

**DRAFT FINAL
OSBORNE HILL AREA TRAILS DATA EVALUATION AND
REMEDIAL OPTIONS ANALYSIS REPORT**

EMPIRE MINE STATE HISTORIC PARK



OCTOBER 2008

I certify under penalty of law that I have examined and am familiar with this report, and to my knowledge, the report is true, complete, and accurate.



Daniel P. Millsap, Professional Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND AND PURPOSE 2

3.0 OSBORNE HILL AREA TRAILS SURFACE METAL CONCENTRATION EVALUATION 4

 3.1 Trail Surface Soil Metals of Interest 4

 3.2 Summary of Arsenic Concentration for Trail Segments 6

4.0 ANALYSIS OF REMEDIAL OPTIONS 7

 4.1 Remedial Objective 7

 4.2 Identification of Remedial Options 7

 4.2.1 No Action 8

 4.2.2 Surface Cover 8

 4.2.3 Removal and Replacement 9

 4.2.4 Realignment 9

 4.2.5 Closure 9

 4.3 Natural and Cultural Resource Considerations 9

 4.4 Analysis Criteria 10

 4.5 Analysis of Specific Remedial Options 10

5.0 PREFERRED OPTIONS 12

6.0 OTHER 13

7.0 REFERENCES 14

TABLES

Table 1. Summary of Arsenic (As) Concentration (mg/Kg) in Trail Segments*

Table 2. Analysis of Remedial Options for each Trail Segment

Table 3. Preferred Options for Each Trail/Road System for Removal and Associated Work

Table 4. Preferred Options for Each Trail/Road System and Associated Work

FIGURES

Figure 1 Existing Trail Network with User Created Trails

Figure 2 Proposed Trail Network

Figure 3 2006-2008 Laboratory Correlated XRF Arsenic Concentrations Osborne Hill Area Trails

ATTACHMENTS

Attachment A DPR Osborne Hill Proposed Trail Network

Attachment B Data Transmittal Addendum for the Trails 2007 Action Work Plan

1.0 INTRODUCTION

The *Final, Osborne Hill Area Trails Data Evaluation and Remedial Options Analysis Report, Empire Mine State Historic Park* (Report) was originally prepared by MFG, Inc. (MFG), on behalf of Newmont USA Limited (Newmont) and submitted to the Department of Toxic Substances Control (DTSC) on July 14, 2008. Golder Associates has revised the document for the California Department of Parks and Recreation (DPR) and Newmont to incorporate revisions requested by the DTSC in a letter dated September 16, 2008, *Comments on the Draft Trails MND, Empire Mine State Historic Park, 10556 East Empire Street, Grass Valley, California 95945* (DTSC, 2008).

The Report included, as Attachment A, the *Osborne Hill Proposed Trail Network*, which was prepared by DPR in June 2008. This document has also been revised to address comments in DTSC's September 16, 2008 letter.

Revisions to the two documents referenced above are intended to make the Trails Remedial Options Analysis consistent with the Draft Initial Study, Mitigated Negative Declaration (IS/MND).

2.0 BACKGROUND AND PURPOSE

This Data Evaluation and Remedial Options Analysis Report is submitted pursuant to the Trails 2007 Action Work Plan for Empire Mine State Historic Park (MFG, 2007b), implemented under Amendment #1 to the 2006 Consent Order between the DTSC, the Central Valley Regional Water Quality Control Board (Regional Board), DPR, and Newmont. The Empire Mine State Historic Park (Park) is owned by DPR. The DTSC has identified certain trails within the Park as having a potential exposure pathway to DPR staff and the public due to the presence of mine and mill related materials on some of the trail surfaces.

In summer of 2006, MFG, on behalf of Newmont, conducted an investigation to determine metal concentrations of the trail soils along the entire trail network designated and authorized for public use within the Park. Soils metal (CAM-17) concentrations were determined by in-situ field X-ray fluorescence (XRF) measurements performed directly on the trail surface, and by laboratory analysis of soil samples collected from the trails. A total of 404 in-situ XRF measurements were performed and 81 soil surface samples were collected and analyzed by the laboratory. A conservative screening level analysis, using California Human Health Screening Levels (CHHSLs; Cal/EPA, 2005), of the trail surface soil metal concentrations indicated arsenic to be the primary metal that exceeded the residential CHHSL value (MFG, 2006). Elevated arsenic concentrations are the best indicator of potential mine and mill materials on the trail surfaces (MFG, 2006).

In 2006, the DTSC, Human and Ecological Risk Division (HERD) recommended a remediation goal for arsenic on the trail surfaces of 270 mg/Kg (Klein, 2006). Some of the trail segments in the Osborne Hill Area of the Park have arsenic concentrations along trail surfaces above the 270 mg/Kg goal. Interim actions were taken in late 2006/early 2007 to manage these trail surfaces until additional evaluations could be completed (MFG, 2006). These interim actions were comprised of covering or closing some trail sections, with supporting informational materials being provided to DPR staff and visitors. These interim actions were consistent with those detailed in the Data Transmittal and Addendum for the Trails 2006 Priority Work Plan (MFG, 2006). The trail segments with arsenic concentrations greater than 270 mg/Kg to be left open were covered with a three to six-inch thick layer of clean imported minus ¾-inch road base. Trail segments designated for interim closure were fenced to prevent access. Signage and supplementary educational materials were also provided to explain why these trail segments were temporarily closed.

In 2007, additional characterization activities were completed by DPR and MFG to collect further information on the Osborne Hill Area trail network. This work included:

- A survey of the trails to evaluate the condition of these trails with respect to DPR trail design guidelines and determine future use of the trail or trail segment; and
- Characterize metal concentrations along proposed new trail alignments and further assess the potential presence of mine and mill materials based on metal concentrations.

The trails survey was conducted by DPR staff with respect to DPR trail design guidelines for grade, drainage, and trail use, and resulted in a new proposed trail plan for the Osborne Hill Area. This proposed plan includes closure of certain trails that do not meet DPR trails guidelines; upgrade or reconstruction of existing trails to achieve management guidelines; and construction of new trails. During 2007, MFG characterized the metals concentrations of the surface soils for DPR's proposed new trail routes. These data were reported in the *Data Transmittal Report for the Trails 2007 Action Work Plan* (MFG 2008).

After the DPR trails survey was conducted and the proposed new trail plan developed, DPR presented the new trail system to the public in a public meeting. As a result of public comments, an additional new trail, the McKnight Way Trail, was added to the list of proposed new trails. The existing trail network with user created trails is shown on Figure 1 and the proposed trail network is shown on Figure 2. Both figures are presented in the Draft Final, *Osborne Hill Proposed Trail Network* (DPR, 2008), included as Attachment A. In March 2008, MFG performed sampling to determine the metal concentrations of surface soils for the McKnight Way Trail. These data are presented in Attachment B. The proposed Osborne Hill Area trail network resulting from the trails survey, with the addition of the McKnight Way Trail, is shown on Figure 2.

Section 3 of this report provides an evaluation, by MFG, of the metals concentrations in surface soils of the trail network for the Osborne Hill Area proposed by DPR, and Section 4 identifies the proposed remedial options developed to address the presence of mine and mill materials along some of the trail segments.

3.0 OSBORNE HILL AREA TRAILS SURFACE METAL CONCENTRATION EVALUATION

In 2006 and 2007, MFG completed field investigations to assess the soil metal concentrations of the Osborne Hill Area proposed trail network utilizing XRF field analyses and laboratory analyses, with the McKnight Way Trail added in early 2008. These data provide the basis for further evaluation of the trail surfaces in the Osborne Hill Area for the potential presence of mine and mill materials.

The results of MFG's 2006 investigation to define surface soil metal concentrations for existing trails are reported in the *Data Transmittal and Addendum for the Trails 2006 Priority Action Work Plan* (MFG, 2006). In-situ XRF measurements were performed at 200-foot intervals along the centerline of the existing trails, as defined by the 2006 work plan. A total of 404 in-situ XRF measurements were taken on surfaces of the trails throughout the Park and 103 of these measurements were located in the Osborne Hill Area. Of these 103 measurements, 19 soil samples were collected, sieved, and the less than 60 mesh fraction was submitted for laboratory analysis of CAM-17 total metals. Forty-six of the in-situ measurements and 10 of the laboratory samples were taken on trail segments that DPR is proposing to close, and are therefore not included in the evaluations below.

The results of the 2007 investigation to characterize metal concentrations for the new trail routes proposed in the DPR Osborne Hill Proposed Trail Network are reported in the *Data Transmittal for the Trails 2007 Action Work Plan* (MFG, 2008). In 2007, in-situ XRF measurements were performed at 50-foot intervals along the proposed trail delineation, as defined by the 2007 work plan. A total of 200 in-situ XRF measurements were taken, and 42 samples were collected, sieved, and the less than 60 mesh fraction was submitted for laboratory analysis of CAM-17 total metals.

The results from the 2008 investigation to characterize metal concentrations for the recently proposed McKnight Way Trail are included as Attachment B. Surface soil samples were collected for XRF measurements at 50-foot intervals along the proposed McKnight Way Trail alignment. A total of 52 samples were collected for XRF analysis, and 12 of these soil samples were sieved, and the less than 60 mesh fraction was submitted for laboratory analysis of CAM-17 metals.

3.1 Trail Surface Soil Metals of Interest

The results from the various metal evaluations for the proposed Osborne Hill trail network (not including results for trails proposed to be closed) were compared to the CHHSLs for residential use as a conservative screening level assessment to identify potential constituents of interest to human health. The residential CHHSLs are not applicable to trail use, since the potential human health exposure to soils from trail use is significantly less than that for residential use. If soil metal concentrations on the trail surfaces

are less than the residential CHHSLs, then they are conservatively below thresholds for risks to human health from trail use. Antimony, barium, beryllium, chromium, cobalt, copper, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc concentrations determined during the trail investigations did not exceed the residential CHHSLs. These elements are therefore not considered constituents of interest.

Cadmium exceeded the residential CHHSL of 1.7 mg/Kg at only one location on the McKnight Way Trail (MK12+50), with a concentration of 1.99 mg/Kg. The average cadmium concentration for the McKnight Way Trail is 0.914 mg/Kg, which is well below the residential CHHSL. Therefore, cadmium is not considered a constituent of interest.

Lead exceeded the residential CHHSL of 150 mg/Kg at only three of the 355 measurement locations. Two of these occurred on the McKnight Way Trail (out of a total of 52 measurements for the trail); with correlated XRF lead concentrations of 385 mg/Kg and 182 mg/Kg, respectively. The average correlated XRF lead concentration on the McKnight Way Trail is 68 mg/Kg, which is well below the residential CHHSL. The third location where lead exceeded the residential CHHSL was for the Prescott Hill Crosscut trail (PHC10+00) with a correlated XRF lead concentration of 239 mg/Kg. The average correlated XRF lead concentration for this segment is 96 mg/Kg. Given the conservatism in using the residential CHHSL for trail use, and since lead values exceeding the residential CHHSL occurred at only three single locations and the average lead concentration for these trail segments is low, lead is not considered a constituent of interest.

Arsenic is the only constituent of interest for trail surfaces in the Osborne Hill Area when compared with the residential CHHSLs. High arsenic concentrations also provide the best indicator of potential mine and mill material on the trail surfaces (MFG, 2006). The arsenic data from the 2006-2007 trails surveys were evaluated statistically using methods described by Rose, *et al.*, 1979, to determine if distinct populations of arsenic concentrations occur on the Osborne Hill trail network. This method uses a frequency histogram of the log of the analyte concentration and visually discriminating distinct population values, which would appear as additional peaks in the histogram. This statistical evaluation determined that arsenic concentrations of 200 mg/Kg and above indicate a distinct data population. Therefore, arsenic concentrations greater than 200 mg/Kg are used to identify areas where mine and mill material may exist on trail surfaces and may pose a potential exposure pathway to DPR staff and visitors. In addition, arsenic concentrations greater than 200 mg/Kg are generally indicative of historic mine and mill locations. This value is less than the DTSC remediation goal of 270 mg/Kg and adds even more conservatism to the analysis. The arsenic concentrations of the soil surface for the proposed trail network

in the Osborne Hill Area are shown in Figure 3. Note that the trail segment designations (i.e. A-B-C) listed in Tables 1 and 2 and shown on Figure 3 were developed for the soil arsenic sampling programs completed by MFG in 2006 and 2007. Some trail junction designations or individual segments on the DPR generated Tables 3 and 4 and Figures 1 and 2 may differ slightly as trail junction designations were adjusted based on environmental considerations.

3.2 Summary of Arsenic Concentration for Trail Segments

As shown on Figure 3, each trail is subdivided into individual segments where there is a junction with another trail or junction between an existing trail and a proposed new trail segment. Table 1 summarizes the arsenic concentrations for each trail segment as identified on Figure 3.

Locations with arsenic levels greater than 200 mg/Kg are highlighted in yellow on Figure 3. Certain segments of trails within the proposed Osborne Hill trail network have continuous portions with high arsenic concentrations. Most of these are near historic mine and mill features, including the Betsy Mine Waste Rock Pile, Pleides Shaft, Conlan Mine Waste Rock Pile, Daisy Hill Waste Rock Pile, Old Incline Shaft, Sebastopol Shaft and Waste Rock Pile, and the Prescott Hill Shaft and Waste Rock Pile. In addition, other trail segments have locations with high arsenic levels, as highlighted in yellow on Figure 2. There are two isolated sample locations with high arsenic: 1) on the Osborne Hill Loop Trail (segment G-N, arsenic concentration of 344 mg/Kg); and 2) on the Prescott Mine Loop Trail (segment J-T, arsenic concentration of 239 mg/Kg). Trail segments having a surface arsenic concentration greater than 200 mg/Kg are segments where mine and mill material may exist on trail surfaces and may pose a potential exposure pathway to DPR staff and visitors. Therefore, remedial options are evaluated for these trail segments.

4.0 ANALYSIS OF REMEDIAL OPTIONS

An analysis of remedial options was performed to address potential exposure pathways from mine and mill materials on trail surfaces (roads/trails) within the proposed Osborne Hill Area trail network. The DPR proposed trail plan (Attachment A) defines specific trail alignments, new construction, reconstruction, and closure of existing trail segments. Remedial options were not considered for those trail segments that are designated to be closed by DPR, as that activity would eliminate the potential exposure pathway to DPR staff and visitors from trail use. Each remedial option was analyzed for the individual trail segments identified in the arsenic soil characterization studies (Table 1).

4.1 Remedial Objective

The conceptual site model (CSM) presented in the Data Gaps report (MFG, 2007a) identifies potential release mechanisms, transport pathways, and exposure routes to receptors. Application of the CSM to the trails indicates that metals from mine and mill materials in the trail surfaces may be potentially released and transported by wind and water erosion or dust from:

- DPR staff and visitor use.
- Water erosion where sloped portions of the trails concentrate runoff during periods of high rainfall and snowmelt, resulting in deposition of mine and mill materials in downgradient areas.

These potential transport pathways lead to potential exposure routes of dermal contact, inhalation of dust and incidental ingestion for DPR staff and visitors. The objective of the remedial option(s) for the proposed Osborne Hill Area trail network is elimination of these potential release mechanisms, transport pathways, and exposure routes to receptors.

4.2 Identification of Remedial Options

The range of remedial options applicable to the DPR proposed Osborne Hill Area trail plan was described in the 2007 Trails Work Plan (MFG, 2007b). A common element of all of these remedial options is institutional controls on trails adjacent to mine and mill features, such as waste rock piles, shafts, tunnels, and mills to limit visitor access to these historic features along trail routes. Institutional controls include fencing, signage, and educational materials. The remedial options presented in this Report were identified prior to the MND evaluation. Under CEQA, a negative declaration, including a MND, defines treatment approaches that may be implemented as Work Actions for the trails remediation. DPR reviewed the five remedial options described in the Trails Work Plan and developed the work actions presented in the IS/MND. The five remedial options are listed in the Remedial Options/Work Actions

matrix below along with the Work Actions that incorporate the Remedial Options. The No Action Option is not analyzed in the IS/MND because the options have been incorporated as Work Actions in the IS/MND.

Remedial Options/Work Actions

Option/ Actions	2007 Trails Work Plan ¹ Remedial Options	2008 Draft IS/MND ² Work Actions
1.	No Action	Not Applicable
2.	Covering Trail Surfaces	Reconstruct Existing Trails, Construct New Trails
3.	Removal and Replacement of Surface Soil	Reconstruct Existing Trails, Construct New Trails, Closure
4.	Realignment of Trail Segments Away From Mine And Mill Materials	Reconstruct Existing Trails, Construct New Trails,
5.	Closure	Closure

Notes:

¹ 2007 Trails Work Plan (MFG, 2007b).

² Draft Initial Study/Mitigated Negative Declaration (DPR, 2008)

The five remedial options are discussed below:

4.2.1 No Action

The No Action option would be implementation of the DPR plan on a trail segment without addressing potential exposure routes. This alternative would achieve the remedial objective for only those trail segments where high arsenic concentrations associated with the presence of mine and mill materials are not present.

4.2.2 Surface Cover

This remedial option would involve covering trail segments with a 3 to 6-inch thick layer of compacted cover material (road base, gravel or other appropriate materials). The cover material would be clean imported fill material consistent with the DTSC Clean Fill Advisory (DTSC, 2001). Covering the surface of trail segments associated with mine and mill materials would eliminate the release mechanism, transport pathways, and exposure routes by isolating the materials. Covering will require long-term maintenance of the surface to ensure the cover remains intact.

4.2.3 Removal and Replacement

This remedial option would require removal of surface materials from trail surfaces to a depth of 6 to 12 inches and replacement with an appropriate new trail surface material. The cover material would consist of clean imported fill material consistent with the DTSC Clean Fill Advisory (DTSC, 2001). Removal and replacement of the trail surface on segments associated with mine and mill materials would meet the remedial objective by isolating the materials. This option would require long-term maintenance of the replacement soil and proper disposal of the excavated material. This remediation option is most appropriate where soil must be removed for the trail to meet trail design guidelines, but where side-casting (pushing cut material to the side of trail) is inappropriate because sensitive natural and cultural resources are located in these areas.

4.2.4 Realignment

Realignment involves diverting a trail segment around areas associated with mine and mill materials. The adjusted trail segment would require an evaluation to determine the metal concentrations along the new surface to ensure that the action would meet the remedial objective. This remedial option is not the same as minor trail adjustments to avoid features (sensitive natural and cultural resources) during construction; rather it is the re-location of an existing or proposed segment. Realignment may not be feasible due to topography and/or cultural or natural resources in the area surrounding the existing or proposed trail.

4.2.5 Closure

Closure or not constructing a new trail would meet the remedial objective by eliminating the release pathways and exposure routes. Closure would require decommissioning and reclaiming trail segments in the proposed trail network. This remedial option would not meet the DPR proposed trail plan.

4.3 Natural and Cultural Resource Considerations

DPR is evaluating the potential environmental effects of the proposed Osborne Hill Trail Network Project in an IS/MND in accordance with the California Environmental Quality Act (CEQA) (DPR, 2008). The proposed project would renovate the trail system at Osborne Hill to minimize erosion and sedimentation of soil and remediate areas where metals exceeded safety levels for human health (i.e., elevated metals) on road/trail surfaces. Additionally, the project would replace and install new accessory trail equipment such as public entry gates, signs, and fences, move one point of public access, remove existing fences in areas previously closed due to elevated metals for trails that are re-constructed, and close mine shafts.

DPR is currently conducting an assessment of natural resources within the proposed Osborne Hill Area trail network. To the extent that special status species have been identified, they have been taken into consideration as part of the analysis of remedial options.

In addition, DPR have completed an inventory of cultural resources within the proposed Osborne Hill Area trail network. Located within the area are prominent historic mining sites, including shafts, waste rock piles, and foundation remnants. To the extent currently identified, the cultural resources in the proposed Osborne Hill Area trail network were taken into consideration as part of the analysis of remedial options by inclusion in the evaluation criteria listed below. DPR is currently incorporating the results of the cultural resources inventory in a technical document.

4.4 Analysis Criteria

Remedial options are analyzed based upon effectiveness in meeting the remedial objective, implementability, cost, and ability to meet the DPR proposed trail plan. Effectiveness in meeting the remedial objective is determined by the ability of the action to eliminate potential release mechanisms, transport pathways, and exposure routes to receptors where arsenic concentrations exceed 200 mg/Kg. Implementability is based on the ability to meet the DPR trail design criteria for grade, drainage, and trail use; and whether cultural or biological resources would be adversely affected. Cost is determined qualitatively by comparing each remedial option. Ability to meet the DPR plan is determined by comparing the remedial options with the DPR trail network.

4.5 Analysis of Specific Remedial Options

The remedial options are analyzed by comparing each remedial option for each trail segment in the DPR proposed plan to the analysis criteria. The remedial option(s) that meets all criteria is the preferred option. The analysis of individual trail segments, identified during the arsenic soil characterization studies, is listed in Table 2, where the preferred option for each segment is shaded. Bold items indicate where remedial options do not meet analysis criteria.

This analysis leads to the following conclusions:

- No Action is only appropriate where arsenic concentrations are less than 200 mg/Kg along trail surfaces;
- Reconstruction and new construction activities in segments (or portions of segments) where surface arsenic concentrations are high should be:
 - Covered with a minimum of 3 to 6 inches of cover material that meets the DTSC Clean Fill Advisory; or

- Relocated to a new route that trail surface arsenic concentrations are less than 200 mg/Kg. If this remedial option is implemented, post-construction characterization is needed as described below.
- Reconstruction and new construction activities in segments where surface mine or mill material is not indicated, but the construction activities have the potential to expose such materials along the new trail surface. All reconstructed and newly constructed trails in these areas should be re-characterized after construction (i.e. post- construction characterization). If soils with arsenic concentrations exceeding 200 mg/Kg are exposed, these areas should be covered as described above.

5.0 PREFERRED OPTIONS

As identified in Section 4.0, remedial options are evaluated for specific trail segments of the proposed Osborne Hill Area trail plan. Remedial options were evaluated with respect to effectiveness in achieving the remedial objective, implementability, cost, and the DPR proposed use criteria. The analysis is summarized in Table 2. No Action is appropriate for trail segments where arsenic concentrations of the trail surface are less than 200 mg/Kg. For trail segments where arsenic concentrations of the trail surface are greater than 200 mg/Kg due to the presence of mine or mill materials, covering of the trail surface is the preferred option for eliminating potential exposures to DPR staff and the public from use of the trails, and eliminating water erosion of mine or mill materials on the trail surfaces. Fencing and interpretative signage would be provided along the trail edge for segments adjacent to mine waste rock dumps and mine shafts to limit visitor access to these historic features. For construction of new and existing trail segments in areas where special status species, large trees, or other sensitive natural resources are located, the trail surface would be excavated and covered, or minor realignment of trail will be performed to minimize potential impacts to these resources. Tables 3 summarizes DPR's proposed action for each trail segment currently in the Osborne Hill Area trail network proposed for removal and associated work and Table 4 summarizes DPRs proposed action for each trail segment in the proposed Osborne Hill trail network. DPR will evaluate the preferred option for each trail segment in an environmental compliance document required under CEQA.

6.0 OTHER

The Osborne Hill trail network road/trail surfaces will be monitored in perpetuity, including segments with elevated metals and covered with an aggregate cap. Information describing monitoring and maintenance requirements will be included in an Operations and Maintenance Agreement and a Land Use Covenant (LUC) with DTSC. Coordination with DTSC to complete these agreements will follow after project work is completed. An Operations Maintenance Plan will be implemented to assure that required protections are maintained.

The LUC will be prepared consistent with DTSC and DPR policy and finalized and recorded after physical remedial measures are implemented and before the site is certified by DTSC as being remediated. The LUC will run with the land and stay in effect as long as hazardous substances limit use of the property and until terminated by DTSC. Pursuant to Section 67391.1 of Title 22, Division 4.5, Chapter 39, California Code of Regulations, the project proponent will pay all costs including for DTSC oversight associated with the administration of the land use controls. DTSC has authority to require modification or removal of any land improvements placed in violation of the restrictions. Also, violation of the LUC will be grounds for DTSC to file civil or criminal actions as provided by law.

7.0 REFERENCES

- California Department of Parks and Recreation (DPR), 2008. Osborne Hill Proposed Trail Network. June 2008.
- California Department of Parks and Recreation, 2008. Draft, Initial Study/Mitigated Negative Declaration, Osborne Hill Trail Network Project. August 2008.
- California Environmental Protection Agency (Cal/EPA), 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties. January 2005. <http://www.calepa.ca.gov/Brownfields/documents/2005/CHHSLsGuide.pdf>
- California Environmental Protection Agency Department of Toxic Substances Control (DTSC), 2001. Information Advisory Clean Imported Fill Material. October, 2001. http://www.dtsc.ca.gov/Schools/upload/SMP_FS_Cleanfill-Schools.pdf
- California Environmental Protection Agency Department of Toxic Substances Control (DTSC), 2008. Comments of the Draft Trails MND, Empire Mine State Historic Park, 10556 East Empire Street, Grass Valley, California 95945, September 16, 2008. Department of Toxic Substances Control. P. Myers.
- Klein, Kimiko to Perry Myers, 2006. Memorandum regarding Remediation Goals for the Recreational Runner on Trails, Empire Mine State Historical (sic) Park, Grass Valley, September 29, 2006, Department of Toxic Substances Control. P. Myers.
- MFG, Inc. (MFG), 2006. Data Transmittal and Addendum for the Trails 2006 Priority Action Work Plan, Empire Mine State Historic Park. MFG, Inc., Fort Collins, Colorado. December 4.
- MFG, Inc. (MFG), 2007a. Data Gaps Report for the Empire Mine State Historic Park Phase 2: Data Gaps Analysis. Prepared for California Department Parks and Recreation and Newmont USA, Ltd. by MFG, Inc., Fort Collins, Colorado. January 15.
- MFG, Inc. (MFG), 2007b. Trails 2007 Action Work Plan, Empire Mine State Historic Park. Prepared for California Department Parks and Recreation and Newmont USA, Ltd. by MFG, Inc., Fort Collins, Colorado. July 21.
- MFG, Inc. (MFG), 2008. Data Transmittal Report for the Trails 2007 Action Work Plan. MFG, Inc., Fort Collins, Colorado. February 5.
- Rose, A.W., H. E. Hawkes, and J.S. Webb. 1979. Geochemistry in Mineral Exploration, 2nd ed. London. New York. Academic Press.

TABLES

FIGURES

ATTACHMENT A
DPR OSBORNE HILL PROPOSED TRAIL NETWORK

ATTACHMENT B

DATA TRANSMITTAL ADDENDUM FOR THE TRAILS 2007 ACTION WORK PLAN