies for Alternative 2 would not be necessary. If, on the other hand, leachate water continues to be released from the Site resulting in water quality standards being exceeded at the compliance station, it would be necessary to complete the first Alternative 2 contingency remedy, and possibly the second contingency remedy.

The first contingency remedy involves completing the construction of a 15-acre passive water treatment system in the lower portion of Dolly Creek, as provided for in the original Selected Remedy. The second contingency remedy entails diverting water from Little Grizzly Creek upstream of the tailings if the wetland described immediately above requires additional water during the dry months of the year, or, more likely, during dry years. The diverted water would flow by gravity, or other appropriate means, to the anaerobic wetland. The Little Grizzly Creek diversion would be monitored to safeguard against harm to aquatic life.

Finally, the Amended Selected Remedy provides for additional components which were included in the original Selected Remedy. Namely, these components include neutralization of approximately 10 acres of low pH material in the tailings area with crushed limestone prior to revegetation; and fertilization and revegetation of roughly 60 acres of the tailings area with grasses, shrubs, and trees, including fertilization of tailings areas previously planted.

3. Summary of the Estimated Remedy Costs

Table 2-4 contains a cost estimate summary of capital costs for the Amended Selected Remedy including the two contingency remedies, and Table 2-5 below contains a cost estimate summary of annual operation and maintenance costs. Table 2-6 reflects a present worth analysis for the Amended Selected Remedy.

Table 2-4

PROJECT SCHEDULE AND CAPITAL COSTS

Project Description	First Year Implementation Cost	Second Year Implementation Cost	Third Year Implementation Cost	Fourth Year Implementation Cost	Total Project Cost
Construct Concrete Diversion Structure on Dolly Creek	$8,784				$8,784
Develop Rock Source	$13,200				$13,200
Construct, Seal & Rip-Rap Diversion Ditch for Dolly Creek	$361,612				$361,612
Reconstruct and Rock Sediment Dam Access Road		$15,600			$15,600
Realign 1000 ft of Dolly Creek and Stabilize Adjoining Bank	$9,000	$95,080	$78,880		$182,960
Treat 10 Acres with Crushed Limestone		$23,280			$23,280
Scatter 100 Trees on 10 Acres From Adjoining Slope	$2,400	$5,400			$7,800
Complete Tailings Area Vegetation Planting on 80 Acres	$32,400	$138,800	$108,800		$280,000
Construct Anaerobic Wetland and Raise Tailings Dam				$108,816	$108,816
Construct Little Grizzly Cr. Diversion Structure & Pipeline				$47,124	$47,124
Miscellaneous	$61,700	$61,700	$61,700		$185,100
Subtotal	$489,096	$339,860	$249,380	$155,940	$1,234,276
Project Management (15%)	$73,364	$50,979	$37,407	$23,391	$185,141
Remedial Design (20%)	$97,819	$67,972	$49,876	$31,188	$246,855
Construction Management (15%)	$73,364	$50,979	$37,407	$23,391	$185,141
Total Capital Cost	**$733,644**	**$509,790**	**$374,070**	**$233,910**	**$1,851,414**
Percent of Total	40%	28%	20%	13%	100%

Table 2-5			
ANNUAL OPERATION AND MAINTENANCE COSTS			
Description	**1-5 yrs**	**6-10 yrs**	**11-30 yrs**
Site Inspections	$1,350	$900	$900
Diversion and Ditch Repair	$6,750	$6,750	$6,750
Dolly Creek Maintenance	$6,750	$2,250	$0
Vegetation Maintenance	$30,000	$15,000	$3,000
Passive Water Treatment System (Anaerobic Wetland)	$5,088	$5,088	$840
Diversion of Little Grizzly Creek	$4,261	$4,261	$4,261
Vegetation Fertilization	$36,000	$36,000	$12,000
Water Monitoring Sampling	$3,150	$3,150	$3,150
Laboratory Analysis	$3,600	$3,600	$3,600
Water Quality Report	$1,200	$1,200	$1,200
Bioassessment Sampling	$3,000	$3,000	$3,000
Bioassessment Analysis	$900	$900	$900
Bioassessment Report	$600	$600	$600
Progress Report	$600	$600	$600
Five Year Reviews	$3,000	$3,000	$12,000
Total Annual O&M Cost	**$106,249**	**$86,299**	**$52,801**
Average Annual O&M Cost for 30 years is $67,292.			

Table 2-6

PRESENT WORTH ANALYSIS

Year	Capital Cost	Annual O&M Cost	Perodic Cost	Total Cost	Discount Factor (4%*)	Present Worth
0	$733,644	$0		$733,644	1.00	$733,644
1	$509,790	$106,249		$616,039	0.96	$591,397
2	$374,070	$106,249		$480,319	0.93	$446,697
3	$233,910	$106,249		$340,159	0.89	$302,742
4	$0	$106,249		$106,249	0.85	$90,312
5	$0	$106,249	$3,000	$109,249	0.82	$89,584
6	$0	$86,299		$86,299	0.79	$68,176
7	$0	$86,299		$86,299	0.76	$65,587
8	$0	$86,299		$86,299	0.73	$62,998
9	$0	$86,299		$86,299	0.70	$60,409
10	$0	$86,299	$3,000	$89,299	0.68	$60,723
11	$0	$52,801		$52,801	0.65	$34,321
12	$0	$52,801		$52,801	0.63	$33,265
13	$0	$52,801		$52,801	0.60	$31,681
14	$0	$52,801		$52,801	0.58	$30,625
15	$0	$52,801	$3,000	$55,801	0.56	$31,249
16	$0	$52,801		$52,801	0.53	$27,985
17	$0	$52,801		$52,801	0.51	$26,929
18	$0	$52,801		$52,801	0.49	$25,872
19	$0	$52,801		$52,801	0.47	$24,816
20	$0	$52,801	$3,000	$55,801	0.46	$25,668
21	$0	$52,801		$52,801	0.44	$23,232
22	$0	$52,801		$52,801	0.42	$22,176
23	$0	$52,801		$52,801	0.41	$21,648
24	$0	$52,801		$52,801	0.39	$20,592
25	$0	$52,801	$3,000	$55,801	0.37	$20,646
26	$0	$52,801		$52,801	0.36	$19,008
27	$0	$52,801		$52,801	0.35	$18,480
28	$0	$52,801		$52,801	0.33	$17,424
29	$0	$52,801		$52,801	0.32	$16,896
30	$0	$52,801	$3,000	$55,801	0.31	$17,298
Total	$1,851,414	$2,018,760	$18,000	$3,888,174		
Total Present Worth Cost						**$3,062,083**

* Forest Service Manual No. 1950.

The information in these cost estimate summary tables is based on the best available information regarding the scope of the remedial alternative. Changes in the cost elements are likely to occur as a result of new information and data collected during the engineering design of the remedial alternative. Changes may be documented in the form of a memorandum in the Administrative Record for a minor change, an Explanation of Significant Differences (ESD), or a ROD Amendment for a fundamental change. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to –30 of the actual project cost.

4. Expected Outcomes of the Amended Selected Remedy

Table 2-7 describes the expected outcomes of the Amended Selected Remedy.

Table 2-7
EXPECTED OUTCOMES OF THE AMENDED SELECTED REMEDY

	Site Area A Dolly Creek (above confluence): Restricted Use	**Site Area B Little Grizzly Creek (below confluence): Unrestricted Use**	**Site Area C (Tailings): Permanent Waste Management Area/ Restricted Use**
Site Scenario	Exposure controlled through use of engineering controls (diversion) and/or treatment (passive water treatment system), followed by institutional controls	No exposure control necessary	Exposure controlled through use of engineering and institutional controls ONLY
Expected Outcomes	Reduced Dolly Creek flow contact with heavy metals-contaminated tailings; improved water quality in upper Dolly Creek channel	Water quality standards for aquatic life expected to be met	Long-term waste management and site control

H. Statutory Determinations

Under CERCLA § 121 and the NCP, the Forest Service, as the lead agency, must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as a principal

element and a bias against off-site disposal of untreated wastes. The following sections discuss how the Amended Selected Remedy meets those statutory requirements.

1. Protection of Human Health and the Environment

The Amended Selected Remedy will protect human health and the environment by addressing the release or threat of release of hazardous substances at the Site through engineering controls (Dolly Creek diversion) and/or treatment (passive water treatment system), followed by institutional controls. In addition, the Amended Selected Remedy addresses the public health concern associated with crystalline silica dust insofar as the Forest Service already has taken steps to limit access to the Site. In addition, the Plumas County Department of Environmental Health has indicated that the County will enforce exposure restrictions upon frequent users and workers at the Site by requiring restricted access and/or use of proper respiratory equipment.

2. Compliance with ARARs

During the remedial process that culminated in the 1994 Record of Decision, the Forest Service identified ARARs for the Site in consultation with State and local authorities. At pages 8-10 of the 1994 Record of Decision, the following ARARs were identified:

Water Board Resolution 68-16 (Anti-degradation Policy); and

Water Board WDR for the U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County (Order No. 91-017) (rescinded on January 17, 2000, and new WDRs certified in Order No. 5-005-028).

The WDRs are intended to satisfy the provisions contained in Division 7 of the California Water Code and regulations. Discharges from the Site are regulated by Title 27 and/or Part 258 (27 CCR § 20005 *et seq.* and 40 CFR § 258 *et seq.*).

Surface water leaving the Site by way of Dolly Creek contains concentrations of copper and zinc that harm aquatic life by adversely affecting the water of Little Grizzly Creek below the confluence with Dolly Creek. Copper and zinc concentrations in Little Grizzly Creek downstream of the confluence range from near zero during spring high flow months to 0.06 milligrams per liter (mg/l) during summer low flow months (Appendix 1). These copper and zinc concentrations in Little Grizzly Creek limit biological activities downstream of the confluence. Copper and zinc are known to be toxic to aquatic life in low concentrations. Quality criteria for water, U.S. EPA (July 1976), pp. 54 and 245. Iron, when exposed to dissolved oxygen, forms soluble iron, which can deposit on stream substrate material or form flacculants, either of which may be detrimental.

The primary remedial action called for in this ROD Amendment, namely, the diversion and control of Dolly Creek, is expected to meet ARARs. This Amended Selected Remedy would reduce significantly the amount of contaminated material eroded from the Site and the transport of that material off-site. Metal loading to Dolly Creek would be reduced or eliminated because the flow in the upper Dolly Creek channel would be diverted around the heavy metals-laden tailings. If it is necessary to complete construction of the passive water treatment system to meet ARARs, metals potentially released from the Site by the surfacing of groundwater along the existing Dolly Creek channel would be treated passively in an anaerobic wetland, maintained by water from the Dolly Creek diversion, and, if necessary, by temporarily diverting some Grizzly Creek water to the wetland.

The Amended Selected Remedy complies with all ARARs. The ARARs are summarized below and described in more detail in Table 2-2 above. The chemical-specific ARARs include the following:

Water Board Resolution 68-16 (Anti-degradation Policy); and

Water Board WDR for the U.S. Department of Agriculture, Forest Service, Plumas National Forest, Walker Mine Tailings, Plumas County (Order No. 5-00-28).

Table 2-8 identifies the authority for each ARAR, describes the medium, provides the status of requirement, provides a brief synopsis of each requirement, and provides a brief description of the response action to be taken to attain the requirement.

Table 2-8
DESCRIPTION OF ARARs FOR AMENDED SELECTED REMEDY

Authority	Medium	Requirement	Status	Synopsis	Action to be Taken to Attain Requirement
State Regulatory Requirement	Groundwater	Anti-degradation policy (Water Board Resolution 68-16)	Relevant and Appropriate	This resolution satisfies the Federal Clean Water Act's anti-degradation policy requirement. It requires the continued maintenance of high quality waters of the State even where that quality is better than needed to protect beneficial uses, unless specific findings are made.	The Amended Selected Remedy will comply with the anti-degradation policy through engineering controls and passive treatment, if necessary, combined with institutional controls
State Regulatory Requirement	Surface water	Waste Discharge Requirements (Order No. 5-00-28)	Applicable	The current Order requires the Forest Service to meet the provisions contained in Division 7 of the California Water Code and to comply with the following: 1) discharge prohibitions; 2) discharge specifications; and 3) receiving. water limitations	The Amended Selected Remedy will comply with these requirements through engineering controls and passive treatment, if necessary, combined with institutional controls

3. Cost-Effectiveness

In the Forest Service's judgment, the Amended Selected Remedy is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition from the NCP was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" (NCP § 300.430(f)(1)(ii)(D)). This was accomplished by evaluating the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and the environment and were ARARs-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs and hence this alternative represents a reasonable value for the money to be spent.

The estimated present worth cost of the Amended Selected Remedy is $3,062,083. While Alternative 1 is approximately $920,000 less than Alternative 2, Alternative 1 does not satisfy the threshold criteria because this alternative is not ARARs-compliant. In light of the new information since the 1994 Record of Decision, the Forest Service does not believe that Alternative 1 addresses the potential impairment of the functioning and survival of the passive water treatment system under uncontrolled flow conditions in Dolly Creek. The Forest Service believes that the additional cost of diverting and controlling Dolly Creek in the Amended Selected Remedy provides a significant increase in the protection of human health and the environment, will be ARARs-compliant, and is cost-effective.

4. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

The Forest Service has determined that the Amended Selected Remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at this Site. In the lead agency's view, the Amended Selected Remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and bias against off-site treatment and disposal and considering State and community acceptance.

5. Preference for Treatment as a Principal Element

CERCLA creates a statutory preference for remedies that employ treatment as a principal element. In view of this statutory preference, the Forest Service selected a passive water treatment system in the 1994 Record of Decision. However, in light of the new information since 1994, namely, that Dolly Creek is subject to significant fluctuations in water flow levels on both annual and seasonal bases, the Forest Service has determined that the original Selected

Remedy will not comply with ARARs. In particular, the original Selected Remedy fails to address potential impairment of the functioning and survival of the passive water treatment system due to uncontrolled flow conditions. While water quality in the upper portion of Dolly Creek has improved dramatically with the installation of a seal in the mine tunnel at the Walker Mine, the relatively "clean," post-seal water continues to come into contact with the tailings along the lower Dolly Creek channel, leaching copper into the receiving waters. The Forest Service has determined that Dolly Creek is subject to significant fluctuations in water flow levels and that uncontrolled flow conditions exacerbate copper leaching as well as have an impact on treatment effectiveness. This new information is the impetus for this ROD Amendment.

The diversion and control of Dolly Creek satisfies the statutory preference for treatment for two key reasons. First, the diversion of Dolly Creek around the tailings will reduce or eliminate the need to treat water that is now contaminated as Dolly Creek flows unchecked across the heavy metals-contaminated tailings. Second, to the extent that residual contaminated water from the Site requires treatment through the implementation of the first and possibly second contingency remedies for Alternative 2, the Dolly Creek diversion will enhance treatment by maintaining adequate water elevation to ensure survival of the anaerobic wetland, increasing the residence time of the leachate water in the wetland, and extending the life of the wetland system by limiting sedimentation.

6. Five-Year Review Requirements

A statutory review will be conducted within five years after the initiation of remedial action to ensure that the Amended Selected Remedy is, or will be, protective of human health and the environment because the Amended Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure.

I. Public Participation Compliance

As provided for in NCP § 300.435(c)(2), the Forest Service has encouraged public participation in the selection of a remedy for the Site. The public was invited to participate in the development of the first Proposed Treatment Plan that culminated in the selection of a remedy in the 1994 Record of Decision, and the public again was invited to participate in the development of the second Proposed Treatment Plan for this ROD Amendment. The public, including individual members and community groups, local, State and Federal agencies, recognized Indian tribes, and potentially responsible parties were invited to participate. Communications included direct mailings, newspaper notices, and radio news releases. Two public meetings were held in 1993 for the first Proposed Treatment Plan.

Section III: RESPONSIVENESS SUMMARY

The Forest Service received limited comments regarding the 1999 Proposed Plan and the lead agency's preferred alternative. As explained in Section II.E.8 of the Decision Summary, the Water Board and the County of Plumas Department of Environmental Health generally have been supportive of the remedial change (Appendices 5 and 6, respectively). Also, as explained in Section II.E.9, there was limited comment by community members, and no express opposition to the preferred alternative.

The only significant public comment was in the form of comments from ARCO, a potentially responsible party that has been notified by the Forest Service that the party may have CERCLA liability in connection with the release or threat of release of a hazardous substance(s) at or from the Site. In its June 30, 2000 comments, ARCO opposed modification of the remedy at this time. ARCO requested that the Forest Service consider completing implementation of the remedy selected in the 1994 Record of Decision. ARCO's comments can be found in Appendix 3. The Forest Service is already on record as having responded to ARCO's comments in a letter dated January 22, 2001. The lead agency's response can be found in Appendix 5.

The comments and the Forest Service's response to ARCO's comments are incorporated by reference.

FIGURES

PICTURES

TOD Annenberg
Malheur Mine Tailings, Ochoco National Forest

Figure 2-1
(Map depicting the location of the Walker Mine Tailings)