

**MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU**

**ABANDONED HARDROCK MINE PRIORITY SITES
1995
SUMMARY REPORT**

Prepared For:

**Montana Department of State Lands
Abandoned Mine Reclamation Bureau
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Engineering Services Agreement DSL-AMRB No. 94-006

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1.0 INTRODUCTION

This document is a compilation of the 1993 and 1994 Hazardous Materials Inventory Summary Reports published by the Montana Department of State Lands/Abandoned Mine Reclamation Bureau (MDSL/AMRB). The Hazardous Materials Inventory was implemented to consistently characterize and rank the extent of environmental problems associated with the Abandoned Hardrock Mine Priority Sites.

The Hazardous Materials Inventory involved the investigation of 269 abandoned or inactive hardrock mine sites in 1993 and an additional 62 mines sites in 1994. This report summarizes the findings of 276 sites from the total 331 sites investigated. Fifty-five sites were dropped from the Abandoned Hardrock Mine Priority Sites list due to a lack of significant environmental hazards associated with the sites. The dropped sites are discussed in Section 4.0.

This report is organized into five sections. Section 1.0 presents the introduction, project objectives, a brief description of the project tasks, and a summary of the findings. Section 2.0 briefly describes field methods used during the inventory. Section 3.0 discusses data evaluation techniques and data management for the project. Section 4.0 presents a brief description of the Abandoned and Inactive Mines Scoring System (AIMSS), which was developed to rank the priority sites. Section 5.0 presents one-page summaries for each priority site. The summaries provide site-specific information, including volumes of wastes, contaminant concentrations, observed releases to surface water and groundwater, water quality criteria exceedances, and potential safety hazards.

This summary report is supported by several other project documents and databases, including:

- The Sampling and Analysis Plan (SAP) presents the sampling approach for the Abandoned Mines Hazardous Materials Inventory. This SAP also contains instructions on completing the Inventory Form and the Standard Operating Procedures (SOPs) for conducting the field sampling activities (AMRB/Pioneer, 1993a and 1994a).
- The Quality Assurance Project Plan (QAPjP) describes quality assurance procedures used for evaluating the field and laboratory data for the project (AMRB/Pioneer, 1993b and 1994b).
- The Laboratory Analytical Protocol (LAP) describes laboratory requirements for the project (AMRB/Pioneer, 1993c and 1994c).
- The Health and Safety Plan (HSP) describes practices and procedures to be followed by field investigators to minimize exposure to hazardous materials and to eliminate any possibility of physical injury (AMRB/Pioneer, 1993d and 1994d).

- The Abandoned Hardrock Mines Project Report is a compilation of the reports listed on the previous page, as well as this Summary Report, the AIMSS Report, the Data Validation/Evaluation Report, and the completed Hazardous Materials Inventory Forms for each site (AMRB/Pioneer, 1993e and 1994e).
- The Abandoned Hardrock Mine Priority Sites, Hazardous Materials Inventory Databases are database files containing all of the data collected from the 1993 and 1994 inventories.

The complete Abandoned Hardrock Mines Project Report including the 1993 and 1994 inventories can be viewed in Helena, Montana, at the Montana State Library; the MDSL/AMRB office; or the Montana Department of Health and Environmental Sciences/Solid and Hazardous Waste Bureau (MDHES/SHWB) office or in Missoula, Montana, at the United States Department of Agriculture/Forest Service (USFS), Region 1 office.

1.1 PROJECT OBJECTIVES

An estimated 6,000 abandoned or inactive hardrock mine and milling sites exist in Montana. This legacy of Montana's mining past has left a wide range of problems and challenges for the MDSL/AMRB and other state and federal agencies charged with reclaiming and mitigating of these problems.

The various problems associated with the abandoned and inactive hardrock mine sites range from safety hazards caused by hazardous mine openings, dangerous highwalls, and dilapidated structures to threats to human and non-human life and the environment by mining waste containing elevated heavy metals and other contaminants. To date, the MDSL/AMRB has worked to eliminate the problems of unsafe openings, highwalls, and structures and has made over 1,500 of these sites safer.

In 1991, the MDSL/AMRB concluded that substantial progress had been made in eliminating imminent hazards to public health and safety at abandoned hardrock mine sites. However, limited progress was realized regarding heavy metal and mineral processing reagent contamination of surface water and groundwater. Not only were these sites causing severe environmental degradation, but they were also the sites of highest public concern. Additionally, the MDSL/AMRB recognized a number of other state and federal programs that had resources available to address their problems but that there was no coordinated approach to determine which specific sites should be addressed first. As a result, the MDSL/AMRB solicited various state and federal agencies and requested assistance in identifying of suspected problem sites. The following agencies responded to the MDSL/AMRB's request: USFS-Region 1, the United States Department of the Interior/Bureau of Land Management (BLM), MDHES, and the Montana Department of Natural Resources and Conservation (DNRC). A list of the 269 suspect sites was compiled from the input of these agencies supplemented by a review of existing data from the MDSL/AMRB master inventory. This list included 269

of the highest potential hazard sites in Montana and these sites were investigated and inventoried during the 1993 field season. As a result of the 1993 inventory activities and continued records searches, 62 additional sites were identified, investigated, and ranked during the 1994 field season by the MDSL/AMRB. Of the 331 sites investigated, 55 sites were removed from the list due to a lack of significant environmental hazards (Section 4.0). A list of the remaining 276 sites is presented in Table 1-1.

The agencies previously listed agreed to a cooperative course of action, with MDSL/AMRB designated as the lead agency. The agencies established the following objectives:

- To identify and prioritize the abandoned mine sites that presently pose the most threats to public health and safety and the environment.
- To consistently collect data on each priority site to identify problems associated with each site and to directly compare and rank sites. All sampling and analysis methods strictly follow United States Environmental Protection Agency (EPA) protocols to ensure consistent and accurate results.
- To develop a long-term strategy using statutory and financial resources available to systematically reduce the hazards associated with the prioritized abandoned mine sites.

Once this report is completed, the first two objectives stated above will be fulfilled, and the framework to complete the third objective will be in place.

1.2 PROJECT DESCRIPTION

The priority sites investigated during the 1993 and 1994 field seasons under the Hazardous Materials Inventory were located in 23 counties and in 88 of the 206 mining districts in Montana. Site investigations conducted in 1993 and 1994 required 145 field days to collect the data.

The site investigation conducted at each site involved: overall site reconnaissance; mapping; collection of tailings, slag, waste rock, adit discharge, flooded shafts, stream water, and sediment samples; field analysis of solid matrix samples using an X-ray Fluorescence (XRF) Spectrometer; and measurements of field parameters in water, including flow rates, pH, specific conductance, temperature, oxidation reduction potential, and alkalinity. The field team members also photographed sample locations and significant site features, video taped the site, and evaluated safety hazards.

The 1993 field investigations were conducted in abnormally wet conditions. There were 69 days of measurable precipitation with a total accumulation of 11.2 inches of precipitation (measured in Butte, Montana). During the 1994 investigation period, there

TABLE 1-1: ABANDONED HARDROCK MINE PRIORITY SITES LIST

COUNTY	DISTRICT	SITE NAME	P.A. NO.
Beaverhead	Bannack	Apex Millisite	01-006
Beaverhead	Bannack	Gold Leaf/Priscilla	01-031
Beaverhead	Birch Creek	Indian Queen	01-034
Beaverhead	Elkhorn-South	Old Elkhorn	01-169
Beaverhead	Ermont	Ermont Mines/Millisite	01-005
Beaverhead	Hecla	Silver King	01-084
Beaverhead	Hecla	True Blue	01-138
Beaverhead	Hecla	Upper & Lower Cleve	01-143
Beaverhead	Hecla	Trapper	01-144
Beaverhead	Lemhi Pass	Last Chance No. 1/IER	01-216
Beaverhead	Lost Creek	Tungsten Millisite	01-170
Beaverhead	Wisdom	Clara	01-262
Beaverhead	Wisdom	Martin	01-270
Broadwater	Confederate	Miller Mountain	04-138
Broadwater	Heligate	Argo Mine/Millisite	04-015
Broadwater	Indian Creek	Park (Marietta)	04-012
Broadwater	Indian Creek	St. Louis	04-013
Broadwater	Indian Creek	Diamond Hill	04-020
Broadwater	Indian Creek	Bullion King	04-081
Broadwater	Radersburg	Ohio	04-009
Broadwater	Radersburg	Keating Tailings	04-121
Broadwater	Winston	Custer Millisite	04-006
Broadwater	Winston	East Pacific	04-008
Broadwater	Winston	Kleinschmidt	04-010
Broadwater	Winston	Vosburg	04-014
Broadwater	Winston	Golden Age	04-050
Broadwater	Winston	Sunrise/January	04-130
Broadwater	Winston	Chartam	04-501
Broadwater	Hughesville	Block P Tailings	07-090
Cascade	Hughesville	Bon Ton	07-094
Cascade	Neilhart	Broadwater	07-079
Cascade	Neilhart	Vilupa	07-080
Cascade	Neilhart	Hartley	07-082
Cascade	Neilhart	Motton	07-084
Cascade	Neilhart	Queen of the Hills	07-085
Cascade	Neilhart	Evening Star Mine/Millisite	07-087
Cascade	Neilhart	Compromise	07-100
Cascade	Neilhart	Carpenter Creek Tailings	07-103
Cascade	Neilhart	Rochester	07-110
Cascade	Neilhart	Silver Belt	07-111
Cascade	Neilhart	Fairplay	07-112
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COUNTY	DISTRICT	SITE NAME	P.A. NO.
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Cascade	Neilhart	Sherman No. 2 - SW	07-142
Cascade	Neilhart	Emma	07-144
Cascade	Neilhart	Big Seven	07-156
Cascade	Neilhart	Rebellion Mine (Upper & Lower)	07-157
Cascade	Neilhart	Ripple Mines	07-163
Cascade	Neilhart	Lexington No. 4	07-167
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Deer Lodge	Silver Lake	Cable	12-002
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Fergus	Warm Springs	Tail Holt	14-010
Fergus	Warm Springs	Cumberland	14-017
Fergus	Warm Springs	Prestor John	14-090
Flathead	Hog Heaven	Flathead Mine	15-012
Gallatin	Bozeman	Karst Asbestos	18-018
Granite	Alps	Alps	20-065
Granite	Alps	Argo	20-081
Granite	Antelope Creek	Silver King	20-186
Granite	Antelope Creek	Lori No. 13	20-191
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Granite	Combination	Combination Millisite	20-009
Granite	Dunkleburg	Forest Rose	20-004
Granite	Dunkleburg	Wasa	20-023
Granite	Dunkleburg	Jackson Park	20-027
Granite	Frog Pond	Millers Mine	20-176
Granite	Garnet	Free Coin/Red Cloud	20-134
Granite	Maxville	Maxville Tailings (Londonderry)	20-209
Granite	Moose Lake	Banner	20-175
Granite	Moose Lake	Old Dominion	20-180
Granite	Phillipsburg	Bi-Metallic/Old Red	20-002
Granite	Phillipsburg	Douglas Creek Tailings	20-003
Granite	Phillipsburg	Algonquin	20-005
Granite	Phillipsburg	Rumsey Mine/Millisite	20-018
Granite	Phillipsburg	Scratch All	20-019
Granite	Phillipsburg	Trout	20-062
Granite	Phillipsburg	Little Gem	20-071
Granite	Phillipsburg	Wenger No. 2	20-073
Granite	Phillipsburg	Granite Mountain	20-110
Granite	Phillipsburg	True Fissure	20-111
Granite	South Boulder	Nonpareil	20-012
Granite	South Boulder	Brooklyn	20-025
Jefferson	Alhambra	Middle Fork Warm Springs	22-046
Jefferson	Alhambra	Alhambra Hot Springs	22-049
Jefferson	Alhambra	Solar Silver	22-054
Jefferson	Basin	Bullion	22-008

TABLE 1-1: ABANDONED HARDROCK MINE PRIORITY SITES LIST (Cont'd)

COUNTY	DISTRICT	SITE NAME	P.A. NO.
Jefferson	Basin	Josephine	22-031
Jefferson	Basin	Basin Millsite	22-036
Jefferson	Basin	Perry's Park	22-039
Jefferson	Basin	Buckeye	22-072
Jefferson	Basin	Enterprise	22-074
Jefferson	Basin	Doris	22-293
Jefferson	Basin	Jack Creek Tailings	22-296
Jefferson	Basin	Lady Leith	22-316
Jefferson	Basin	Old Basin Millsite	22-500
Jefferson	Basin	Manlie (East)	22-032
Jefferson	Cataract	Crystal	22-073
Jefferson	Cataract	Eva May	22-075
Jefferson	Cataract	Morning Glory	22-077
Jefferson	Cataract	Crescent/Alasce	22-106
Jefferson	Cataract	Boulder Chief	22-132
Jefferson	Cataract	Rocker/Ada	22-170
Jefferson	Cataract	Nellie Grant	22-244
Jefferson	Clancy	General Grant	22-245
Jefferson	Clancy	Alta	22-001
Jefferson	Colorado	Bertha	22-002
Jefferson	Colorado	Bluebird	22-003
Jefferson	Colorado	Corbin Flats	22-004
Jefferson	Colorado	Gregory	22-005
Jefferson	Colorado	Washington	22-007
Jefferson	Colorado	Crawley Camp	22-028
Jefferson	Colorado	Argentine	22-102
Jefferson	Colorado	Wickes Smelter	22-358
Jefferson	Elkhorn	Elkhorn Queen	22-027
Jefferson	Elkhorn	Queen (Tourmaline)	22-111
Jefferson	Elkhorn	Tacoma	22-284
Jefferson	Elkhorn	Sourdough	22-336
Jefferson	Elkhorn	Carmody	22-337
Jefferson	Elkhorn	Iron	22-359
Jefferson	Elkhorn	Trumley Heap Leach	22-501
Jefferson	Elkhorn	Elkhorn Creek Tailings	22-502
Jefferson	High Ore	Comet Tailings	22-009
Jefferson	High Ore	Grey Eagle	22-029
Jefferson	Hughesville	Block P Mine	23-001
Judith Basin	Hughesville	Marcelline	23-022
Judith Basin	Hughesville	Belt Patent	23-035
Judith Basin	Hughesville	NE NE S7 (Lucky Strike)	23-042
Judith Basin	Hughesville	Wright Lode	23-045
Judith Basin	Hughesville	Edwards Lode	23-046
Judith Basin	Hughesville	Harrison/Moulton	23-056
Judith Basin	Hughesville	Moulton	23-058
Judith Basin	Hughesville	Tiger	23-059
Judith Basin	Hughesville	Danny T	23-500

COUNTY	DISTRICT	SITE NAME	P.A. NO.
Lewis & Clark	Helena	Spring Hill Tailings	25-087
Lewis & Clark	Helena	Joslyn Street Tailings	25-501
Lewis & Clark	Lincoln	Seven-Up Pete/Rover	25-020
Lewis & Clark	Lincoln	Blackfoot Tailings	25-322
Lewis & Clark	Marysville	Drumhomon Mine/Mill/Tailings	25-024
Lewis & Clark	Marysville	Bald Mountain	25-081
Lewis & Clark	Marysville	Big Ox Millsite	25-115
Lewis & Clark	Marysville	Big Ox Mine	25-116
Lewis & Clark	Marysville	Belmont	25-187
Lewis & Clark	Marysville	Pagan/Gloster Millsite	25-172
Lewis & Clark	Marysville	Empire Millsite	25-175
Lewis & Clark	Marysville	Bald Butte Millsite	25-179
Lewis & Clark	Marysville	Wildcat	25-317
Lewis & Clark	Marysville	Goldsil Millsite	25-365
Lewis & Clark	Orphir	Victory/Evening Star	25-010
Lewis & Clark	Rimini	Tennile Mine	25-005
Lewis & Clark	Rimini	Peerless Jenny/King	25-006
Lewis & Clark	Rimini	Red Water	25-007
Lewis & Clark	Rimini	Valley Forge/Susie	25-008
Lewis & Clark	Rimini	Red Mountain (13)	25-019
Lewis & Clark	Rimini	Lower Tennile Millsite	25-030
Lewis & Clark	Rimini	Armstrong	25-102
Lewis & Clark	Rimini	Beatrice	25-103
Lewis & Clark	Rimini	Woodrow Wilson	25-258
Lewis & Clark	Rimini	Peter	25-259
Lewis & Clark	Rimini	Queensbury	25-262
Lewis & Clark	Rimini	Monte Cristo	25-275
Lewis & Clark	Rimini	Upper Valley Forge	25-280/282
Lewis & Clark	Rimini	National Extension	25-287
Lewis & Clark	Rimini	Monitor Creek Tailings	25-503
Lewis & Clark	Rimini	Bear Gulch	25-504
Lewis & Clark	Scratchgravel	Franklin	25-339
Lewis & Clark	Stemple	NE NW S13	25-197
Lewis & Clark	Stemple	Swansea Tailings/Mine	25-208
Lewis & Clark	Stemple	SE SW S10	25-212
Lewis & Clark	Stemple	Astor	25-227
Lewis & Clark	Stemple	Jay Gould Mine/Millsite	25-500
Lincoln	Libby	Snowshoe	27-005
Lincoln	Libby	Cherry Creek Millsite	27-006
Madison	Norris/Red Bluff	Boaz	29-013
Madison	Norris/Red Bluff	Grubstake	29-399
Madison	Pony	Atlantic & Pacific	29-033
Madison	Pony	Boas Tweed	29-034
Madison	Pony	Garnet Gold Mine	29-035
Madison	Pony	Strawberry	29-038
Madison	Pony	Chicago Mining Corp. Pony Mill	29-500
Madison	Rochester	Emma	29-061

TABLE 1-1: ABANDONED HARDROCK MINE PRIORITY SITES LIST (Cont'd)

COUNTY	DISTRICT	SITE NAME	P.A. NO.
Missoula	Ninemile	Joe Wallit	32-010
Missoula	Ninemile	Lost Cabin	32-011
Missoula	Ninemile	Nugget	32-042
Missoula	Woodman	Ward Lode	32-005
Park	Emigrant	Allison	34-018
Park	New World	Great Republic Smelter	34-000
Park	New World	McLaren Tailings	34-004
Park	New World	Lower Glengarry	34-006
Park	New World	Gold Dust	34-007
Park	New World	Little Daisy	34-009
Park	New World	McLaren Mine	34-010
Park	New World	Black Warrior	34-079
Park	New World	Upper Alice E.	34-085
Park	New World	Fisher Creek No. 1	34-090
Powell	Elliston	Charter Oak	39-003
Powell	Elliston	Lily/Orphan Boy	39-006
Powell	Elliston	Monarch	39-008
Powell	Elliston	Ontario Millsite	39-010
Powell	Elliston	Golden Anchor	39-012
Powell	Elliston	Hard Luck	39-014
Powell	Elliston	Kimball	39-018
Powell	Elliston	Sure Thing	39-020
Powell	Elliston	Julia	39-022
Powell	Elliston	Telegraph	39-023
Powell	Elliston	Third Term	39-024
Powell	Elliston	Anna R./Hattie M.	39-044
Powell	Elliston	Mountain View	39-062
Powell	Emery	Emery	39-004
Powell	Curlew	Curlew	41-003
Ravalli	Frog Pond	Montana Prince	41-004
Ravalli	Pleasant View	Blue Bird	41-009
Sanders	Blue Creek	Broken Hill	45-005
Sanders	Plains	Montro Gold	45-010
Sanders	Plains	Lower Letterman	45-047
Sanders	Trout Creek	Holiday (Silver Mark)	45-009
Sanders	White Pine	Jack Waite	45-002
Silver Bow	Basin Creek	Highland Mine	47-028
Silver Bow	Elk Park	Mary Emmee/Clinton	47-035
Silver Bow	Elk Park	Rising Sun	47-037
Silver Bow	Melrose	Old Glory	47-027
Silver Bow	Melrose	Clipper	47-029
Silver Bow	Moose Creek	Middle Fork Millsite	47-081
Stillwater	Stillwater	Benbow Millsite	48-005
Sweet Grass	Independence	Yager/Daisy	49-002

COUNTY	DISTRICT	SITE NAME	P.A. NO.
Madison	Rochester	Thistle Mine/Millsite	29-073
Madison	Rochester	Wabecca	29-075
Madison	Sheridan	Smuggler	29-010
Madison	Sheridan	Goldschmidt-Steiner	29-078
Madison	Sheridan	Red Pine	29-079
Madison	Sheridan	Broadgauge	29-293
Madison	Sheridan	Latest Out	29-354
Madison	Sheridan	Uncle Sam	29-383
Madison	Sheridan	Lakeshore	29-436
Madison	Sheridan	Buckeye	29-451
Madison	Sheridan	SE SW S26 (Keynote)	29-474
Madison	Sheridan	NW SE S26	29-476
Madison	Silver Star	Broadway/Victoria	29-179
Madison	South Boulder	Mammoth	29-008
Madison	South Boulder	Mammoth Tailings	29-082
Madison	Tidal Wave	B&H	29-083
Madison	Tidal Wave	Dry Gulch South	29-282
Madison	Virginia City	U.S. Grant	29-095
Madison	Virginia City	Belle	29-098
Madison	Virginia City	Kearsage	29-102
Madison	Virginia City	Apex	29-105
Madison	Virginia City	Pacific	29-118
Madison	Virginia City	Easton	29-121
Madison	Virginia City	Prospect	29-136
Madison	Washington	Missouri	29-373
Madison	Washington	SE SE S25	29-394
Meagher	Beaver Creek	Bigler	30-067
Meagher	Castle Mountain	Cumberland	30-004
Meagher	Castle Mountain	Belle of the Castle	30-007
Meagher	Smith River	SW NE S10	30-078
Mineral	Iron Mountain	Iron Mountain Millsite	31-010
Mineral	Iron Mountain	Belle of the Hills	31-072
Mineral	Iron Mountain	Dillon Millsite	31-073
Mineral	Keystone	Nancy Lee Mine	31-001
Mineral	Keystone	Little Anaconda	31-077
Mineral	Keystone	Nancy Lee Millsite	31-082
Mineral	Keystone	Nancy Lee Millsite - Slowey	31-090
Mineral	Packer Creek	Tarbox-Mineral King	31-003
Mineral	Packer Creek	Saltstete Consolidate	31-021
Missoula	Clinton	Wallace Creek Millsite	32-019
Missoula	Copper Cliff	Copper Cliff	32-001
Missoula	Copper Cliff	Frogs Diner	32-027
Missoula	Crammer Creek	Linton	32-017
Missoula	Elk Creek	Morse & Kennedy	32-033

were 22 days of measurable precipitation with a total accumulation of only 3.40 inches of precipitation (measured in Butte, Montana). The reduced amount of precipitation in 1994 may have resulted in a decrease in the observed and, therefore, documented releases to surface water that would have been occurring under 1993 conditions. The 40-year average accumulation for this period is 6.4 inches for the same location.

The physical setting and topography associated with these sites ranged from gently sloping land in valley bottoms to very steep, high elevation, mountainous areas. Site access was often difficult due to poor road conditions or to the absence of maintained roads. Several sites were accessed by foot or by helicopter only. Ownership of the priority sites was a mix of public lands (USFS, BLM, MDSL, etc.) and patented lands (private ownership). The priority sites consisted of primarily inactive/abandoned mine sites; however, exploration activities were in progress at several sites.

Significant features at the sites included tailings ponds, impoundments, and piles; waste rock dumps or piles; mine openings, including adits, shafts, glory holes, and exploration trenches; miscellaneous buildings and structures; and roads. Mine opening discharges and streams adjacent to or flowing through the sites were common.

Hazardous materials observed at some of the sites included chemical reagents, solvents, asbestos-containing material, petroleum fuels or lubricating oils storage (barrels or tanks), and miscellaneous power supply items (poles, transformers, lines, etc.). Some of the sites support wildlife, domestic grazing, or aquatic life. Residential occupation of the sites was observed in rare cases; however, residences adjacent to the sites occurred more frequently.

1.3 SUMMARY OF FINDINGS

The following information is provided as an overview of the data compiled during the 1993 and 1994 investigations for the Hazardous Materials Inventory.

Laboratory Sampling

- Total number of laboratory samples: 1,963 (does not include the quality assurance/quality control [QA/QC] duplicates), representing approximately 43,200 data points generated by the laboratories.
- Total number of XRF Spectrometer samples: 3,690 (does not include the QA/QC duplicates), representing approximately 77,500 data points.

Waste Rock Associated with the Priority Sites

- Estimated total volume: 6,983,000 cubic yards.
- Estimated total area: 16,869,000 square feet (387 acres).
- Estimated total unvegetated/uncovered area: 15,562,000 square feet (357 acres).

Mill Tailings Associated with the Priority Sites

- Estimated total volume: 8,550,000 cubic yards.
- Estimated total area: 21,671,000 square feet (498 acres).
- Estimated unvegetated/uncovered area: 14,214,000 square feet (326 acres).

Adit Discharges Associated with the Priority Sites

- Total number of discharging adits: 198.
- Number of adit discharges with pH $\leq$ 5.00: 33.
- Number of adit discharges with pH $\leq$ 6.00: 48.

Flooded Shafts Associated with the Priority Sites

- Total number of open shafts with water: 13.
- Shafts with pH $\leq$ 5.00: 3.

Water Quality Criteria

- Number of discharges exceeding Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs): 93 (87 were adits and 6 were shafts).
- Number of adit discharges exceeding acute aquatic life criteria: 76.
- Number of observed releases to surface water/sediment directly attributable: 148.

2.0 INVESTIGATION METHODS

2.1 DATABASE AND LITERATURE SEARCH

Data collected in the field was supplemented by an extensive literature search and by using several computer databases. This supplemental information was used to complete the inventory forms and to fulfill receptor information requirements for the AIMSS. The computer databases used to collect this information were:

- The Montana Bureau of Mines and Geology (MBMG) Well Logs Database, which was compiled by the MBMG and the DNRC. This database was used to estimate the number of wells within a one-mile and a four-mile radius of each site.
- The Montana Rivers Information System (MRIS), which was compiled by the Montana State Library for the Montana Department of Fish, Wildlife, and Parks (MDFWP). This database was used to classify riparian habitat quality, wetlands frontage, fisheries habitat and species classification, and sport fisheries classification for stream reaches potentially impacted by each site.
- The MDHES/Water Quality Bureau (WQB) - Community Water Supplies Database provided a list of surface water resources presently used for drinking water supplies in Montana.

Additional information was obtained from the following sources:

- Peak and average stream flow estimates were obtained from United States Department of Interior/Geological Survey (USGS) flow monitoring reports on gaged streams.
- Population estimates were obtained by counting buildings delineated on the USGS quadrangle maps and USFS Forest Visitors Maps. Field observations supplemented this information.
- Land ownership was determined from MDL/AMRB records or USFS Forest Visitor Maps.
- Historic mine/millsite operations, mineralogy, and geology were obtained from several sources, including United States Bureau of Mines (USBM) circulars; USGS bulletins and professional papers; and MBMG memoirs, bulletins, and circulars.

- Historic analytical data were obtained from the MDSL/AMRB project files, the MDHES/SHWB project files, the MDHES/WQB, USFS project files, and MBMG data collected for the USFS. This data was reviewed before site visits to provide the investigators with background information on potential site hazards.

2.2 FIELD METHODS

A detailed discussion of specific investigation methodologies is found in the MDSL/AMRB Hazardous Materials Inventory SAP (AMRB/Pioneer, 1993a and 1994a). This section describes some of the unique details of the investigative methods used to fulfill the project objectives.

The inventory form used during the 1994 investigation was almost identical to the 1993 form except for some with minor improvements that removed redundancies and streamlined decision-making processes. The inventory form is used during the investigation to guide and focus the investigative tasks to ensure consistent evaluation of each site. Literature and database searches were performed before the field investigations to provide investigators with background information on each site.

Sampling was performed on waste rock dumps, mill tailings, streams, ponds, adit discharges, flooded shafts, and on domestic groundwater wells or monitoring wells, when present.

Each tailing's feature was characterized both spatially and vertically by hand-auguring to determine accurate depths and to delineate stratification or differences in metals concentrations between the upper-oxidized zone(s) and the lower reduced zones. Subsamples were collected from each visually different strata.

Typically, several subsamples were collected from each waste rock dump to better characterize very heterogeneous waste sources. Subsamples from the tailings and waste rock were analyzed in the field using an XRF Spectrometer. The field screening data allowed the investigators to make informed decisions on the number of samples required for laboratory analyses and indicated how best to composite the subsamples from the potential sources to send representative samples to the laboratory, while minimizing the number of samples to achieve this end. The XRF Spectrometer analyses also provided an increased number of valid and discrete data points per site achieving a more thorough understanding of the problems associated with each site. Solids were characterized additionally by measuring pH and radioactivity.

Stream sediment samples were also analyzed in the field using the XRF Spectrometer to assist in assessing the extent of contamination and migration from the waste sources.

Surface water sampling was often conducted to characterize impacts to drainage basins, as well as contributions from individual sites when multiple sources were present. Waters were additionally characterized in the field by measuring flow rates, pH, specific conductance, alkalinity, and temperature.

Site mapping was conducted using standard "Chain and Compass" surveying techniques during the 1993 field season and the Global Positioning System during the 1994 field season. Mapping was primarily conducted to estimate the volume and area of waste sources and record sample locations. Other significant site features, such as streams or drainages, roads, mine openings, and structures, were also recorded on the site sketches. Sample locations and other significant site features were documented on photographic slides and video tape to assist the resource managers in evaluating the priority sites.

3.0 DATA EVALUATION AND COMPARISONS

This section discusses data quality validation and evaluations, as well as comparisons of the data to pertinent criteria.

3.1 DATA VALIDATION AND EVALUATION

3.1.1 Laboratory Data Validation and Evaluation

The laboratory used during this investigation complied all of the QA/QC performance requirements defined in the EPA Contract Laboratory Program (CLP) Statement of Work (SOW, March 1990). The data packages provided by the laboratory allowed comprehensive data validation and evaluation procedures to be completed. Laboratory data validation and evaluation were performed according to guidelines developed by the EPA.

The laboratory data were validated in accordance with Laboratory Data Validation Functional Guidelines for Evaluating Inorganics (EPA, 1988). The data validation procedures were performed partially by laboratory chemists and partially by a data reviewer from Pioneer Technical Services, Inc. The data validation procedure evaluated:

- holding times;
- initial and continuing calibrations;
- calibration and preparation blanks;
- inductively coupled plasma (ICP) interference check samples;
- laboratory control samples (LCS);
- laboratory duplicate sample analyses (precision assessment);
- matrix spike sample analyses (accuracy assessment);
- furnace atomic absorption (AA) quality control;
- ICP serial dilutions;
- sample result verification;
- field duplicate analyses (precision assessment);
- field blank analyses; and
- overall data for the case.

Data evaluation occurred after the data validation process was completed and the appropriate qualifiers had been applied to the data. The data evaluation process involved a statistical analysis of the data to identify outliers and to assess the overall quality of the data. Data evaluation was performed on the laboratory data which met the Data Quality Objectives (DQOs) outlined in the QAPjP for the Abandoned Mines Hazardous Materials Inventory (AMRB/Pioneer, 1993b and 1994b).

Although numerous qualifications (flags) were applied to the laboratory data compiled during this investigation, and a small portion of the data were evaluated as outliers, none of the data were flagged "R" or were otherwise considered unusable. Consequently, 100 percent of the laboratory data (soil and water) collected during this investigation are considered valid and useable for all objectives of this project.

The data's limitations should be considered when making interpretations. Please refer to Data Validation and Evaluation Report for the Abandoned Mines Hazardous Materials Inventory (AMRB/Pioneer, 1993f and 1994f) for a detailed description of the procedures followed and results provided by the overall data assessments.

3.1.2 X-Ray Fluorescence Spectrometer Data Validation

Data provided by the field portable XRF Spectrometer were also validated; the XRF data were validated according to manufacturer specifications. The validation procedures for XRF data were not nearly as rigorous as for laboratory data; consequently, additional procedures, using standard statistical techniques, were employed to evaluate the overall quality of the XRF data. These additional procedures included assessment of XRF duplicate data to quantify precision, as well as comparing XRF data to corresponding laboratory data to assess inter-method precision and correlation.

The comprehensive evaluation of the XRF data determined that inter-method precision was good for all analytes, and the XRF data showed excellent correlation with the laboratory data.

3.1.3 Other Field Measurements

Field parameter measurements, such as pH, Eh, and specific conductance, were not evaluated for data quality. SOPs (AMRB/Pioneer, 1993a and 1994a) were carefully followed in the field to achieve a consistent and acceptable level of quality.

3.2 DATA INTERPRETATION

The analytical data collected were compared to site-specific background or upgradient concentrations, as well as to drinking water standards and aquatic life criteria. The following sections explain how these comparisons were made.

3.2.1 Background Soil Comparison

Background soil samples were collected to establish the extent to which metals concentrations were elevated in comparison to the local background. Background samples were typically applied to groups of sites within close proximity to one another and within similar geologic units.

3.2.2 Observed Releases to Groundwater, Surface Water, and Sediment

An observed release to surface water is defined as a downstream surface water or stream sediment concentration at more than three times the upstream surface water or sediment concentration for any constituent that can be attributed to the site.

Groundwater, surface water, and stream sediment analytical data were used to document observed releases from the priority sites.

3.2.3 MCL/MCLG, and Aquatic Life Criteria Comparisons

MCLs and MCLGs are drinking water standards promulgated under the federal SDWA (40 CFR Parts 141, 143). MCLs and MCLGs apply to public water systems; however, they may be relevant and appropriate to surface or groundwater if those waters are used as drinking water. Groundwater and surface water metals concentrations observed in samples collected were evaluated against these standards. The current SDWA MCLs and MCLGs expressed in micrograms per liter (ug/L) are:

Arsenic: 50 ug/L	Barium: 2,000 ug/L	Cadmium: 5 ug/L
Copper: 1,300 ug/L	Chromium: 100 ug/L	Mercury: 2 ug/L
Nickel: 100 ug/L	Antimony: 6 ug/L	Lead: 15 ug/L
Cyanide: 200 ug/L		

Surface water and mine discharge analytical results were also evaluated against freshwater acute and chronic aquatic life criteria (MDHES/WQB, 1994). Some of these criteria are expressed as a function of total hardness and were corrected for the hardness measured in each sample, when applicable.

3.3 DATA MANAGEMENT

The data collected under this project has been input into the data manager, dBase IV - Version 2.0. Four files were created to contain the data and to aid in manipulating the data, if desired. These files are summarized briefly below.

- PTSDATA.DBF contains field data collected for each sample during the Hazardous Materials Inventory.
- XRFDATA.DBF contains the analyses done by the field XRF data generated during the Hazardous Materials Inventory.
- LABDATA.DBF contains the data from all of the laboratory analyses performed during the Hazardous Materials Inventory.
- PRIORITY.DBF is the modified dBase file provided to Pioneer by MDSL/AMRB from the master inventory.

The information from these four files can be readily combined with one another to form a relational database.

4.0 SITE RANKING

The final task of the Hazardous Materials Inventory involved the development of a system to rank the severity of hazards or environmental threats associated with the sites investigated to assist the MDSL/AMRB in prioritizing reclamation efforts and in allocating resources. This system, the Abandoned and Inactive Mines Scoring System (AIMSS), closely follows the EPA's Hazard Ranking System although the AIMSS is specifically focused on potential hazards typically associated with the abandoned or inactive hardrock mines.

The AIMSS also evaluated potential safety hazards associated with the sites such as hazardous mine openings, highwalls, and structures, and generated a separate safety score for each site. The AIMSS used the data collected for each site to assign a ranking score.

The AIMSS is focused towards the physical site setting and potential hazards associated with abandoned and inactive mines due to its capability to evaluate mine opening discharges and large quantities of mine wastes. The AIMSS scoring method evaluates relative risks between sites which accounts for site-specific contaminant concentrations and the varying toxicity of different constituents, as well as adit discharges in the source evaluation. This scoring method more effectively discriminates between sites with higher concentrations or more toxic constituents in relation to sites with lower concentrations or less toxic constituents. To generate an overall Mine Site Human Health and Environmental Hazard Score, the AIMSS evaluates the groundwater pathway, surface water pathway, air pathway, and direct contact pathway. Under each pathway, the AIMSS evaluates observed releases, potential to release, pathway characteristics, waste characteristics, and targets.

Table 4-1 lists the screened priority sites and their associated AIMSS score, sorted in descending order. Three of the 276 sites were not ranked due to complications with inaccessibility; therefore, no data was collected.

The AIMSS also generates a distinct safety score for each site by evaluating site accessibility and safety hazards present (i.e., shafts, stopes, open adits, hazardous structures, and explosives/other hazardous materials or chemicals). Table 4-2 lists the screened priority sites and their associated safety score, sorted in descending order.

The Hazardous Materials Inventory involved the investigation of 331 abandoned or inactive hardrock mine sites. Fifty-five sites were dropped from the Abandoned Hardrock Mine Priority Sites list due to a lack of any significant environmental hazards associated with these sites. Table 4-3 lists the dropped sites. These sites were removed from the priority list because they did not represent a significant risk to human health or the environment for one or more of the following reasons:

- The site did not contain significant concentrations or quantities of heavy metals or other potentially hazardous materials;
- Contaminant migration pathways were not present to potentially impact human health or the environment;
- Active mining was occurring on the sites at the time of the investigation, preventing accurate characterization of the risks as an abandoned or inactive mine site; or
- Sites had been previously reclaimed and risks to human health and the environment had been adequately addressed.

The sites dropped may require additional evaluation at some time in the future due to the potential for changing site conditions or regulatory statutes. These sites may be reinstated on the Abandoned Hardrock Mine Priority Sites List, if warranted.

TABLE 4-1: ABANDONED HARDROCK MINES PRIORITY SITES AIMSS RANKING

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SCORE
1	Jefferson	Colorado	Corbin Fats	22-004	4694.70
2	Lewis & Clark	Helena	Joslyn Street Tailings	25-501	1892.74
3	Lewis & Clark	Rimni	Red Mountain (13)	25-019	1628.48
4	Lewis & Clark	Rimni	National Extension	25-287	1305.48
5	Powell	Emery	Emery	39-004	880.35
6	Lewis & Clark	Rimni	Red Water	25-007	878.88
7	Ravalli	Culw	Culw	41-003	707.94
8	Lewis & Clark	Marysville	Pegant/Gloster Millsite	25-172	540.51
9	Cascade	Hughesville	Block P Tailings	07-090	536.80
10	Jefferson	High Ore	Cornet Tailings	22-009	510.15
11	Powell	Elston	Charter Oak	39-003	490.37
12	Lewis & Clark	Helena	Spring Hill Tailings	25-067	456.34
13	Granite	Philpsburg	Douglas Creek Tailings	20-003	349.49
14	Judith Basin	Hughesville	Block P Mine	23-001	326.17
15	Jefferson	Colorado	Alta	22-001	262.17
16	Jefferson	Colorado	Washington	22-007	250.19
17	Jefferson	Basin	Enterprise	22-074	245.83
18	Granite	Philpsburg	Scratch All	20-019	240.84
19	Lewis & Clark	Marysville	Empire Millsite	25-175	240.15
20	Broadwater	Indian Creek	Park (Marietta)	04-012	240.02
21	Jefferson	Catact	Crystal	22-073	239.13
22	Flathead	Hog Heaven	Flathead Mine	15-012	197.97
23	Lewis & Clark	Marysville	Goldtail Millsite	25-365	180.54
24	Mineral	Keystone	Nancy Lee Millsite - Stowey	31-090	175.59
25	Lewis & Clark	Rimni	Peerless Jenny/King	25-006	169.49
26	Broadwater	Winston	East Pacific	04-008	168.83
27	Lewis & Clark	Scratchgravel	Franklin	25-339	160.95
28	Judith Basin	Hughesville	Edwards Lode	23-046	152.66
29	Jefferson	Clancy	Nellie Grant	22-244	135.63
30	Granite	Combination	Combination Millsite	20-009	131.76
31	Cascade	Nehart	Carpenter Creek Tailings	07-103	131.24
32	Lewis & Clark	Rimni	Valley Forge/Susie	25-008	126.10
33	Cascade	Nehart	Silver Dyke Adit	07-135	125.98
34	Broadwater	Winston	Voeburg	04-014	114.32
35	Lewis & Clark	Rimni	Armstrong	25-102	108.59
36	Jefferson	Basin	Bullion	22-008	99.26
37	Silver Bow	Basin Creek	Highland Mine	47-028	98.44
38	Park	New World	Great Republic Smelter	34-000	97.89
39	Lewis & Clark	Rimni	Lower Tennille Millsite	25-030	97.38
40	Madison	Norris/Red Bluff	Boaz	29-013	82.80
41	Granite	Philpsburg	Wenger No. 2	20-073	81.42
42	Lewis & Clark	Rimni	Tennille Mine	25-005	79.57
43	Meagher	Castle Mountain	Cumberland	30-004	76.22
44	Mineral	Keystone	Nancy Lee Millsite	31-082	73.39
45	Cascade	Nehart	Silver Dyke Tailings	07-137	72.88
46	Lewis & Clark	Rimni	Upper Valley Forge	25-280/282	72.21
47	Missoula	Crammer Creek	Linton	32-017	70.47

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SCORE
48	Lincoln	Libby	Snowshoe	27-005	69.39
49	Granite	Maxville	Maxville Tailings (Londonderry)	20-209	65.81
50	Lewis & Clark	Marysville	Bald Butte Millsite	25-179	60.47
51	Granite	Philpsburg	Trout	20-062	58.40
52	Lewis & Clark	Rimni	Monte Cristo	25-275	55.69
53	Jefferson	Basin	Buckeye	22-072	55.65
54	Jefferson	Elkhorn	Elkhorn Creek Tailings	22-502	53.99
55	Granite	Philpsburg	Bi-Metallic/Old Red	20-002	52.19
56	Beaverhead	Emont	Ermont Mines/Millsite	01-005	49.77
57	Jefferson	Colorado	Gregory	22-005	47.24
58	Madison	Rochester	Thistle Mine/Millsite	29-073	47.02
59	Jefferson	Alhambra	Middle Fork Warm Springs	22-048	46.31
60	Madison	Pony	Garnet Gold Mine	29-035	45.73
61	Silver Bow	Elk Park	Mary Emmes/Clinton	47-035	43.11
62	Cascade	Nehart	Queen of the Hills	07-085	40.68
63	Cascade	Nehart	Nehart Tailings	07-134	40.07
64	Sanders	Plains	Montro Gold	45-010	40.01
65	Madison	Rochester	Emma	29-061	38.99
66	Granite	Philpsburg	Granite Mountain	20-110	38.66
67	Madison	Sheridan	Buckeye	29-451	37.86
68	Madison	South Boulder	Mammoth Tailings	29-082	34.00
69	Jefferson	Colorado	Bluebird	22-003	32.49
70	Granite	Dunkleburg	Forest Rose	20-004	30.90
71	Powell	Elliston	Lily/Orphan Boy	39-006	29.34
72	Judith Basin	Hughesville	Wright Lode	23-045	29.30
73	Cascade	Nehart	Silver Dyke Millsite	07-138	29.19
74	Granite	South Boulder	Brooklyn	20-025	28.72
75	Madison	Sheridan	SE SW S28 (Keynote)	29-474	28.38
76	Judith Basin	Hughesville	Harrison/Moulton	23-056	28.00
77	Jefferson	Basin	Josephine	22-031	28.80
78	Broadwater	Winston	Sunrise/January	04-130	26.59
79	Lewis & Clark	Rimni	Queensbury	25-262	26.24
80	Madison	Washington	Missouri	29-373	24.44
81	Cascade	Nehart	Dacotah	07-121	22.34
82	Jefferson	Colorado	Bertha	22-002	21.92
83	Beaverhead	Bannack	Gold Leaf/Priscilla	01-031	21.03
84	Missoula	Woodman	Ward Lode	32-005	19.34
85	Deer Lodge	Silver Lake	Gold Coin	12-004	18.84
86	Granite	South Boulder	Nonpareil	20-012	18.44
87	Gallatin	Bozeman	Karat Asbestos	16-018	17.30
88	Jefferson	Elkhorn	Camody	22-337	16.48
89	Lewis & Clark	Marysville	Big Ox Millsite	25-115	16.04
90	Powell	Elliston	Ontario Millsite	39-010	15.97
91	Granite	Philpsburg	Algonquin	20-005	15.93
92	Madison	Virginia City	Prospect	29-136	15.91
93	Madison	Silver Star	Broadway/Victoria	29-179	15.84
94	Madison	Virginia City	Pacific	29-118	14.46

TABLE 4-1: ABANDONED HARDROCK MINE PRIORITY SITES AIMSS RANKING (Cont'd)

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	AIMSS SCORE
95	Madison	South Boulder	Mammoth	29-008	13.91
96	Lewis & Clark	Stemple	NE NW S13	25-197	13.77
97	Sanders	Blue Creek	Broken Hill	45-005	13.75
98	Lincoln	Libby	Cherry Creek Millsite	27-006	13.22
99	Beaverhead	Lost Creek	Tungsten Millsite	01-170	13.21
100	Beaverhead	Hedra	Upper & Lower Cleve	01-143	12.95
101	Broadwater	Winston	Kleinschmidt	04-010	12.77
102	Lewis & Clark	Lincoln	Blackfoot Tailings	25-322	12.48
103	Cascade	Neihart	Rebellion Mine (Upper & Lower)	07-157	12.12
104	Cascade	Neihart	Hartley	07-082	11.73
105	Jefferson	Colorado	Argentine	22-102	11.36
106	Madison	Virginia City	U.S. Grant	29-095	10.57
107	Powell	Elliston	Sure Thing	39-020	10.55
108	Jefferson	Cataract	Eva May	22-075	10.19
109	Cascade	Neihart	Broadwater	07-079	10.08
110	Jefferson	Basin	Old Basin Millsite	22-500	9.59
111	Lewis & Clark	Rimint	Woodrow Wilson	25-258	9.58
112	Lewis & Clark	Manyville	Drummond Mine/Mill/Tailings	25-024	9.40
113	Beaverhead	Elkhorn-South	Old Elkhorn	01-189	8.80
114	Granite	Phillipsburg	Queen (Tourmaline)	20-111	8.63
115	Jefferson	Elkhorn	True Fissure	22-111	7.76
116	Judith Basin	Hughesville	Tiger	23-059	7.72
117	Jefferson	Elkhorn	Elkhorn Queen	22-027	7.51
118	Broadwater	Indian Creek	Bullion King	04-081	7.03
119	Lewis & Clark	Manyville	Bald Mountain	25-061	7.00
120	Cascade	Neihart	Evening Star Mine/Millsite	07-087	6.61
121	Madison	Pony	Boss Tweed	29-034	6.13
122	Mineral	Iron Mountain	Dillon Millsite	31-073	6.10
123	Park	New World	Black Warrior	34-079	6.05
124	Jefferson	High Ore	Grey Eagle	22-029	6.03
125	Jefferson	Cataract	Boulder Chief	22-132	5.93
126	Granite	Antelope Creek	Silver King	20-188	5.50
127	Granite	Phillipsburg	Little Gem	20-071	5.44
128	Broadwater	Indian Creek	St. Louis	04-013	5.34
129	Lewis & Clark	Rimint	Beatrice	25-103	5.29
130	Park	New World	McLaren Tailings	34-004	5.26
131	Broadwater	Radersburg	Keating Tailings	04-121	5.21
132	Jefferson	Cataract	Crescent/Alsace	22-106	4.82
133	Park	New World	Lower Glengarry	34-006	4.82
134	Park	New World	McLaren Mine	34-010	4.78
135	Cascade	Neihart	Big Seven	07-156	4.45
136	Mineral	Iron Mountain	Iron Mountain Millsite	31-010	4.13
137	Jefferson	Basin	Basin Millsite	22-036	4.12
138	Madison	Pony	Strawberry	29-038	4.09
139	Madison	Sheridan	Lakeshore	29-436	4.06

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	AIMSS SCORE
140	Beaverhead	Hedra	True Blue	01-138	4.04
141	Fergus	Warm Springs	Git Edge Tailings	14-008	4.03
142	Broadwater	Winston	Charlam	04-501	3.94
143	Powell	Elliston	Julia	39-022	3.88
144	Cascade	Neihart	Silver Belt	07-111	3.83
145	Jefferson	Cataract	Rockier/Ada	22-170	3.79
146	Broadwater	Winston	Golden Age	04-050	3.78
147	Beaverhead	Bannack	Apex Millsite	01-006	3.75
148	Lewis & Clark	Stemple	Swansea Tailings/Mine	25-208	3.67
149	Jefferson	Alhambra	Alhambra Hot Springs	22-049	3.59
150	Cascade	Neihart	Molton	07-084	3.32
151	Fergus	Warm Springs	Prestier John	14-090	3.05
152	Cascade	Neihart	Fairplay	07-112	2.76
153	Mesagher	Smith River	SW NE S10	30-078	2.70
154	Sanders	White Pine	Jack Waite	45-002	2.69
155	Broadwater	Radersburg	Ohio	04-009	2.64
156	Powell	Elliston	Anna R./Hattie M.	39-044	2.58
157	Judith Basin	Hughesville	Danny T	23-500	2.48
158	Jefferson	Elkhorn	Sourdough	22-336	2.30
159	Madison	Sheridan	Latest Out	29-354	2.18
160	Cascade	Hughesville	Bon Ton	07-094	2.13
161	Jefferson	Basin	Lady Leith	22-316	2.13
162	Mineral	Keystone	Nancy Lee Mine	31-001	2.11
163	Jefferson	Cataract	Morning Glory	22-077	2.10
164	Jefferson	Colorado	Crawley Camp	22-028	2.03
165	Missoula	Elk Creek	Morse & Kennedy	32-033	2.03
166	Lewis & Clark	Stemple	Astor	25-227	2.02
167	Madison	Sheridan	Uncle Sam	29-383	2.02
168	Silver Bow	Elk Park	Rising Sun	47-037	2.02
169	Missoula	Clinton	Wallace Creek Millsite	32-019	1.96
170	Silver Bow	Moose Creek	Middle Fork Millsite	47-081	1.96
171	Jefferson	Alhambra	Solar Silver	22-054	1.90
172	Beaverhead	Birch Creek	Indian Queen	01-034	1.87
173	Madison	Sheridan	NE SE S28	29-476	1.81
174	Cascade	Neihart	Rochester	07-110	1.74
175	Madison	Virginia City	Easton	29-121	1.72
176	Missoula	Ninemile	Lost Cabin	32-011	1.55
177	Broadwater	Winston	Custer Millsite	04-006	1.51
178	Powell	Elliston	Golden Anchor	39-012	1.51
179	Mineral	Iron Mountain	Belle of the Hills	31-072	1.50
180	Judith Basin	Hughesville	Marcelline	23-022	1.48
181	Judith Basin	Hughesville	Belt Patent	23-035	1.47
182	Beaverhead	Hedra	Trapper	01-144	1.40
183	Granite	Moose Lake	Banner	20-175	1.39
184	Lewis & Clark	Rimint	Peter	25-259	1.39

TABLE 4-1: ABANDONED HARDROCK MINE PRIORITY SITES AIMSS RANKING (Cont'd)

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	AIMSS SCORE
185	Lewis & Clark	Lincoln	Seven-Up Peter/Rover	25-020	1.26
186	Jefferson	Basin	Jack Creek Tailings	22-296	1.22
187	Mineral	Keystone	Little Anaconda	31-077	1.22
188	Powell	Elliston	Mountain View	39-062	1.16
189	Madison	Sheridan	Goldschmidt-Stelner	29-078	1.15
190	Cascade	Nehart	Ripple Mines	07-163	1.14
191	Jefferson	Clancy	General Grant	22-245	1.14
192	Jefferson	Elkhorn	Tacoma	22-284	1.11
193	Cascade	Nehart	Compromise	07-100	1.05
194	Madison	Tidal Wave	B&H	29-083	1.03
195	Judith Basin	Hughesville	Moulton	23-058	1.00
196	Mineral	Packer Creek	Tarbox-Mineral King	31-003	1.00
197	Granite	Frog Pond	Millers Mine	20-176	0.97
198	Park	New World	Fisher Creek No. 1	34-090	0.97
199	Madison	Pony	Atlantic & Pacific	29-033	0.91
200	Lewis & Clark	Marysville	Wildcat	25-317	0.88
201	Missoula	Ninemile	Nugget	32-042	0.88
202	Lewis & Clark	Rimint	Monitor Creek Tailings	25-503	0.85
203	Cascade	Nehart	Lexington No. 4	07-167	0.83
204	Stillwater	Stillwater	Benbow Millsite	48-005	0.82
205	Jefferson	Basin	Doris	22-293	0.79
206	Granite	Alps	Argo	20-081	0.77
207	Jefferson	Basin	Perry's Park	22-039	0.76
208	Deer Lodge	Silver Lake	Silver Lake Millsite	12-070	0.74
209	Powell	Elliston	Kimball	39-018	0.74
210	Broadwater	Confederate	Miller Mountain	04-138	0.73
211	Powell	Elliston	Monarch	39-008	0.70
212	Cascade	Nehart	Stallabrass	07-120	0.66
213	Park	New World	Little Daisy	34-009	0.66
214	Cascade	Nehart	Emma	07-144	0.63
215	Granite	Philipsburg	Rumsey Mine/Millsite	20-018	0.63
216	Sweet Grass	Independence	Yager/Daisy	49-002	0.61
217	Madison	Sheridan	Broadgauge	29-293	0.60
218	Judith Basin	Hughesville	NE NE S7 (Lucky Strike)	23-042	0.56
219	Lewis & Clark	Stemple	SE SW S10	25-212	0.53
220	Jefferson	Elkhorn	Trumley Heap Leach	22-501	0.52
221	Park	New World	Gold Dust	34-007	0.52
222	Missoula	Copper Cliff	Copper Cliff	32-001	0.49
223	Beaverhead	Wisdom	Clara	01-282	0.46
224	Granite	Dunkleburg	Jackson Park	20-027	0.46
225	Madison	Virginia City	Kearseage	29-102	0.45
226	Jefferson	Colorado	Wickes Smelter	22-358	0.44
227	Madison	Virginia City	Bella	29-098	0.42
228	Missoula	Ninemile	Joe Wallit	32-010	0.42
229	Cascade	Nehart	Maud S.	07-129	0.41
230	Sanders	Trout Creek	Holiday (Silver Mark)	45-009	0.41
231	Mineral	Packer Creek	Saltate Consolidate	31-021	0.39
232	Beaverhead	Wisdom	Marlin	01-270	0.38
233	Missoula	Copper Cliff	Frogs Diner	32-027	0.37
234	Park	Emigrant	Alison	34-018	0.37
235	Granite	Antelope Creek	Ant	20-194	0.36
236	Lewis & Clark	Rimini	Bear Gulch	25-504	0.35
237	Madison	Sheridan	Smuggler	29-010	0.35
238	Powell	Elliston	Hard Luck	39-014	0.32
239	Silver Bow	Melrose	Clipper	47-029	0.32
240	Jefferson	Cataract	Manite (East)	22-032	0.29
241	Fergus	Warm Springs	Cumberland	14-017	0.27
242	Granite	Garnet	Free Coin/Red Cloud	20-134	0.27
243	Madison	Tidal Wave	Dry Gulch South	29-282	0.27
244	Madison	Norris/Red Bluff	Grubstake	29-399	0.25
245	Lewis & Clark	Stemple	Jay Gould Mine/Millsite	25-500	0.23
246	Broadwater	Hellgate	Argo Mine/Millsite	04-015	0.22
247	Deer Lodge	Orofino	Champion	12-003	0.22
248	Lewis & Clark	Marysville	Belmont	25-187	0.22
249	Granite	Dunkleburg	Wasa	20-023	0.20
250	Granite	Alps	Alps	20-065	0.20
251	Fergus	Warm Springs	Tail Hot	14-010	0.16
252	Cascade	Nehart	Sherman No. 2 - SW	07-142	0.15
253	Silver Bow	Melrose	Old Glory	47-027	0.15
254	Lewis & Clark	Marysville	Big Ox Mine	25-116	0.14
255	Revali	Pleasant View	Blue Bird	41-009	0.14
256	Jefferson	Elkhorn	Iron	22-359	0.13
257	Madison	Sheridan	Red Pine	29-079	0.13
258	Madison	Washington	SE SE S25	29-394	0.13
259	Powell	Elliston	Telegraph	39-023	0.12
260	Lewis & Clark	Orpith	Victory/Evening Star	25-010	0.11
261	Madison	Virginia City	Apex	29-105	0.11
262	Meagher	Beaver Creek	Bigler	30-067	0.09
263	Park	New World	Upper Alice E.	34-085	0.09
264	Revali	Frog Pond	Montana Prince	41-004	0.09
265	Broadwater	Indian Creek	Diamond Hill	04-020	0.08
266	Meagher	Castle Mountain	Belle of the Castle	30-007	0.07
267	Granite	Moose Lake	Old Dominion	20-180	0.06
268	Powell	Elliston	Third Term	39-024	0.06
269	Beaverhead	Heda	Silver King	01-094	0.05
270	Beaverhead	Lemhi Pass	Last Chance No. 1/IER	01-216	0.05
271	Cascade	Nehart	Vilpa	07-080	0.05
272	Granite	Antelope Creek	Lort No. 13	20-191	0.05
273	Sanders	Plains	Lower Letterman	45-047	0.05
NR	Deer Lodge	Silver Lake	Cable	12-002	0.00
NR	Madison	Rochester	Watsoa	29-075	0.00
NR	Madison	Pony	Chicago Mining Corp. Pony Mill	29-500	0.00

TABLE 4-2: ABANDONED HARDROCK MINE PRIORITY SITES SAFETY RANKING

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SCORE
1	Lewis & Clark	Scratchgravel	Franklin	25-339	30330.00
2	Granite	Philpsburg	Trout	20-062	6196.50
3	Granite	Philpsburg	Wenger No. 2	20-073	1152.00
4	Madison	Virginia City	Prospect	29-136	1102.50
5	Jefferson	Colorado	Alta	22-001	1070.80
6	Granite	Philpsburg	Little Gem	20-071	1054.00
7	Broadwater	Indian Creek	Park (Marietta)	04-012	940.80
8	Jefferson	High Ore	Cornet Tailings	22-009	918.53
9	Lewis & Clark	Ophir	Victory/Evening Star	25-010	910.00
10	Lewis & Clark	Marysville	Bald Mountain	25-061	848.00
11	Jefferson	Cataract	Morning Glory	22-077	756.40
12	Granite	Philpsburg	Algonquin	20-005	731.00
13	Granite	Philpsburg	True Fissure	20-111	714.00
14	Sweet Grass	Independence	Yager/Daisy	49-002	710.00
15	Meagher	Castle Mountain	Cumberland	30-004	630.00
16	Madison	Silver Star	Broadway/Victoria	29-179	627.50
17	Lewis & Clark	Marysville	Drummon Mine/Mill/Tailings	25-024	590.00
18	Madison	Virginia City	U.S. Grant	29-095	566.50
19	Park	New World	Lower Glengary	34-008	560.00
20	Judith Basin	Hughesville	Marcelline	23-022	555.00
21	Cascade	Nehalem	Compromise	07-100	522.00
22	Madison	Sheridan	Buckeye	29-451	490.00
23	Broadwater	Radersburg	Ohio	04-009	470.00
24	Lewis & Clark	Rimini	Red Water	25-007	462.00
25	Madison	Pony	Strawberry	29-038	454.00
26	Jefferson	High Ore	Grey Eagle	22-029	440.00
27	Cascade	Nehalem	Vilpa	07-080	436.80
28	Jefferson	Elkhorn	Carmody	22-337	435.00
29	Jefferson	Basin	Bullion	22-008	425.00
30	Cascade	Nehalem	Queen of the Hills	07-085	405.00
31	Granite	South Boulder	Brooklyn	20-025	405.00
32	Granite	Philpsburg	Douglas Creek Tailings	20-003	404.00
33	Beaverhead	Hedra	Upper & Lower Cleve	01-143	390.00
34	Beaverhead	Ermon	Ermon Mines/Millsite	01-005	382.50
35	Granite	Philpsburg	Scratch All	20-019	364.65
36	Granite	Garnet	Free Coin/Red Cloud	20-134	325.50
37	Sanders	Plains	Lower Letterman	45-047	325.00
38	Jefferson	Ahambra	Alhambra Hot Springs	22-049	315.00
39	Granite	Moose Lake	Banner	20-175	310.50
40	Judith Basin	Hughesville	Block P Mine	23-001	308.00
41	Jefferson	Colorado	Corbin Flats	22-004	307.50
42	Deer Lodge	Orofino	Champion	12-003	280.00
43	Park	New World	Gold Dust	34-007	280.00
44	Cascade	Nehalem	Rochester	07-110	262.50
45	Broadwater	Helgate	Argo Mine/Millsite	04-015	260.00
46	Cascade	Nehalem	Motton	07-084	260.00
47	Jefferson	Basin	Old Basin Millsite	22-500	256.00

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SCORE
48	Beaverhead	Wisdom	Martin	01-270	240.00
49	Beaverhead	Hedra	True Blue	01-138	236.00
50	Granite	South Boulder	Nonparel	20-012	235.00
51	Lewis & Clark	Marysville	Big Ox Millsite	25-115	224.40
52	Granite	Philpsburg	Granite Mountain	20-110	215.00
53	Powell	Elision	Golden Anchor	39-012	212.80
54	Beaverhead	Blrch Creek	Indian Queen	01-034	210.00
55	Madison	South Boulder	Mammoth Tailings	29-082	202.50
56	Powell	Emery	Emery	39-004	200.00
57	Cascade	Nehalem	Evening Star Mine/Millsite	07-087	196.00
58	Lewis & Clark	Rimini	Beatrice	25-103	193.80
59	Broadwater	Confederate	Miller Mountain	04-138	190.00
60	Madison	Tidal Wave	Dry Gulch South	29-282	190.00
61	Granite	Dunkleburg	Forest Rose	20-004	186.00
62	Broadwater	Indian Creek	Diamond Hill	04-020	161.25
63	Lewis & Clark	Rimini	Armstrong	25-102	152.50
64	Park	New World	McLaren Mine	34-010	151.50
65	Ravalli	Culwau	Culwau	41-003	148.50
66	Cascade	Nehalem	Decotah	07-121	147.00
67	Granite	Moose Lake	Old Dominion	20-180	144.00
68	Jefferson	Colorado	Argentine	22-102	140.00
69	Madison	Rochester	Thistle Mine/Millsite	29-073	140.00
70	Powell	Elision	Lily/Orphan Boy	39-006	140.00
71	Lewis & Clark	Marysville	Belmont	25-167	136.50
72	Beaverhead	Elkhorn-South	Old Elkhorn	01-169	130.00
73	Stillwater	Stillwater	Benbow Millsite	48-005	125.00
74	Madison	Rochester	Watseca	29-075	121.80
75	Jefferson	Elkhorn	Iron	22-359	118.50
76	Lewis & Clark	Helena	Spring Hill Tailings	25-067	115.00
77	Fergus	Warm Springs	Cumberland	14-017	113.75
78	Madison	Washington	Missouri	29-373	112.50
79	Madison	Sheridan	Goldschmidt-Stehner	29-078	112.00
80	Broadwater	Winston	Sunrise/January	04-130	108.90
81	Gallatin	Bozeman	Karst Asbestos	16-018	108.00
82	Jefferson	Clancy	Nellie Grant	22-244	108.00
83	Cascade	Nehalem	Broadwater	07-079	104.00
84	Meagher	Beaver Creek	Bigler	30-067	102.00
85	Madison	Sheridan	Smuggler	29-010	101.00
86	Silver Bow	Basin Creek	Highland Mine	47-028	100.00
87	Cascade	Nehalem	Silver Belt	07-111	98.00
88	Cascade	Nehalem	Emma	07-144	94.60
89	Madison	Virginia City	Belle	29-098	92.80
90	Granite	Philpsburg	Rumsey Mine/Millsite	20-018	91.80
91	Lewis & Clark	Rimini	Red Mountain (13)	25-019	91.00
92	Beaverhead	Bannack	Apex Millsite	01-006	90.90
93	Granite	Maxville	Maxville Tailings (Londonderry)	20-209	88.80
94	Jefferson	Alhambra	Middle Fork Warm Springs	22-046	86.70

TABLE 4-2: ABANDONED HARDROCK MINE PRIORITY SITES SAFETY RANKING (Cont'd)

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SAFETY SCORE
95	Madison	Pony	Garnet Gold Mine	29-035	85.00
96	Silver Bow	Elk Park	Rising Sun	47-037	85.00
97	Lewis & Clark	Manyville	Bald Butte Mllsite	25-179	80.00
98	Jefferson	Elkhorn	Tacomia	22-284	77.00
99	Powell	Elliston	Sure Thing	39-020	76.50
100	Lewis & Clark	Stemple	NE NW S13	25-197	75.00
101	Missoula	Ninemile	Joe Wallit	32-010	75.00
102	Cascade	Neihart	Harley	07-082	72.00
103	Cascade	Neihart	Silver Dyke Mllsite	07-138	70.40
104	Deer Lodge	Silver Lake	Silver Lake Mllsite	12-070	82.00
105	Jefferson	Elkhorn	Elkhorn Queen	22-027	81.00
106	Park	New World	Upper Alice E.	34-085	80.00
107	Jefferson	Cataract	Crescent/Alisac	22-108	59.40
108	Lewis & Clark	Manyville	Empire Mllsite	25-175	58.80
109	Judith Basin	Hughesville	NE NE S7 (Lucky Strike)	23-042	56.00
110	Jefferson	Colorado	Crawley Camp	22-028	55.20
111	Madison	Sheridan	Broadgauge	29-293	55.00
112	Sanders	Plains	Montro Gold	45-010	55.00
113	Mineral	Keystone	Nancy Lee Mllsite - Slowey	31-090	54.60
114	Missoula	Ninemile	Nugget	32-042	53.00
115	Jefferson	Basin	Doris	22-293	51.80
116	Madison	Pony	Boss Tweed	29-034	51.50
117	Granite	Frog Pond	Millers Mine	20-178	50.40
118	Jefferson	Colorado	Washington	22-007	50.40
119	Lewis & Clark	Manyville	Goldail Mllsite	25-365	48.45
120	Ravalli	Pleasant View	Blue Bird	41-009	48.13
121	Beaverhead	Bannack	Gold Leaf/Priscilla	01-031	46.00
122	Cascade	Neihart	Silver Dyke Tailings	07-137	45.00
123	Powell	Elliston	Kimball	39-018	44.80
124	Madison	Pony	Atlantic & Pacific	29-033	41.80
125	Lewis & Clark	Manyville	Piegan/Gloster Mllsite	25-172	40.80
126	Jefferson	Elkhorn	Sourdough	22-336	40.50
127	Fergus	Warm Springs	Prestier John	14-090	40.00
128	Madison	South Boulder	Mammoth	29-008	40.00
129	Lewis & Clark	Rimmi	Monte Cristo	25-275	38.50
130	Fergus	Warm Springs	Tail Hot	14-010	38.00
131	Powell	Elliston	Hard Luck	39-014	38.00
132	Cascade	Neihart	Silver Dyke Adit	07-135	37.50
133	Beaverhead	Lost Creek	Tungsten Mllsite	01-170	35.00
134	Lewis & Clark	Rimmi	Tennile Mine	25-005	35.00
135	Missoula	Clinton	Wallace Creek Mllsite	32-019	35.00
136	Jefferson	Cataract	Eva May	22-075	33.80
137	Broadwater	Winston	East Pacific	04-008	33.55
138	Madison	Sheridan	SE SW S26 (Keynote)	29-474	33.00
139	Jefferson	Colorado	Wickes Smelter	22-358	32.00

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SAFETY SCORE
140	Granite	Antelope Creek	Silver King	20-186	31.20
141	Powell	Elliston	Monarch	39-008	30.25
142	Cascade	Neihart	Maud S.	07-129	30.00
143	Judith Basin	Hughesville	Danny T	23-500	30.00
144	Lincoln	Libby	Snowshoe	27-005	30.00
145	Madison	Virginia City	Kearsage	29-102	30.00
146	Park	New World	Fisher Creek No. 1	34-090	30.00
147	Silver Bow	Elk Park	Mary Emmee/Clinton	47-035	30.00
148	Cascade	Neihart	Sherman No. 2 - SW	07-142	28.80
149	Deer Lodge	Silver Lake	Gold Coin	12-004	28.50
150	Meagher	Smith River	SW NE S10	30-078	28.05
151	Lewis & Clark	Rimmi	Upper Valley Forge	25-280/282	27.50
152	Missoula	Crammer Creek	Linton	32-017	27.20
153	Broadwater	Indian Creek	Bullion King	04-081	27.00
154	Jefferson	Basin	Lady Leth	22-318	26.00
155	Broadwater	Winston	Kleinschmidt	04-010	23.50
156	Lewis & Clark	Stemple	Swansea Tailings/Mine	25-208	23.10
157	Cascade	Neihart	Ripple Mines	07-163	23.00
158	Lewis & Clark	Rimmi	Woodrow Wilson	25-258	22.80
159	Madison	Norris/Red Bluff	Boaz	29-013	21.00
160	Jefferson	Cataract	Boulder Chief	22-132	20.25
161	Jefferson	Elkhorn	Elkhorn Creek Tailings	22-502	20.00
162	Madison	Norris/Red Bluff	Grubstake	29-399	20.00
163	Fergus	Warm Springs	Gilt Edge Tailings	14-008	19.20
164	Judith Basin	Hughesville	Harrison/Moulton	23-056	19.00
165	Cascade	Neihart	Stallabass	07-120	18.00
166	Lewis & Clark	Rimmi	Peerless Jenny/King	25-008	17.60
167	Lewis & Clark	Rimmi	National Extension	25-287	16.50
168	Powell	Elliston	Telegraph	39-023	15.50
169	Missoula	Copper Cliff	Copper Cliff	32-001	13.80
170	Lewis & Clark	Lincoln	Blackfoot Tailings	25-322	12.00
171	Judith Basin	Hughesville	Edwards Lode	23-046	10.00
172	Powell	Elliston	Mountain View	39-062	10.00
173	Sanders	White Pine	Jack Waite	45-002	10.00
174	Broadwater	Indian Creek	St. Louis	04-013	8.85
175	Lewis & Clark	Lincoln	Seven-Up Peter/Rover	25-020	8.70
176	Broadwater	Winston	Custer Mllsite	04-006	8.25
177	Beaverhead	Heda	Trapper	01-144	8.00
178	Silver Bow	Moose Creek	Middle Fork Mllsite	47-081	8.00
179	Missoula	Woodman	Ward Lode	32-005	7.50
180	Powell	Elliston	Charter Oak	39-003	7.50
181	Broadwater	Winston	Golden Age	04-050	7.30
182	Granite	Alps	Alps	20-085	7.20
183	Powell	Elliston	Julia	39-022	8.50
184	Missoula	Ninemile	Lost Cabin	32-011	8.40

TABLE 4-2: ABANDONED HARDROCK MINE PRIORITY SITES SAFETY RANKING (Cont'd)

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SAFETY SCORE
185	Madison	Virginia City	Apex	29-105	5.00
186	Meagher	Castle Mountain	Belle of the Castle	30-007	5.00
187	Madison	Virginia City	Pacific	29-118	4.50
188	Cascade	Neihart	Ledington No. 4	07-167	4.00
189	Jefferson	Cataract	Rocker/Ada	22-170	3.60
190	Powell	Elision	Anna R. Hattie M.	39-044	3.60
191	Lewis & Clark	Stemple	Jay Gould Mine/Millsite	25-500	3.10
192	Missoula	Elk Creek	Morse & Kennedy	32-033	3.00
193	Ravalli	Frog Pond	Montana Prince	41-004	3.00
194	Madison	Sheridan	Red Pine	29-079	2.80
195	Broadwater	Winston	Charlam	04-501	2.65
196	Jefferson	Basin	Josephine	22-031	2.55
197	Granite	Dunkleburg	Wasa	20-023	2.50
198	Lewis & Clark	Rimmi	Queensbury	25-262	2.40
199	Granite	Alps	Argo	20-081	1.00
200	Cascade	Hughesville	Bon Ton	07-094	0.80
201	Cascade	Neihart	Rebellion Mine (Upper & Lower)	07-157	0.80
202	Lewis & Clark	Stemple	Astor	25-227	0.80
203	Judith Basin	Hughesville	Tiger	23-059	0.75
204	Lewis & Clark	Rimmi	Monitor Creek Tailings	25-503	0.75
205	Jefferson	Colorado	Bertha	22-002	0.60
206	Jefferson	Alhambra	Solar Silver	22-054	0.50
207	Mineral	Keystone	Nancy Lee Mine	31-001	0.50
208	Judith Basin	Hughesville	Moulton	23-058	0.45
209	Beaverhead	Hedra	Silver King	01-084	0.00
210	Beaverhead	Lemhi Pass	Last Chance No. 1/IER	01-216	0.00
211	Beaverhead	Wisdom	Clara	01-282	0.00
212	Broadwater	Winston	Vosburg	04-014	0.00
213	Broadwater	Radersburg	Keating Tailings	04-121	0.00
214	Cascade	Hughesville	Block P Tailings	07-090	0.00
215	Cascade	Neihart	Carpenter Creek Tailings	07-103	0.00
216	Cascade	Neihart	Fairplay	07-112	0.00
217	Cascade	Neihart	Neihart Tailings	07-134	0.00
218	Cascade	Neihart	Big Seven	07-156	0.00
219	Deer Lodge	Silver Lake	Cable	12-002	0.00
220	Flathead	Hog Heaven	Flathead Mine	15-012	0.00
221	Granite	Phillipsburg	BI-Metallic/Old Red	20-002	0.00
222	Granite	Combination	Combination Millsite	20-009	0.00
223	Granite	Dunkleburg	Jackson Park	20-027	0.00
224	Granite	Antelope Creek	Lot No. 13	20-191	0.00
225	Granite	Antelope Creek	Ant	20-194	0.00
226	Jefferson	Colorado	Bluebird	22-003	0.00
227	Jefferson	Colorado	Gregory	22-005	0.00
228	Jefferson	Cataract	Mantle (East)	22-032	0.00
229	Jefferson	Basin	Basin Millsite	22-036	0.00
230	Jefferson	Basin	Perry's Park	22-039	0.00

SAFETY RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	SAFETY SCORE
231	Jefferson	Basin	Buckeye	22-072	0.00
232	Jefferson	Cataract	Crystal	22-073	0.00
233	Jefferson	Basin	Enterprise	22-074	0.00
234	Jefferson	Elkhorn	Queen (Tourmaline)	22-111	0.00
235	Jefferson	Clancy	General Grant	22-245	0.00
236	Jefferson	Basin	Jack Creek Tailings	22-296	0.00
237	Jefferson	Elkhorn	Trumley Heap Leach	22-501	0.00
238	Judith Basin	Hughesville	Belt Patent	23-035	0.00
239	Judith Basin	Hughesville	Wright Lode	23-045	0.00
240	Lewis & Clark	Rimmi	Valley Forge/Susie	25-008	0.00
241	Lewis & Clark	Rimmi	Lower Tenmile Millsite	25-030	0.00
242	Lewis & Clark	Marysville	Big Ox Mine	25-116	0.00
243	Lewis & Clark	Stemple	SE SW S10	25-212	0.00
244	Lewis & Clark	Rimmi	Peter	25-259	0.00
245	Lewis & Clark	Marysville	Wildcat	25-317	0.00
246	Lewis & Clark	Helena	Joslyn Street Tailings	25-501	0.00
247	Lewis & Clark	Rimmi	Bear Gulch	25-504	0.00
248	Lincoln	Libby	Cherry Creek Millsite	27-006	0.00
249	Madison	Rochester	Emma	29-081	0.00
250	Madison	Tidal Wave	B&H	29-083	0.00
251	Madison	Virginia City	Easton	29-121	0.00
252	Madison	Sheridan	Latest Out	29-354	0.00
253	Madison	Sheridan	Uncle Sam	29-383	0.00
254	Madison	Washington	SE SE S25	29-394	0.00
255	Madison	Sheridan	Lakeshore	29-438	0.00
256	Madison	Sheridan	NW SE S28	29-476	0.00
257	Madison	Pony	Chicago Mining Corp. Pony Mill	29-500	0.00
258	Mineral	Packer Creek	Tarbox-Mineral King	31-003	0.00
259	Mineral	Iron Mountain	Iron Mountain Millsite	31-010	0.00
260	Mineral	Packer Creek	Saltate Consolidate	31-021	0.00
261	Mineral	Iron Mountain	Belle of the Hills	31-072	0.00
262	Mineral	Iron Mountain	Dillon Millsite	31-073	0.00
263	Mineral	Keystone	Little Anaconda	31-077	0.00
264	Mineral	Keystone	Nancy Lee Millsite	31-082	0.00
265	Missoula	Copper Cliff	Frogs Diner	32-027	0.00
266	Park	New World	Great Republic Smelter	34-000	0.00
267	Park	New World	McLaren Tailings	34-004	0.00
268	Park	New World	Little Daisy	34-009	0.00
269	Park	Emigrant	Allison	34-018	0.00
270	Park	New World	Black Warrior	34-079	0.00
271	Powell	Elliston	Ontario Millsite	39-010	0.00
272	Powell	Elliston	Third Term	39-024	0.00
273	Sanders	Blue Creek	Broken Hill	45-005	0.00
274	Sanders	Trout Creek	Holiday (Silver Mark)	45-009	0.00
275	Silver Bow	Melrose	Old Glory	47-027	0.00
276	Silver Bow	Melrose	Copper	47-029	0.00

TABLE 4-3: ABANDONED HARDROCK MINE DROPPED PRIORITY SITES

AIMSS RANK	COUNTY	DISTRICT	SITE NAME	P.A. NO.	AIMSS SCORE	SAFETY SCORE
274	Cascade	Neihart	Baker	07-180	0.04	12.00
275	Mineral	Keystone	Keystone	31-074	0.04	51.00
276	Mineral	Keystone	Hopkins	31-078	0.04	30.80
277	Broadwater	Confederate	Hummingbird	04-144	0.03	0.00
278	Gallatin	Bozeman	Elk Creek Corundum	16-013	0.03	15.40
279	Lewis & Clark	Stemple	New Jay Gould Millsite	25-502	0.03	44.00
280	Madison	Virginia City	General Shafter	29-103	0.03	0.00
281	Powell	Elliston	Viking	39-077	0.03	1.25
282	Stillwater	Nye	Mouat	48-001	0.03	30.25
283	Beaverhead	Lemhi Pass	Last Chance No. 2	01-220	0.02	0.00
284	Cascade	Neihart	Snow Creek Millsite	07-505	0.02	1.60
285	Madison	Norwegian	Norwegian	29-006	0.02	4.80
286	Missoula	Woodman	Upper Triantler	32-048	0.02	102.00
287	Beaverhead	Lemhi Pass	South Frying Pan Creek	01-211	0.01	0.00
288	Cascade	Neihart	Hutchinson	07-177	0.01	0.00
289	Jefferson	Basin	Marguerite	22-301	0.01	10.00
290	Lewis & Clark	Stemple	Pangewasset	25-226	0.01	1.25
291	Madison	Tidal Wave	Eleanor Mines (East)	29-285	0.01	0.00
292	Madison	Tidal Wave	Pete & Joe	29-449	0.01	0.00
293	Meagher	Beaver Creek	Lane	30-019	0.01	0.00
294	Mineral	Cedar Creek	Cajun Queen No. 1	31-049	0.01	0.00
295	Missoula	Ninemile	Hautilla	32-057	0.01	20.40
296	Sanders	Plains	Dee Creek	45-041	0.01	50.00
297	Lincoln	Libby	Mitchell Creek	27-055	0.0045	20.00
298	Meagher	Beaver Creek	Porcupine	30-069	0.0040	53.00
299	Cascade	Neihart	Atlantus	07-113	0.0039	60.00
300	Mineral	Iron Mountain	Gold King	31-067	0.0038	0.00
301	Park	New World	Homestake No. 2	34-093	0.0036	410.00
302	Madison	Sheridan	Pedro	29-455	0.0035	0.00
303	Powell	Orphir	NE NW S32	39-052	0.0031	175.00
304	Judith Basin	Yogo	NE NE S31	23-079	0.0030	0.00
305	Lewis & Clark	Helena	Lady Luck	25-073	0.0023	50.00
306	Fergus	Warm Springs	Western Mine/Millsite	14-030	0.0018	36.00
307	Meagher	Beaver Creek	SE NW S24	30-017	0.0018	132.00
308	Madison	Tidal Wave	Ohio	29-473	0.0015	0.00
309	Ravalli	Hughes Creek	Lucky Joe	41-027	0.0010	43.75
310	Mineral	St. Regis	Gold Chrome	31-037	0.0007	0.00
311	Sweet Grass	Independence	Poorman/Emma	49-001	0.0005	36.00
312	Lewis & Clark	Helena	Davis Gulch II	25-040	0.0005	65.00
313	Beaverhead	Lemhi	Thorium City	01-500	0.0003	0.00
314	Beaverhead	Baldy Mountain	Garrett Hill	01-092	0.0002	0.00
315	Madison	Virginia City	JTC	29-106	0.0002	2.50
316	Judith Basin	Yogo	Vortex	23-027	0.0002	0.00
317	Sweet Grass	Independence	NW SE S22	49-003	0.0002	0.00
318	Missoula	Woodman	Mill Creek	32-049	0.00004	2.50
NR	Broadwater	Winston	Aurora Millsite	04-500	0.00	0.00
NR	Cascade	Neihart	Sherman No. 2 (Northeast)	07-140	0.00	6.00
NR	Gallatin	Bozeman	Thumper Mica	16-015	0.00	200.00
NR	Jefferson	Colorado	Minah	22-104	0.00	0.00
NR	Judith Basin	Yogo	Roncor Amax Sapphire	23-501	0.00	0.00
NR	Lewis & Clark	Rimini	SE SE S13	25-294	0.00	0.00
NR	Lewis & Clark	Marysville	Argo Millsite	25-314	0.00	20.40
NR	Lewis & Clark	Helena	Mother Lode	25-363	0.00	0.00
NR	Lincoln	Libby	Silver Cable	27-066	0.00	0.00
NR	Silver Bow	Melrose	Maiden Rock	47-051	0.00	4.20