PB99-964404
EPA541-R99-072
1999

EPA Superfund
Record of Decision:

California Gulch Site OU 2
Leadville, CO
9/28/1998

CALIFORNIA GULCH SUPERFUND SITE
OPERABLE UNIT 2

DECLARATION FOR THE RECORD OF DECISION FOR SOURCE REMEDIATION AT OPERABLE UNIT 2 - SEPTEMBER 1999

SITE NAME AND LOCATION

CALIFORNIA GULCH NPL SITE ID # 29
CERCLIS ID COD980717938
OPERABLE UNIT-02
LEADVILLE, COLORADO

The California Gulch Superfund Site ("Site") is located in the Leadville, Colorado mining district in Lake County approximately 100 miles southwest of Denver. The California Gulch Site was listed on the National Priorities List on September 8, 1983. The Site is in a mining area covering 16 ½ square miles of a watershed that drains along California Gulch to the Arkansas River.

For ease of performance of remedial activities and administration of the Site as a whole, the Site was divided into twelve Operable Units. These Operable Units ("OUs") are depicted on a map entitled "Operable Units - Areas of Responsibility," which is attached as Exhibit 2. The OUs are as follows:

1. Yak Tunnel/Water Treatment Plant
2. Malta Gulch Tailing Impoundments and Lower Malta Gulch Fluvial Tailings
3. D&RG Slag piles and Railroad Yard/Easement
4. Upper California Gulch
5. Asarco Smelter sites/Slag/Mill sites
6. Starr Ditch/Stray Horse Gulch/Lower Evans Gulch/ Penrose Mine Waste Pile
7. Apache Tailing Impoundments
8. Lower California Gulch
9. Residential and Commercial Populated Areas
10. Oregon Gulch
11. Arkansas River Valley Floodplain
12. Site-wide Water Quality

This Record of Decision selects the remedial action for source remediation at Operable Unit 2 of the Site. Operable Unit 2 includes the Malta Gulch Tailings Impoundments, including Leadville Corporation Mill; the Malta Tailings, including the Leadville Silver & Gold Mill facility; and the fluvial tailings in the area known as the Lower Malta Gulch.

STATEMENT OF BASIS AND PURPOSE

EPA selects "No Further Action" as the appropriate response action for OU 2 of the Site in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); the Superfund Amendments and Reauthorization Act of 1986 (SARA); the National Contingency Plan (NCP); EPA's "Interim Final Guidance on Preparing Superfund Decision Documents," OSWER Directive 9355.3-02 (June 1989); EPA's "Guide to Developing No Action, Interim Action, and Contingency Remedy RODs," OSWER Publication 9355.3-02FS-3 (April 1991); and the Administrative Record for the Site.

DESCRIPTION OF THE SELECTED REMEDY: NO FURTHER ACTION

Four (4) removal/response actions were performed at OU 2. In chronological order, the fluvial tailings were excavated from Lower Malta Gulch and deposited in the Malta Gulch Tailings Impoundment. The material in the Malta Gulch Tailings Impoundment (Leadville Corporation) was consolidated, graded, capped and revegetated. The material in the Malta Tailings Impoundment (Leadville Silver & Gold) was graded, capped and revegetated. Forty-two drums, some very corroded, were removed from the Leadville Corporation Mill and disposed of appropriately.

These removal actions have served to prevent or control the release or threatened release of hazardous substances from the sources of contamination identified in OU 2 such that there are no unacceptable risks to human health and the environment from these sources. Lead is the principal contaminant of concern. However, the response actions performed will control all contaminants of concern contained in the capped material.

This decision document makes no determination on whether surface water or ground water within OU 2 requires remediation. Pursuant to the August 25, 1994 Consent Decree at this Site, it was agreed that the decision on remediation of surface and groundwater site-wide (Operable Unit 12) would be made only after records of decision for source remediation were selected and implemented at each operable unit. This decision document therefore determines that for purposes of source remediation at OU 2 , no additional response actions, either removal or remedial, are necessary beyond the removal actions already performed at the component parts of OU 2. If additional response actions are necessary to meet surface and/or ground water requirements, those actions will be designated in the record of decision for Operable Unit 12. However, groundwater in the area designated as OU 2 is not currently used as a drinking water source.

No further response actions are necessary for the Malta Gulch Tailings Impoundment and Malta Tailings Impoundment portions of OU 2, as long as the present zoning, Industrial Mining, or similar zoning that does not allow residential use is maintained. Procedures will be established to notify EPA of any proposed zoning or land use changes. These procedures, and other measures, will be established in coordination with the other Operable Units where waste is left in place. In addition, the Malta Gulch Tailings Impoundment is presently covered under a permit from the State Department of Minerals and Geology and the no further action decision assumes that uses inconsistent with that permit shall be prevented. The Lower Malta Gulch portion of OU 2 requires no institutional controls.

Periodic monitoring will be conducted at the Malta Gulch Tailings Impoundment and Malta Tailings Impoundment to assure that the response actions conducted remain effective and to assure that the zoning has not changed.

DECLARATION STATEMENT

The Colorado Department of Public Health and Environment has been consulted and does not concur with this "No Further Action" remedy. Our response to the issues raised by the State in their decision not to concur is available in the Record.

I have determined that the "No Further Action ROD" is a remedy that is protective of human health and the environment and is cost effective.

Because this decision will result in hazardous substances remaining on site, above health-based levels, reviews of the previous response actions will be required no less than five years after the initiation of the last response actions. These reviews will also be conducted during site-wide five-year reviews.

The next five-year review is scheduled to be performed not later than February 2001.

9/30/99
Date

Max H. Dodson, Assistant Regional Administrator
Ecosystems Protection and Remediation
U.S. Environmental Protection Agency
Region VIII

RECORD OF DECISION

CALIFORNIA GULCH
OPERABLE UNIT 2

SEPTEMBER 1999

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APPENDICES

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B. RESPONSIVENESS SUMMARY

TABLE

1. REMOVAL ACTIONS PERFORMED 6

DECISION SUMMARY

Site Name and Location

The California Gulch Superfund Site ("Site") was listed on the National Priorities List (NPL) on September 8, 1983. The Site, which is located in Lake County, Colorado occupies 16 ½ square miles of watershed. (Exhibit 1). This watershed drains along California Gulch to the Upper Arkansas River.

The Site includes the City of Leadville, various parts of the Leadville Historic Mining District, and a section of the Arkansas River from the confluence of California Gulch to the confluence of Lake Fork Creek. (Exhibit 2).

The Site is situated in a highly mineralized area of the Colorado Rocky Mountains. Mining, mineral processing, and smelting activities have produced gold, silver, copper, lead, zinc, and manganese for more than 130 years.

California Gulch collects the runoff from numerous abandoned mines and tailings piles with the largest single source of metallic loading coming from the Yak Tunnel. This tunnel was built to drain water from the underground mine workings and to make mineral exploration and development easier. This tunnel drained hundreds of miles of underground mine workings and, prior to the installation and operation of the Yak Tunnel Wastewater Treatment facility, discharged 210 tons yearly of various metals into California Gulch.

The Phase I Remedial Investigation issued in January 1987 determined that surface water in California Gulch contained cadmium and lead exceeding primary drinking water standards. The Phase I RI also determined that Site surface water contained cadmium, copper, lead, and zinc exceeding water quality criteria. Soils, which were highly disturbed in many portions of the Site, were found to contain significant concentrations of arsenic, zinc, lead, copper, and cadmium.

From this report, the main mining-related features that were identified as potentially requiring some removal or remedial response included:

- Acid mine drainage from the Yak Tunnel;
- Seven major tailings impoundments;
- More than two thousand waste rock piles;
- Abandoned mine, milling, and reprocessing operations;

- Smelter wastes, slag and debris; and
- Fluvial tailings.
- Residential Soils

Scope and Role of Operable Unit

For ease of performance of remedial activities and administration of the Site as a whole, the Site was divided into twelve Operable Units. These Operable Units ("OUs") are depicted on a map entitled "Operable Units - Areas of Responsibility," which is attached as Exhibit 2. The OUs are as follows:

1. Yak Tunnel/Water Treatment Plant
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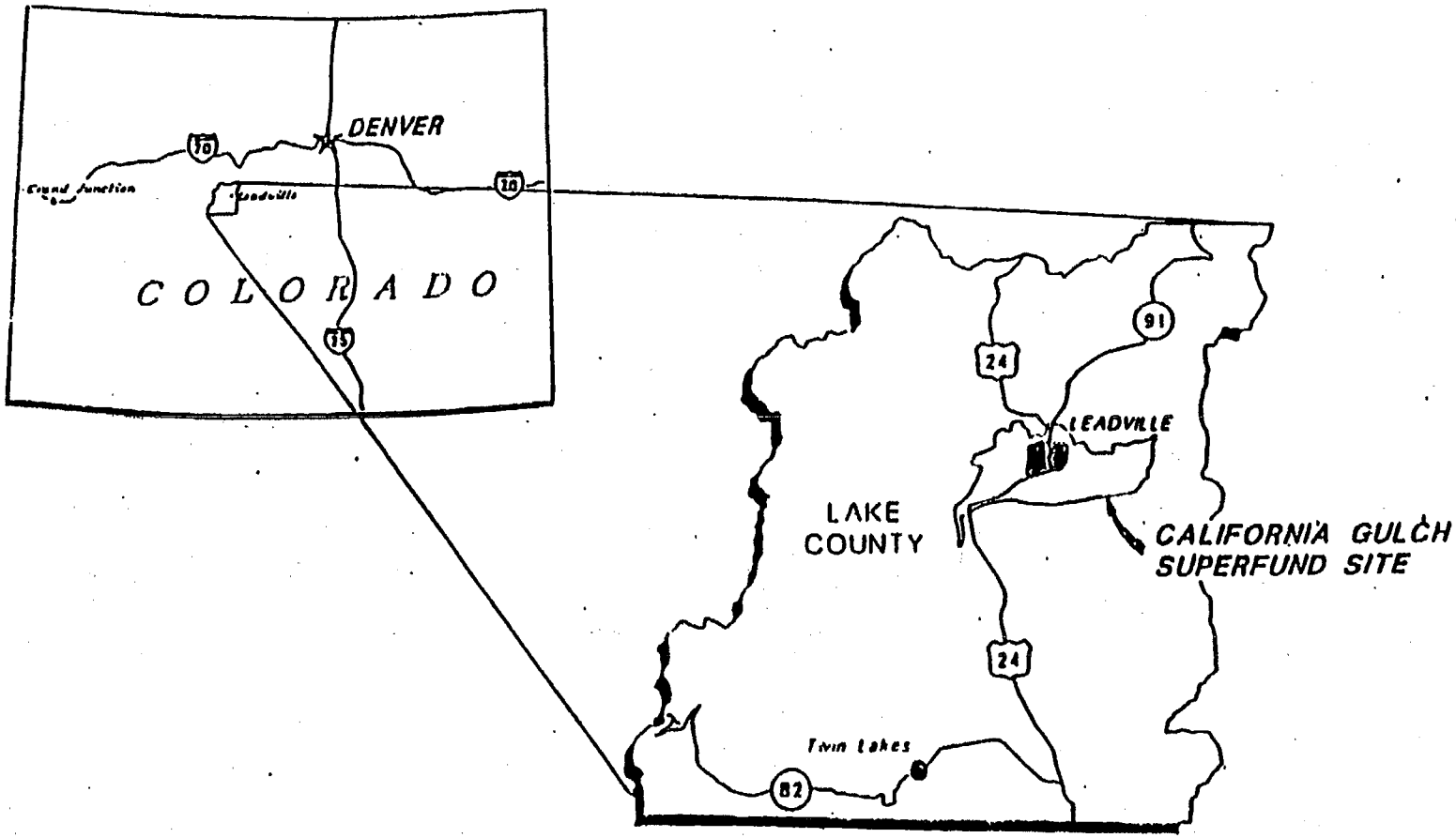
7. Apache Tailing Impoundments
8. Lower California Gulch
9. Residential and Commercial Populated Areas
10. Oregon Gulch
11. Arkansas River Valley Floodplain
12. Site-wide Water Quality

This Record of Decision selects the remedial action for Operable Unit 2 of the Site. Operable Unit 2 includes the Malta Gulch Tailings Impoundments, including Leadville Corporation Mill; the Malta Tailings, including the Leadville Silver & Gold Mill facility; and the fluvial tailings in the area known as the Lower Malta Gulch, specifically Fluvial Site 7. (See map attached as Exhibit 3). Table 1 provides an outline of the background and response actions at each of the locations listed.

Cultural Resources

EPA has conducted a Cultural Resources Survey for each of the removal actions performed within OU 2 of the Site. In consultation with the State Historic Preservation Office (SHPO), it was determined that there were no cultural resources within OU 2 that were considered contributing to the National Historic Landmark District. However, at the request of the Lake County Historic Preservation Advisory Board, the remnants of the Ore & Chemical Mill were preserved. Further information regarding cultural resource concerns is available in

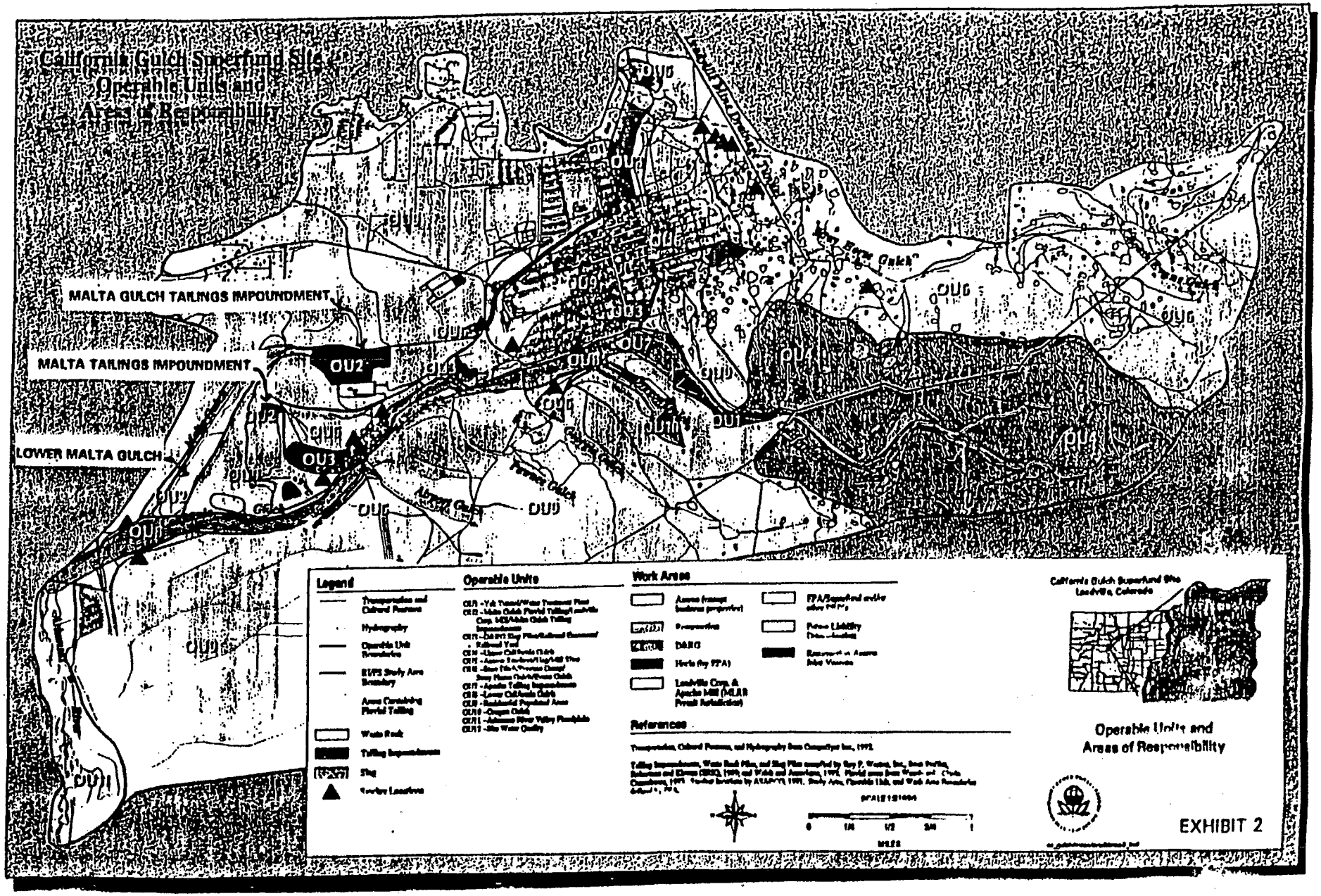
the *Cultural Resources Report, California Gulch Superfund Site, Operable Units 1 thru 12.* The report is dated July 1998 and addressees Removal Actions performed at all Operable Units from July 24, 1994 thru June 30, 1998.



Source: SMI/TerraMatrix, 1998a

EXHIBIT 1

California Gulch Superfund Site General Location Map Leadville, Colorado


California Gulch Superfund Site
Operable Units and
Areas of Responsibility
MALTA GULCH TAILINGS IMPOUNDMENT
MALTA TAILINGS IMPOUNDMENT
LOWER MALTA GULCH
OU1
OU2
OU3
OU4
OU5
OU6
OU7
OU8
OU9
OU10
OU11
Legend
Operable Units
Work Areas
References
California Gulch Superfund Site
Leadville, Colorado
Operable Units and
Areas of Responsibility
EXHIBIT 2

California Gulch Superfund Site
Operable Unit 2
ROD Removals

Malta Gulch Tailings Impoundment
Leadville Corporation Mill

OU6

OU2

OU8

Malta Tailings Impoundment

OU2

OU6

OU3

OU9

OU2

OU9

OU8

Legend

Operable Units

Work Areas

Site Key Map

California Gulch Superfund Site
Leadville, Colorado

References

Operable Unit 2
ROD Removals

EXHIBIT 3

REMOVAL ACTIONS PERFORMED AT CALIFORNIA GULCH OPERABLE UNIT 2

Location	Start/ Complete Dates	Contaminants of Concern [1]	Description of Response Action	Cleanup Standard
Lower Malta Gulch Fluvial Tailing	9/5/95 to 3/17/97	Metals, Sulfate, Cyanide	Fluvial tailing contamination was excavated and hauled to the Malta Gulch Tailing Impoundment for disposal. No Monitoring required.	6,700 ppm Total Lead
Malta Gulch Tailings Impoundment & Leadville Corporation Mill	10/5/95 to 3/17/97	Metals, Sulfate, Cyanide	Consolidation, Grading, Capping and Reclamation	Must support vegetation.
Malta Tailings Impoundment -	8/9/96 to 3/31/97	Metals, Sulfate, Cyanide	Grading, Capping, and Revegetation	Must support vegetation
Malta Gulch Tailings Impoundment & Leadville Corporation Mill -	5/26/98 to 7/2/98	Drums (42) [2]	Removal from site and appropriate disposal. No monitoring required.	None

1) Principally, Arsenic, Cadmium, Copper, Lead and Zinc
2) 36 x 55 Gallon, 6 x 5 Gallon, containing acids, bases, flammable liquids

TABLE 1

MALTA GULCH TAILINGS IMPOUNDMENT

LEADVILLE CORPORATION

MALTA GULCH TAILINGS IMPOUNDMENTS - LEADVILLE CORP. (MGTI)

RECLAIMING MGTI

Site Name and Location (MGTI)

The Malta Gulch Tailings Impoundment - Leadville Corporation (MGTI) is located at the upper end of Malta Gulch about two miles west of the City of Leadville. Its general location is shown on the Operable Units and Areas of Responsibility Map which is attached as Exhibit 2. It is shown, in more detail, on the Maps which are attached as Exhibits MGTI-1 and MGTI-2. Ponds #1, #2, #3 & #5 are tailings impoundments. Ponds #4 & #6 are clarification ponds.

Site History (MGTI)

The Stringtown portion of the Leadville Mining Area District, which includes the Malta Gulch Tailings Impoundments ("MGTI"), was developed between 1879 and 1882 as a large group of placer claims.

It appears that the earliest use of this area for tailings disposal was from the fall of 1943 through August 1946 by the Ore & Chemical Company ("OCC"). OCC constructed a large tonnage sink-float mill near the site of the present day Leadville Corporation Mill. OCC deposited approximately 800,000 tons of tailings behind low profile berms. These berms appear to have been unsuccessful in completely containing the tailings and there appears to have been periodic releases of OCC tailings into the Lower Malta Gulch. The OCC tailings berms became the pre-cursors to the current basins known as Impoundments # 1 and # 2.

From the period of 1945 to 1973, there was no activity at this portion of the Site although ownership of the property changed hands numerous times. The property was purchased by its current owner, Leadville Corporation, in 1968. In 1974, the Hecla Mining Company (Hecla), in conjunction with Day Mines, leased the property as a site for disposal of tailings generated from its milling of ores from the Sherman Mine which was a silver mine in a dolomite formation. The Malta Gulch Tailings Impoundments, in their present configuration, were constructed in 1974 by Hecla/Day. Hecla/Day also constructed 4 tailings impoundments (#1, #2, #3 & #5) and two clarification ponds (#4 and #6). The entire facility occupies approximately 23 acres. Additional information regarding the six structures is shown on the attached maps/cross sections which are identified as Exhibits MGTI-3, MGTI-4 and MGTI-5. Full size drawings of the exhibits are available in the Administrative Record.

These milling operations were permitted and bonded by the State of Colorado's Division of Minerals & Geology, and the permit remains in effect.

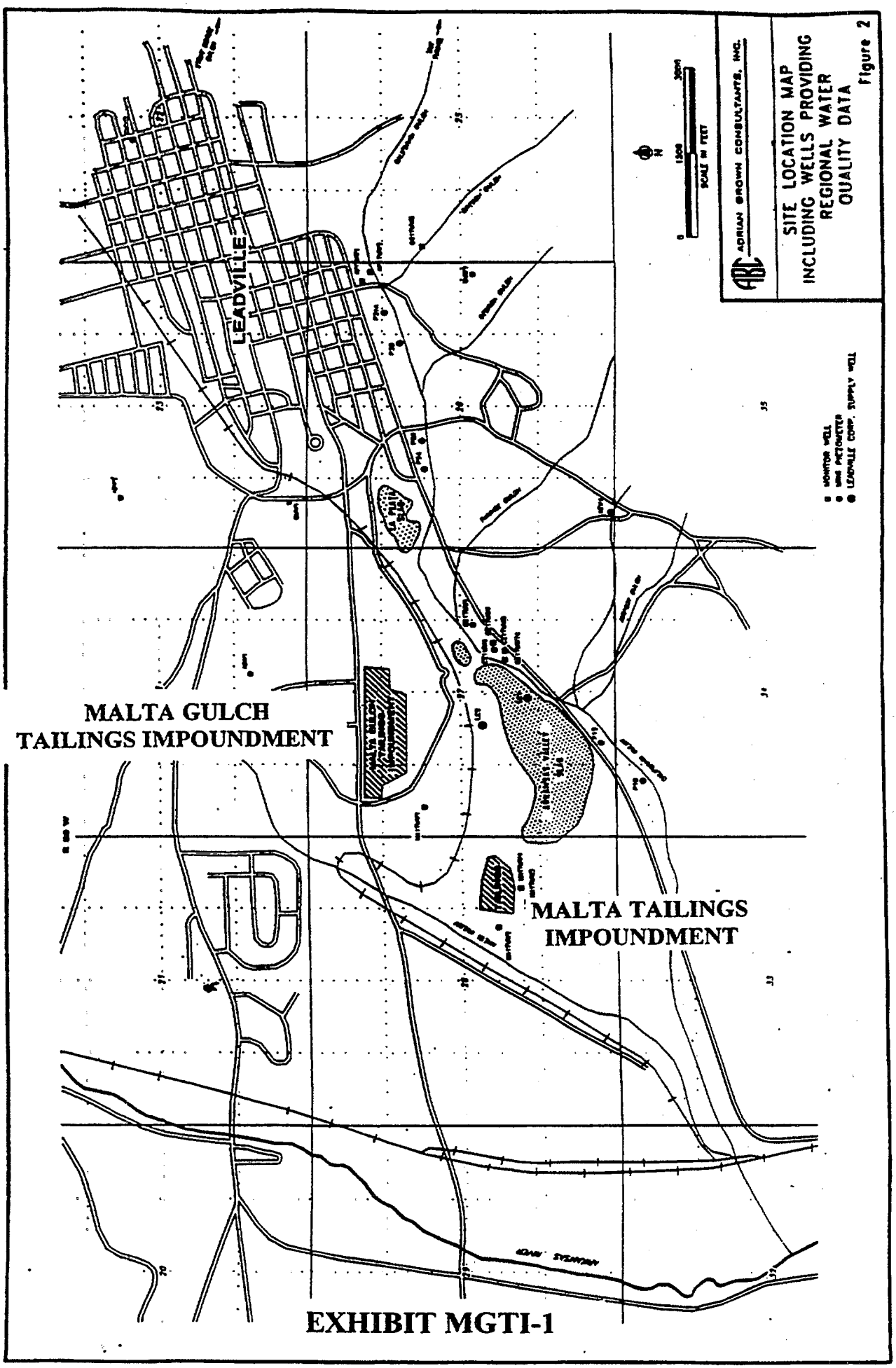


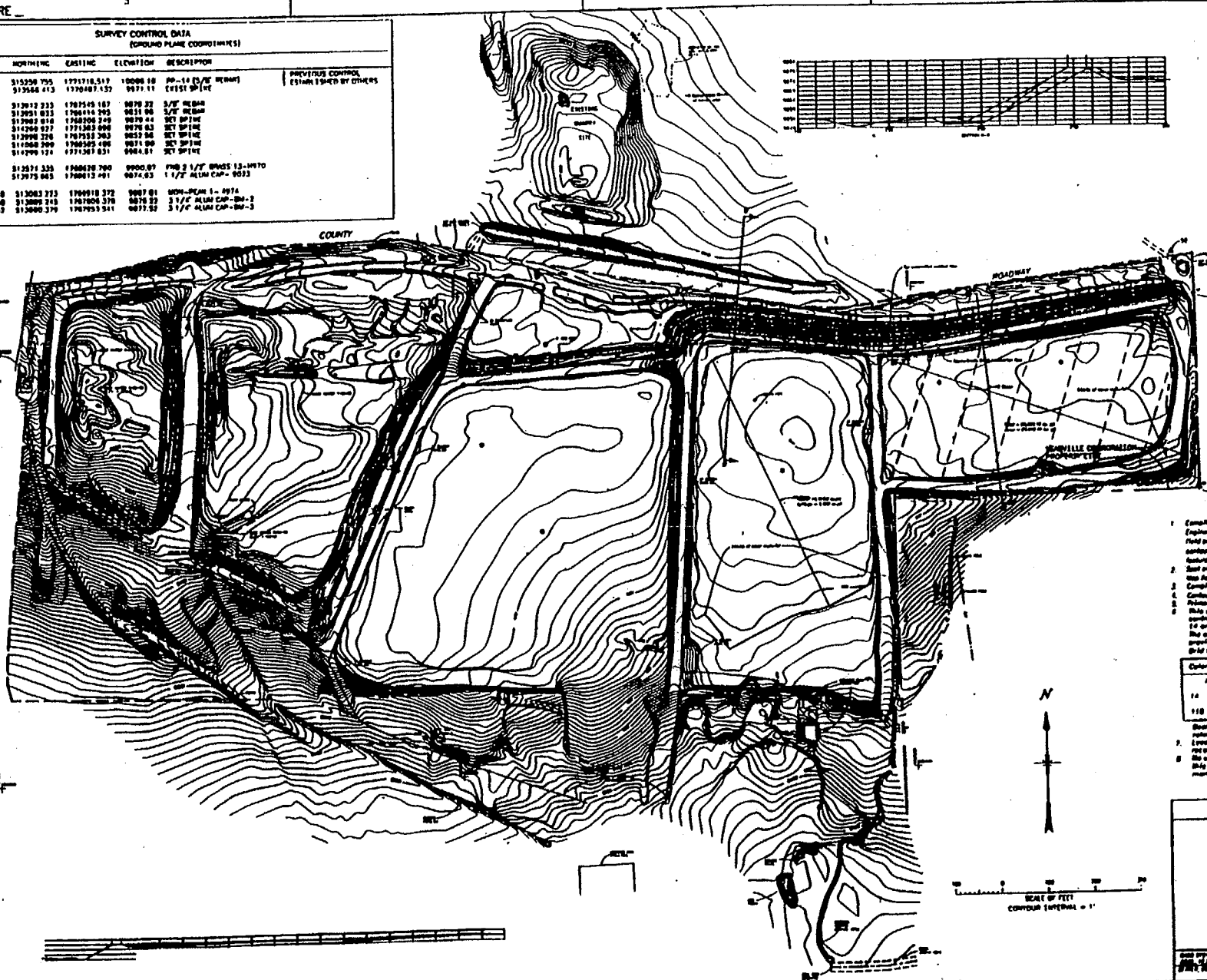
EXHIBIT MGTI-1

FIGURE _

SURVEY CONTROL DATA
(GROUND PLANE COORDINATES)

PT	NORTHING	EASTING	ELEVATION	DESCRIPTION
14	513250.755	1771710.517	10006.10	PP-14 (5/8" REBAR)
110	513568.413	1770407.157	9971.11	EXIST SPIKE
40	513913.233	1767549.187	9970.22	5/8" REBAR
41	513951.033	1766414.795	9951.90	5/8" REBAR
42	513962.914	1768506.249	9970.44	SET SPIKE
50	514290.927	1771303.090	9970.03	SET SPIKE
51	513990.326	1767553.703	9952.96	SET SPIKE
52	514060.399	1766549.490	9971.00	SET SPIKE
53	514299.124	1771367.831	9966.01	SET SPIKE
60	513971.335	1768620.790	9900.07	PKD 2 1/2" BRASS 13-H970
61	513975.065	1768612.491	9974.03	1 1/2" ALUM CAP- 9033
3510	513083.223	1769918.372	9987.01	MON-PEAK 1- 4974
3530	513809.243	1767606.370	9970.22	3 1/4" ALUM CAP-BM-2
3552	513600.379	1767953.541	9977.52	3 1/4" ALUM CAP-BM-3

PREVIOUS CONTROL ESTABLISHED BY OTHERS



LEGEND

- 3" MONITORING WELL
- FOUND MONUMENT (See drawing for size and type)
- MONITORING CONTROL POINT (Set spike or rebar)
- 4" STAND PIPE
- 4"x4" CASING WITH 3" PVC STAND PIPE INSIDE
- EDGE OF WATER
- FENCE LINE

NOTES

1. Compiled by Grayestable, Johnson & Anderson, Consulting Engineers and Land Surveyors, Minneapolis, Minnesota, using field surveyed and elevations and computer integrated contours, and field surveyed locations for physiographic features.
2. Spot elevations and physiographic features meet National Map Accuracy Standards.
3. Compiled from ground-based methods in July, 1995.
4. Contour Interval is one foot.
5. Primary vertical and horizontal control by U.S.E.P.A.
6. This survey is tied to existing state plane coordinate control which were found instruments of control points 14 and 110.
   The combined scale factor used = .9994130 as provided by U.S.E.P.A.
   Grid to ground factor calculated by GMM = 1.00030 9340
   Coordinates rotated to true north using -00°00'35" rotation from grid bearing to true bearing.
7. Lexington Corporation property boundary is projected from record information as shown on existing survey grade.
8. No underground utilities (if any) were marked for this survey. A utility locate should be requested and marked on the ground prior to any construction.

Colorado state plane coordinates (central zone - NAD 27)			
PT	NORTHING	EASTING	ELEVATION
14	513501.05	1771701.10	10006.10
110	513501.01	1770307.06	9971.11

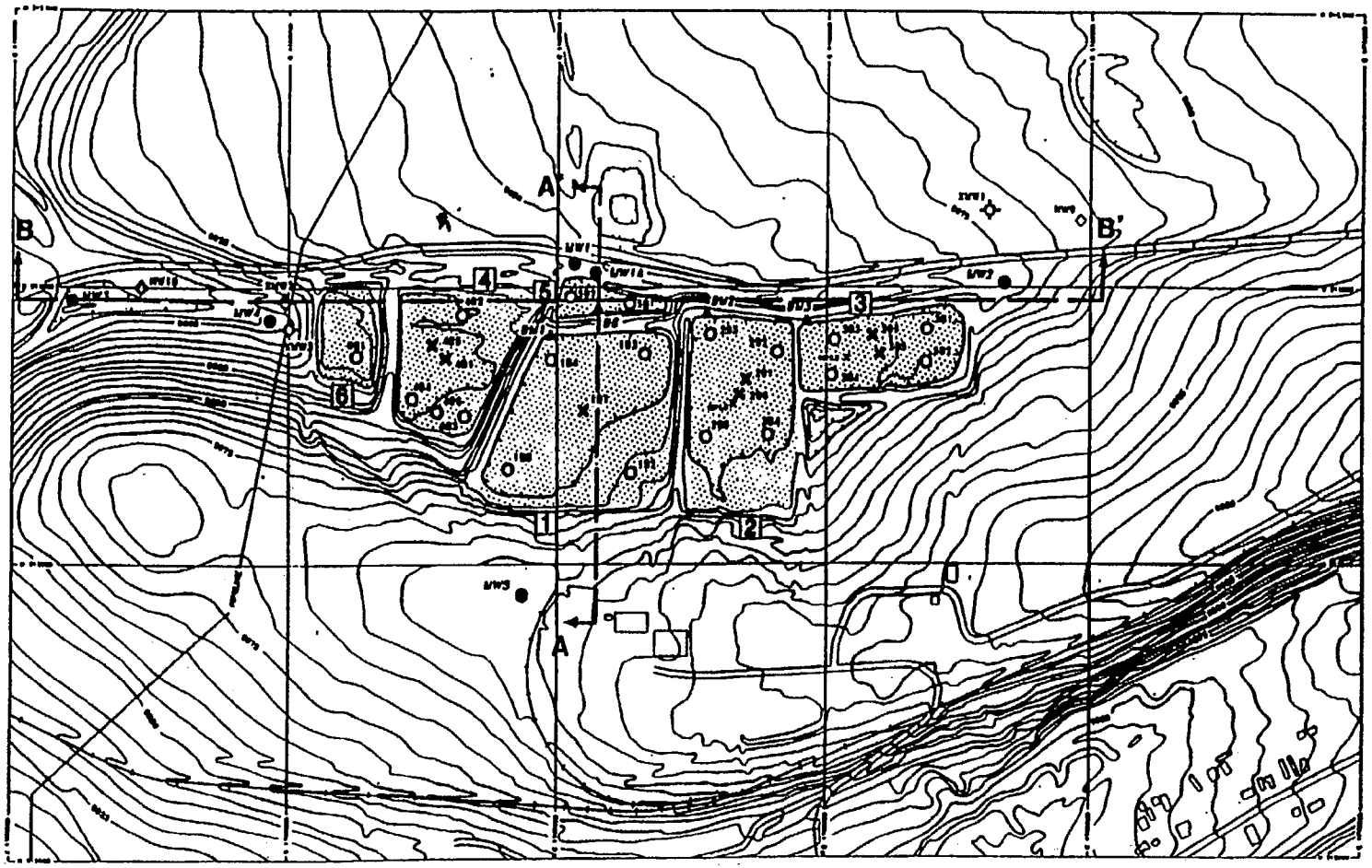
SAFETY

CALIFORNIA GULCH NPL LTDF SITE
LEADVILLE, COLORADO

TIME CRITICAL REMOVAL ACTION
MALTA GULCH AND MALTA GULCH
TAILINGS IMPOUNDMENT SITE

FIGURE

EXHIBIT MGTI-2



LEGEND

- HECLA MONITORING WELL (B-MG-MW-)
- HECLA SLANT HOLE-PLUGGED (B-MG-1B8)
- TAILINGS BENCH MARK
- SHALLOW SOIL (4') BORINGS
- "DEEP" (THROUGH TAILINGS) SOIL BORINGS
- OLD MONITORING WELLS (MW)
- EPA MONITORING WELLS (MW)
- TAILING PONDS, WITH NUMBERS 1

A — A'
B — B'

LINE OF CROSS SECTION

SCALE IN FEET

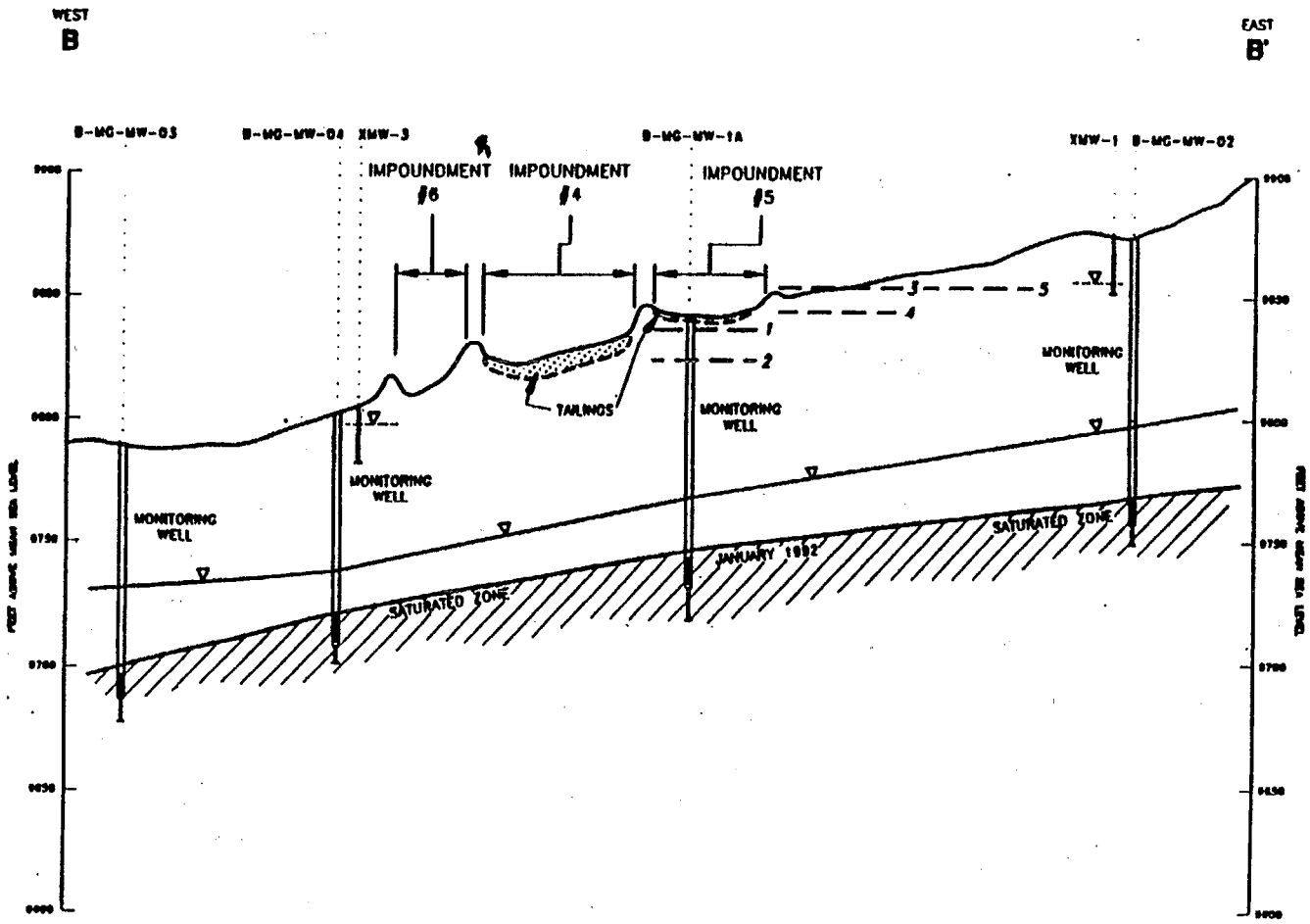
CONTOUR INTERVAL = 5'

ADRIAN BROWN CONSULTANTS, INC.

BORING LOCATIONS
MALTA GULCH TAILINGS

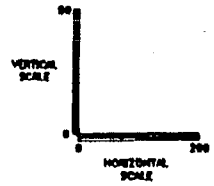
Figure 4

EXHIBIT MGTI-3



NOTE:

1. PROJECTION OF BASE OF DAY/HECLA TAILINGS, IMPOUNDMENT #1
2. PROJECTION OF BASE OF PRE-HECLA TAILINGS, IMPOUNDMENT #1
3. PROJECTION OF BASE OF DAY/HECLA TAILINGS, IMPOUNDMENT #2
4. PROJECTION OF BASE OF PRE-HECLA TAILINGS, IMPOUNDMENT #2
5. PROJECTION OF MAXIMUM DEPTH TO BASE OF DAY/HECLA TAILINGS, IMPOUNDMENT #3 (NO PRE-HECLA TAILINGS)



▽ POTENTIOMETRIC SURFACE

ADRIAN BROWN CONSULTANTS, INC.

EAST-WEST CROSS SECTION THROUGH MALTA GULCH SITE

MAY, 1992

Figure

EXHIBIT MGTI-4

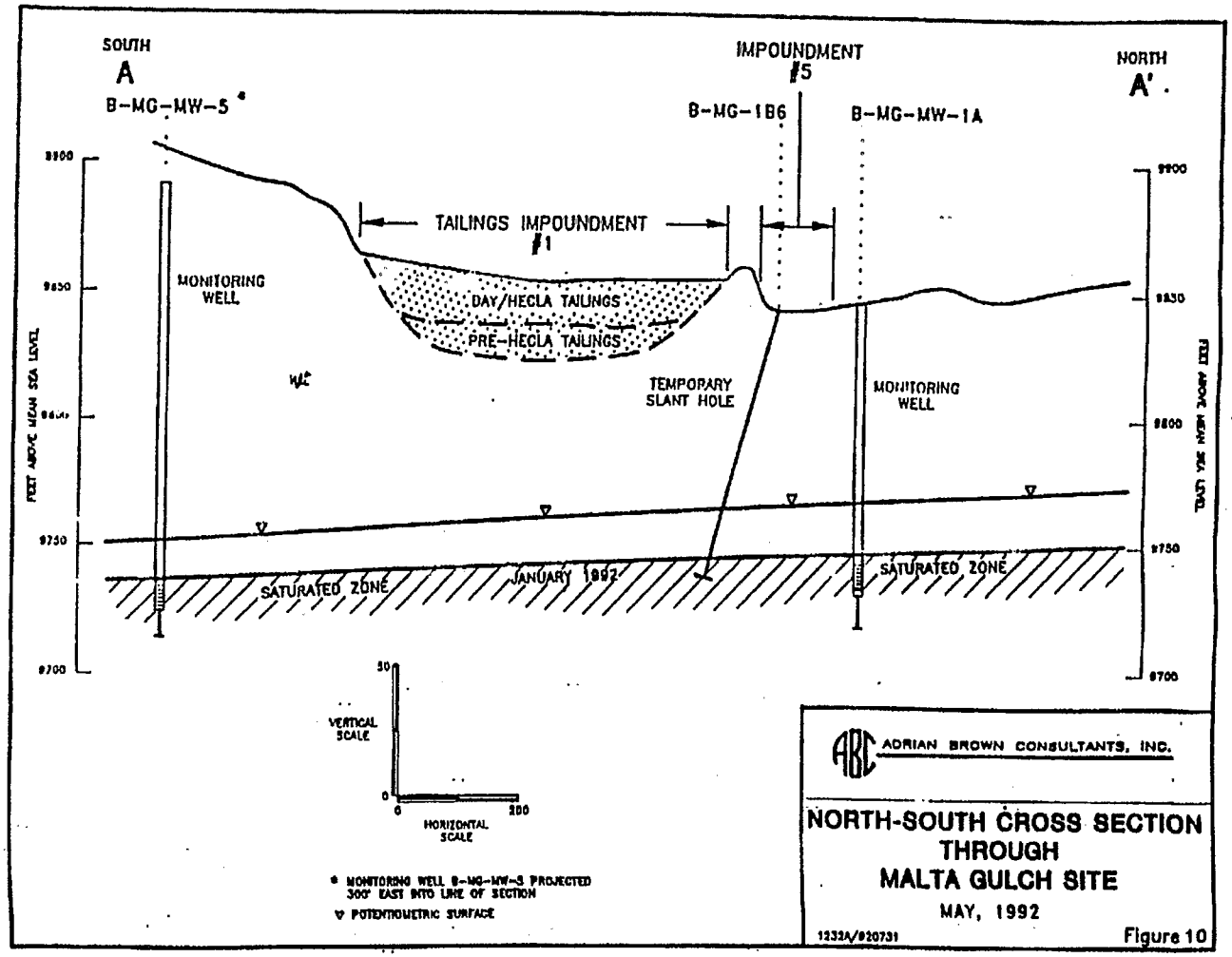


EXHIBIT MGTI-5

Hecla leased the MGTI from Leadville Corporation until 1987. During its leasehold, Hecla/Day operated an on-site flotation mill that generated approximately 680,000 tons of tailings. No cyanide was used in the processing during this time.

The Leadville Corp. refitted the mill to use a cyanide leaching process and approximately 50,000 tons of dolomitic tailings were added to the impoundments in 1988.

Enforcement Activities (MGTI)

In September 1991, EPA and Hecla signed an Administrative Order on Consent for the performance of an Engineering Evaluation/Cost Analysis (EE/CA) at the Malta Gulch Tailings Impoundments. The purpose of the EE/CA was to determine the nature and extent of any releases at and from the MGTI and to determine an appropriate response action. In August 1993, the EE/CA was approved as final. An Action Memorandum, officially selecting the EE/CA's preferred alternative, was issued by EPA on September 10, 1993.

In January 1993, the United States and Hecla Mining Company entered into a partial consent decree which settled Hecla's "Sitewide Liabilities." According to this decree, Hecla reimbursed the United States for costs incurred to respond to releases of hazardous substances at portions of the Site other than areas where the Malta Gulch Tailings had come to be located. The United States and Hecla settled Hecla's liabilities for release of Malta Gulch Tailings in a "Remaining Liabilities" partial consent decree, entered by the United States District Court for the District of Colorado on August 17, 1994. Under the terms of this latter consent decree, $688,000 were set aside to perform the cleanup of the MGTI.

In January 1993, the United States and Leadville Corporation entered into a partial consent decree which settled Leadville Corporations "Sitewide Liabilities". According to this decree, Leadville Corporation agreed to a payment schedule to reimburse the United States for costs incurred to respond to potential releases of hazardous substances, for which Leadville Corporation had potential liabilities.

Community Participation (MGTI)

At Leadville, Colorado, the public interest in the clean up of this Superfund Site has been intensive; many public meetings have been held. Numerous Fact Sheets have been released to the public. On August 2, 1993, the public was notified in the local newspaper that the *Final Engineering Evaluation/Cost Analysis (EE/CA), Malta Gulch Tailings, Leadville, Colorado*, dated July 29, 1993 was

available for review and comment. EPA held a public meeting in Leadville on August 12, 1993. The comment period continued through September 1, 1993. EPA responded to all comments on the EE/CA in a Responsiveness Summary which was prepared in September 1993 prior to the issuance of the Action Memorandum on September 10, 1993.

Site Risks & Characterization (MGTI)

The July, 1993 (EE/CA) concluded that the principal threats were: (1) the potential for ingestion by individuals, during casual use, through direct contact with the tailings material which is contaminated with heavy metals; and (2) the potential release of heavy metals, cyanide, and sulfates to groundwater as a result of precipitation events.

The six impoundments comprising MGTI were sampled from surface to a depth of 4 feet or to the total depth of tailings whichever was smaller and from 4 feet to the depth of the natural ground. The principal purpose of this effort was to determine the extent and chemical characteristics of the Hecla and Pre-Hecla tailings. The boring locations are shown on Exhibit MGTI-2. Seventeen shallow soil samples and seven deep soil samples were collected. The results of this sampling event are contained in the EE/CA. Tables summarizing the data are produced below:

Summary of Solid Chemistry of Shallow Tailings (Table 6 in EE/CA)

Parameter	Range (mg/Kg)	Mean (mg/Kg)	Median (mg/Kg)
Arsenic	8 - 600	99	21
Cadmium	25 - 69	46	43
Lead	800 - 5600	2058	1800
Mercury	0.3 - 2.3	0.9	0.8
Zinc	2600 - 9400	5941	5710

Summary of Deeper Tailings Solids - Pre Hecla (Abstracted from Table 8 in EE/CA)
Impoundment #1- Depth Interval = 25.8 - 31 Feet

Parameter	Concentration (mg/Kg)
Arsenic	90
Cadmium	32.9
Lead	3,400
Mercury	0.55
Zinc	7,150
Cyanide	10.0

Summary of Deeper Tailings Solids - Pre Hecla (Abstracted from Table 8 in EE/CA)
Impoundment #2- Depth Interval = 24.0 - 27.1 Feet

Parameter	Concentration (mg/Kg)
Arsenic	152
Cadmium	87.3
Lead	4,680
Mercury	0.81
Zinc	14,400
Cyanide	8.6

Prior to implementation of the Removal Action, surface soils samples were collected and analyzed by XRF for lead, by the U.S. BOR in August, 1996. The impoundment was marked off in 100 foot grids. Sixty-four (64) samples had a range of lead concentrations from 1,700 to 57,600 parts per million (ppm). Sample locations are shown on Exhibit MGTI-6 which is attached. Source: *Final Construction Report to the Environmental Protection Agency on 1996 OU2/OU7 Construction Activities, California Gulch NPL Site, Leadville, Colorado, March 1997.)* Lead was used as the indicator contaminant of concern because for the alternative response actions being considered, the control of lead would also control any other contaminant of concern.

Surface runoff is ephemeral and of low volume. Its impact on the main reach of Malta Gulch appears to be very low.

Groundwater samples from upstream and downstream monitoring wells in Malta Gulch were collected by the U.S. BOR on June 26, 1996. The up stream well is identified as B-MGMW-02 East; the down stream well is identified as

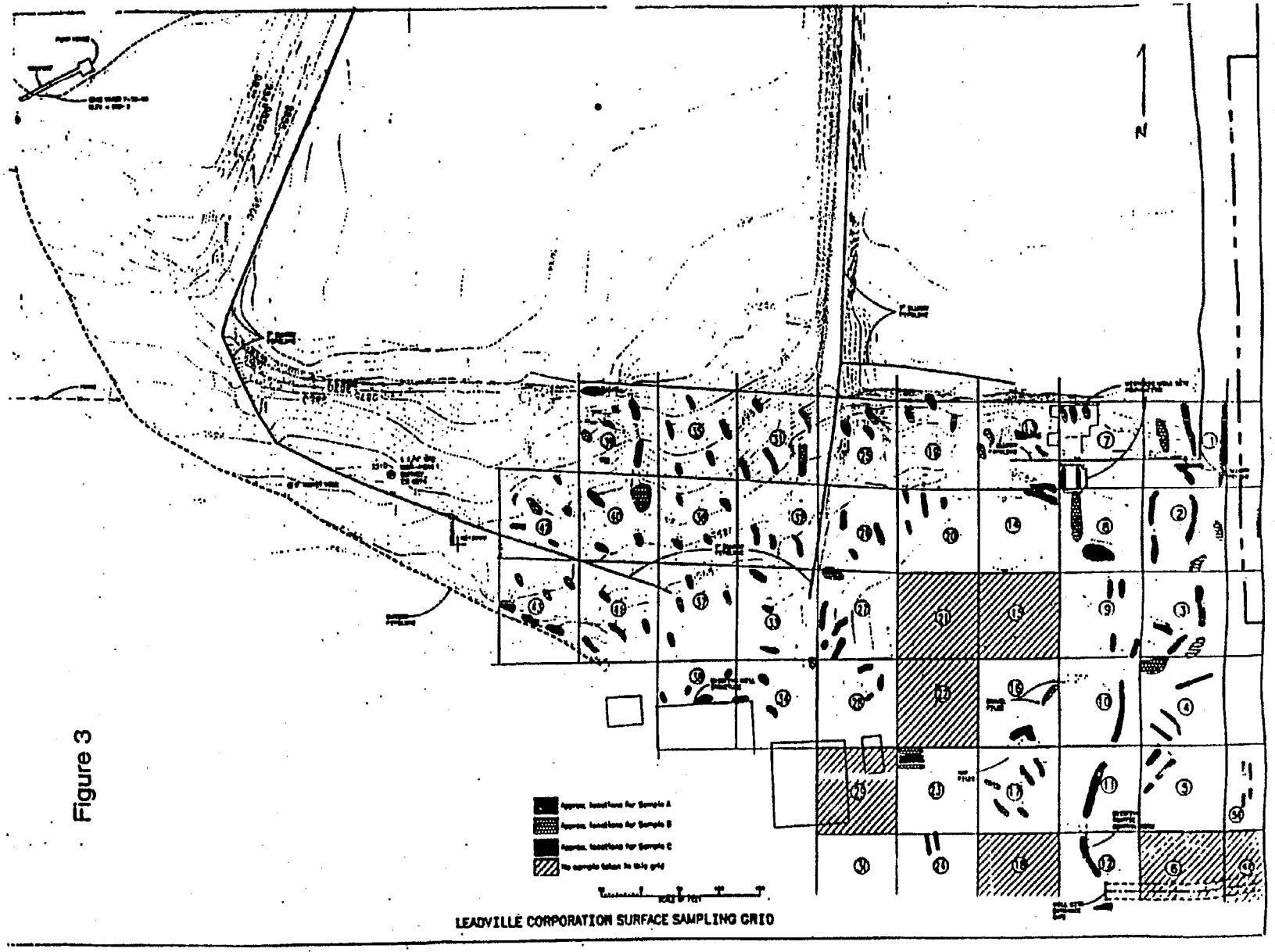


Figure 3

EXHIBIT MGTI-6

B-MGMW-05 South. The locations of the wells and groundwater elevation contours are shown on MGTI Exhibit 7, attached. Water quality data for the contaminants of concern for these wells from samples collected on June 26, 1996, are summarized below:

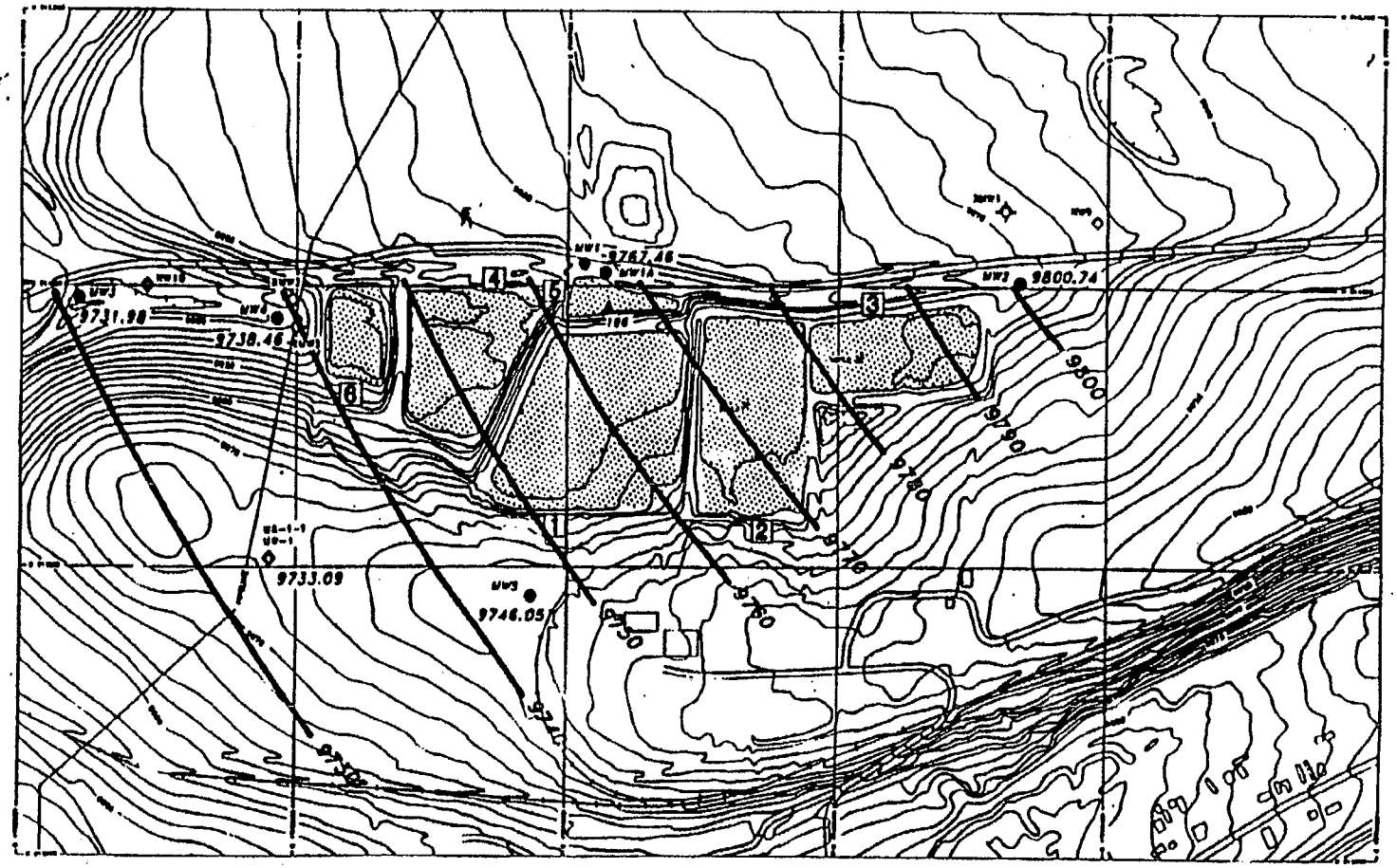
U.S. BOR Groundwater Data - Malta Gulch Tailings Impoundments (ug/L)

	B-MGMW-02 (Up Stream) Total Metals June 1996	B-MGMW-02 (Up Stream) Diss. Metals June 1996	B-MGMW-05 (Down Stream) Total Metals June 1996	B-MGMW-05 (Down Stream) Diss.Metals June 1996
Arsenic	<1.00	<1.00	1.87	<1.00
Cadmium	<0.10	<0.10	9.31	9.10
Copper	<5.00	<5.00	<5.00	Not Analyzed
Lead	<1.00	<1.00	1.43	1.38
Zinc	6.34	<4.00	1,160	1,143
Sulfate	68 mg/L	Not Applicable	368 mg/L	Not Applicable

Potential pathways of exposure can be found in the EE/CA. A copy of the Conceptual Site Models for the Current Conditions and the Post-Closure Phase of this response action are attached as Exhibits MGTI-8 and MGTI-9.

The EE/CA also found that the MGTI is geotechnically stable. The EE/CA references an earlier report prepared by Dames and Moore in 1985 entitled *Additional Geotechnical Studies for Hecla Mining Company, Leadville Unit, Colorado.* This report was prepared for submission to the Division of Mines and Geology under the Mined Land Reclamation Permit for MGTI. However, subsequent inspections conducted in 1995 by EPA found fractures in the north berm along ponds 2 & 3 requiring stabilization.

Alternatives for addressing the principal threats from the MGTI were developed in the EE/CA. The Alternatives considered were: 1) No Action; 2) Institutional Controls; 3) Regrade and Reclaim; and, 4) Site Consolidation and Reclamation. Based on the findings of the EE/CA, EPA determined that the risk to human health and the environment posed by the material in the MGTI would be substantially reduced or eliminated by implementation of capping and closure. measures. The alternative selected by EPA for the MGTI was set out in a September 10, 1993 Action Memorandum.



LEGEND

- HECLA MONITORING WELL (P-MG-WW-)
- HECLA SLANT HOLE-PLUGGED (P MG-196)
- OLD MONITORING WELLS (XMW)
- EPA MONITORING WELLS (MW, MW)
- TAILING PONDS, WITH NUMBERS 1

ADRIAN BROWN CONSULTANTS, INC.

GROUNDWATER ELEVATION
MALTA GULCH TAILINGS
MAY, 1992

Figure 7

EXHIBIT MGTI-7

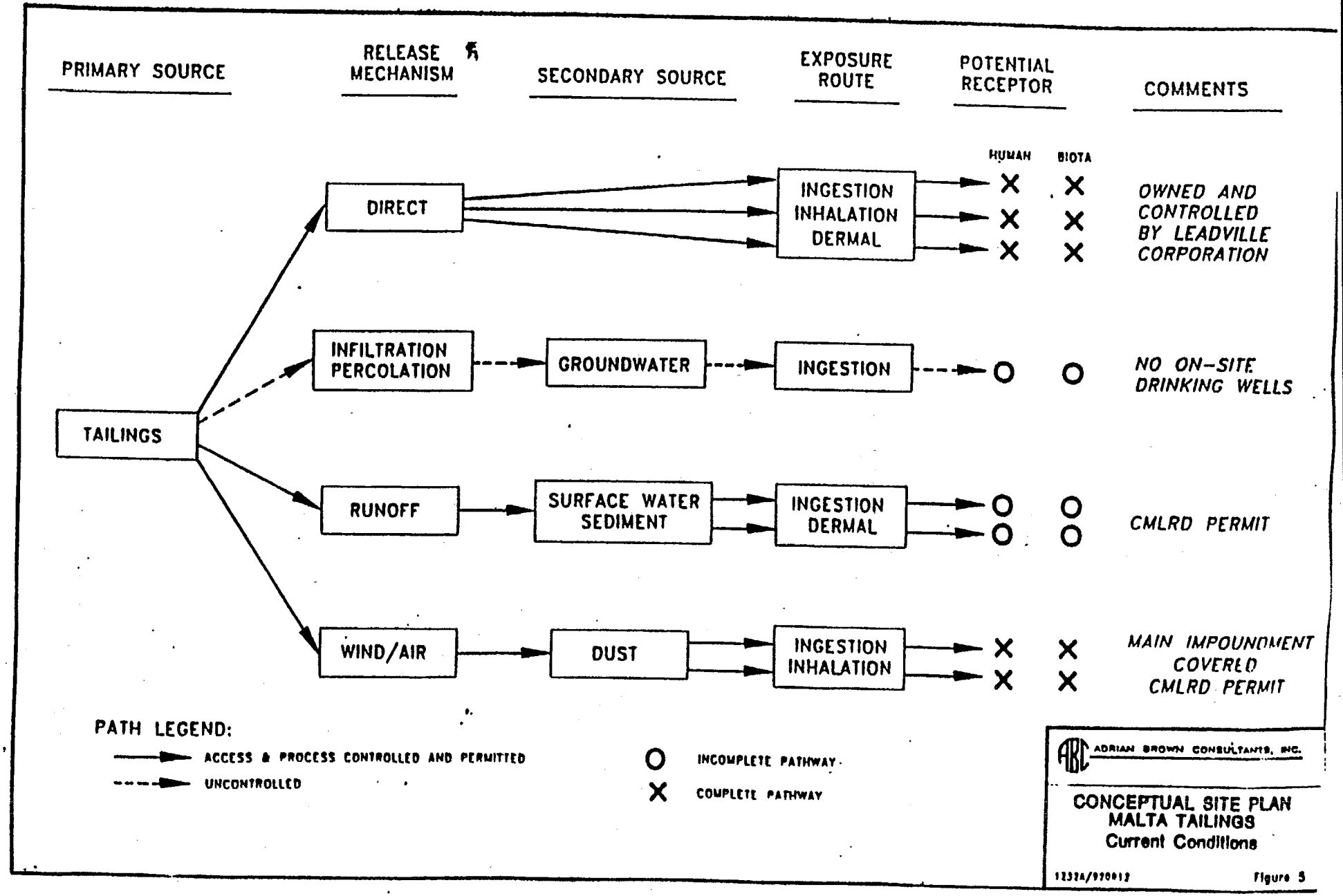


EXHIBIT MGTI-8

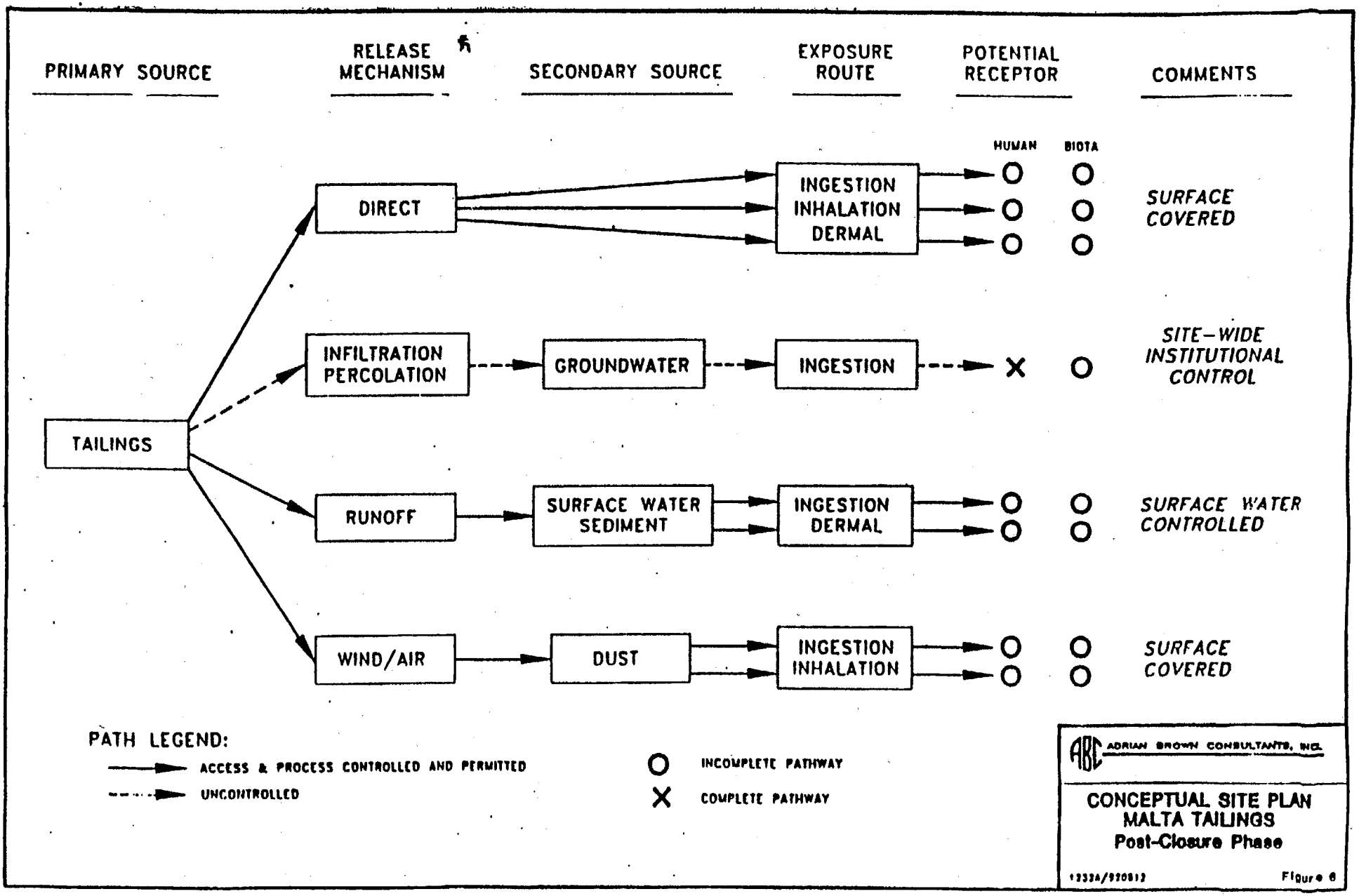


EXHIBIT MGTI-9

Response Action (MGTI) - Reclaiming MGTI

The MGTI consists of four tailings impoundments and two clarification ponds which cover about 23 acres. The Removal Action included: consolidation, grading, capping, and revegetating the impoundments. Prior to the EPA Removal Actions, the property owner, Leadville Corp. under direction from the Division of Minerals and Geology, placed a 6" to 12" dolomite and soil cover over the tailings to minimize fugitive dust from blowing from the site.

The work conducted by EPA at the MGTI was performed in two field seasons. The work commenced on October 5, 1995 and was completed on October 15, 1996. The selected removal action required that the MGTI be graded, its slopes stabilized, capped with "borrow material" to a depth of 18", and revegetated. The "borrow material" was obtained from an existing borrow pit located north of the tailings impoundments, and consisted of native glacial deposit soils found in the area. Before this action was completed, EPA consolidated about 30,000 cubic yards of contaminated material from Lower Malta Gulch and transported them to MGTI.

The 1995 construction activities included stripping the vegetation from the borrow area and production of rip-rap. Between October 5, 1995 and November 3, 1995, approximately 6,800 cubic yards of pit run borrow material were placed and compacted in the new 2:1 slope face along the northern side of Impoundments #2 & #3 where recent subsidence of the embankment had occurred subsequent to the 1985 Dames & Moore site inspection and report. This borrow material was in addition to 2,033 cubic yards of original slope material which was excavated and recompacted in place. 1995 activities also included construction of a rip-rap geotextile spillway from impoundment # 2 to control runoff; and, reestablishment of the local drainage and fencing. In the fall of 1999 impoundment #3 was regraded to promote drainage and revegetated.

In 1995, Clarification Ponds #4, and #6 and Tailings Impoundment #5 were to be covered with borrow material in barren areas where tailings were subject to wind erosion to enhance the work previously conducted by Leadville Corp. This was accomplished at Pond #5 which was covered with approximately one foot of unprocessed borrow material. A notch was cut and rip-rapped in the downstream berm of Pond #5 to provide high inflow release capacity. However, soft ground conditions and snow cover forced postponement of the work at Ponds #4 and #6 until 1996.

The complete details of the 1995 construction work at MGTI can be found in the referenced report (*Hecla Impoundment Slope Re-construction/Malta Gulch Final Removal Action Construction Report for OU-02*) by the Bureau of Reclamation dated January 1996.

The work remaining after the 1995 construction season required to complete the removal action selected in the August 1995 Action Memorandum was performed in 1996. A small, bare area in Impoundment #1 was covered with approximately two feet of native glacial till cover material from the adjacent south slope distributed by dozer. The tailings in Clarification Pond #4 were removed from the upper portion of the pond, down to the original grade, and consolidated into Tailings Impoundment #3. The excavated area was then revegetated. The bare areas in Impoundments #4 & #6 were covered with approximately two feet of compacted cover from the borrow pit. The final site grading insures that all precipitation runoff flows into Impoundments #1, #2 or #3. The covered areas, including the north slopes of Impoundments #2 and #3, were hydro-seeded. The revegetation work was based on the Field Revegetation Studies In Selected Malta Gulch Test Pits, Leadville, Colorado, dated October 8, 1996, which is included as Appendix E of the March 1997 BOR Report. The seed mixture is shown in Figure 2 of the Field Revegetation Studies Report.

The complete details of the 1996 construction work at MGTI can be found in the referenced report (Final Construction Report for 1996 Construction Activities at OU2/OU7) by the Bureau of Reclamation dated March 1997.

Confirmation samples of the cover material were not needed because the "borrow material" was from a vegetated area and therefore should not contain elevated levels of metals.

The capping, revegetation, and fencing installed by the property owner around the perimeter of the site all serve to substantially reduce or eliminate the risks from direct contact with the contaminated materials. Potential releases of contaminants to groundwater are reduced or eliminated by the capping, revegetation, and reconstruction of the slopes. These measures serve to keep water from precipitation events from directly contacting the contaminated materials, which serves to reduce or prevent metals from potentially affecting groundwater. Lead is the principal contaminant of concern. However, the response action performed will address all contaminants of concern in the waste material.

Monitoring (Reclaiming MGTI)

In order to ensure continued protectiveness of the remedy, long-term monitoring will be required to assure that the cover material and vegetation remain effective. A revegetation monitoring plan will be developed to monitor the condition of the revegetated areas. In addition, present zoning of the MGTI is Industrial Mining which will not allow uses inconsistent with the remedy, hence periodic monitoring and review is necessary to verify that zoning of the MGTI has not been changed to allow uses inconsistent with the remedy. Procedures will be established to notify EPA of any proposed zoning or land use changes. These procedures and other measures will be established in coordination with the other Operable Units where wastes are left in place. EPA will then make a determination on whether the proposed change is consistent with the remedy. Further, the MGTI is covered by a DMG permit that would allow the present owner of this facility to use this property as a mine waste impoundment. Thus, monitoring is also necessary by EPA, to periodically review the status of this DMG permit and use of the mill and impoundments. Upon termination of the permit, and after final reclamation activities have been implemented under the bond held by DMG, EPA will review the site conditions to assure that final construction of the remedy is consistent with performance standards for the other Operable Units. EPA will conduct additional work if necessary to address any identified adverse impacts to surface and ground water resulting from contaminant releases from the tailings.

MALTA GULCH TAILINGS IMPOUNDMENT

LEADVILLE CORPORATION

DRUM REMOVAL

MALTA GULCH TAILINGS IMPOUNDMENT - DRUM REMOVAL (MGTI) - LEADVILLE CORPORATION MILL

Site Name and Location (Drum Removal - MGTI Mill)

The Leadville Corporation mill is located at the southern boundary of MGTI. The mill area is shown on a map of OU 2 which is attached as Exhibit 3.

Site History (Drum Removal - MGTI Mill)

In 1997, officials of the State's Division of Minerals & Geology conducted a mine permit inspection and discovered that forty-two (42)drums, in one of the buildings at the Leadville Corporation mill, were corroding and beginning to leak as evidenced by moisture on the drum surfaces. No leakage from any of the drums was found on the ground surface. Since Leadville Corporation did not have the resources to dispose of the drums, the State's Division of Minerals and Geology requested EPA's Emergency Response Team to dispose of them. Thirty-six (36) x 55 gallon drums and 6 x 5 gallon drums were involved. The drums contained hazardous substances which represented a threat to human health and the environment. The drums contained acids, bases and flammable liquids.

Enforcement Actions (Drum Removal - MGTI Mill)

Prior to commencing this removal action, EPA notified Leadville Corporation of the problem and offered it the opportunity to conduct this removal action. Leadville Corporation declined the opportunity.

Community Participation (Drum Removal MGTI Mill)

This action was performed as a Time-Critical Removal. No public meeting was held. Information regarding this action is available in the U.S. EPA, Region VIII, Superfund Record Center.

Site Risks and Characterization (Drum Removal - MGTI Mill)

The forty-two (42) drums located on the site contained acids, bases and flammable liquids. The Action Memorandum dated April 15, 1998 determined that these drums represented an immediate threat of exposure to hazardous substances through direct contact or ingestion by trespassers, vagrants or nearby residents.

Response Action (Drum Removal - MGTI Mill)

This Removal Action addressed the need to mitigate the threats to the environment and health posed by thirty-six 55-gallon drums and six 5-gallon containers which contained acids, bases and flammable liquids. The drums/containers found at the site were in various conditions from slightly to severely corroded. The Removal Action was performed under an Action Memorandum dated April 15, 1998. All hazardous materials were removed from the site and were disposed of appropriately. This response action started on May 26, 1998 and was completed on July 2, 1998.

Monitoring (Drum removal - MGTI Mill)

This was a complete removal, no future monitoring is required.

LOWER MALTA GULCH
FLUVIAL TAILINGS

LOWER MALTA GULCH FLUVIAL TAILINGS (LMG)

Site Name and Location (LMG)

The Lower Malta Gulch Fluvial Tailings (Fluvial Tailings #7) lie directly downstream of the Malta Gulch Tailings Impoundments. Malta Gulch runs in a southwesterly direction for about three miles where it joins California Gulch. (See Exhibit LMG-1 attached)

Site History (LMG)

According to the July 1993 EE/CA for the Malta Gulch Tailings Impoundment removal action, the fluvial tailings in Lower Malta Gulch originated from the milling operations conducted by the Ore & Chemical Company (OCC) from the fall of 1943 through August 1946. This was prior to the Leadville Corporation (Hecla) operation which began in 1974. OCC had constructed a large tonnage sink-float mill near the site of the present day Leadville Corporation Mill. OCC deposited approximately 800,000 tons of tailings behind low profile berms. These berms appear to have been unsuccessful in completely containing the tailings and there appears to have been periodic releases of OCC tailings into the Lower Malta Gulch. Tailings and waste material from these operations remain near Malta Gulch.

Enforcement Activities (LMG)

EPA performed the removal action at LMG using Fund monies.

The United States, as a successor to the Ore & Chemical Company (OCC), has settled its liabilities for the OU 2 area in the August 25, 1994 Consent Decree. These settlement amounts were based on the proportionate share of liability the United States had as the Successor to the Alien Property Custodian or OCC's successor corporation.

Community Participation (LMG)

This action was performed as a Time-Critical Removal. No public meeting was held. Information regarding this action is available in the U.S. EPA, Region VIII, Superfund Record Center.

Site Risks and Characterization (LMG)

According to the *Tailings Disposal Area Remedial Investigation Report, California Gulch site, Leadville, Colorado, January 1994*, by Woodward-Clyde, LMG Fluvial Tailings Site #7 consists of a single contiguous area and can be accessed from the west of the Malta Gulch Tailings Impoundments area and across Malta Gulch. A railroad grade exists on the west side and parallel to the Malta Gulch. The Malta Gulch is approximately 500 feet wide and 2500 feet long and slopes at an estimated three percent to the southwest. The closest home is

approximately 300 feet to the southwest.

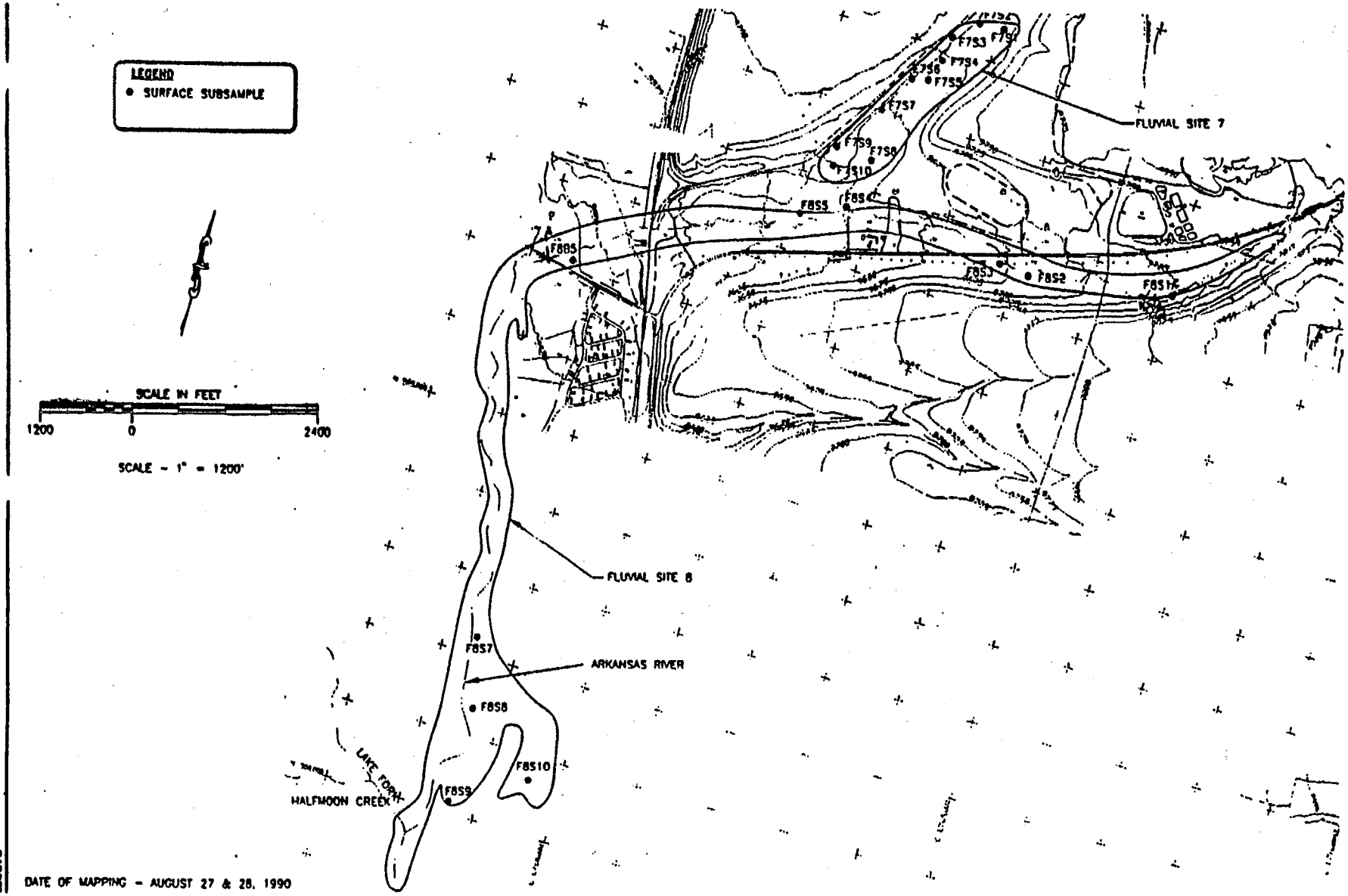
The Tailings Disposal RI Report states that Fluvial Tailings Site #7 covers an area of approximately 26 acres. Eighteen (18) soil samples at nine (9) locations (surface and at depth) were collected in Lower Malta Gulch and analyzed for lead by XRF. The sample locations are shown on Exhibit LMG-1. The lead content found in the fluvial tailings ranged from 20 to 47,800 parts per million (ppm). Based on data from previous remedial investigations, it was thought that the site contained an estimated volume of 10,000 cubic yards with an estimated average tailings depth of one-fourth foot. Additional samples were collected to improve the efficiency of the response action by more precisely defining the areal extent and depth of contamination in the Lower Malta Gulch. Thirty-five (35) test pits on approximately 200 foot centers across the valley were excavated and the soil was sampled and analyzed to determine the lead concentration, the physical soil characteristics and what revegetative soil amendments might be required. Samples were also analyzed for lead, arsenic, copper, cadmium and zinc. The lead concentrations ranged from 5.5 to 16,152 ppm. Estimates of the amount of material to be removed increased to 30,000 cubic yards.

Response Action (LMG)

The Removal Action for the LMG, Fluvial Tailings # 7 was performed in the 1995 and 1996 construction seasons. This removal action was performed as a Time Critical Removal Action, in accordance with an Action Memorandum dated August 14, 1995. The materials excavated from LMG were disposed at the Malta Gulch Tailings Impoundment (MGTI) prior to the Non-Time Critical Removal Action which was planned for MGTI in 1996.

During the 1995 construction season, approximately 34,000 cubic yards of contaminated material was removed from LMG and deposited in MGTI Pond #3. Four check dams in the site drainage, and a diversion berm above LMG were constructed to manage surface runoff by runoff passing surface water through the upper portion of the site from the Hecla Impoundment site (MGTI). These structures also act as a deterrent to unauthorized use by vehicles.

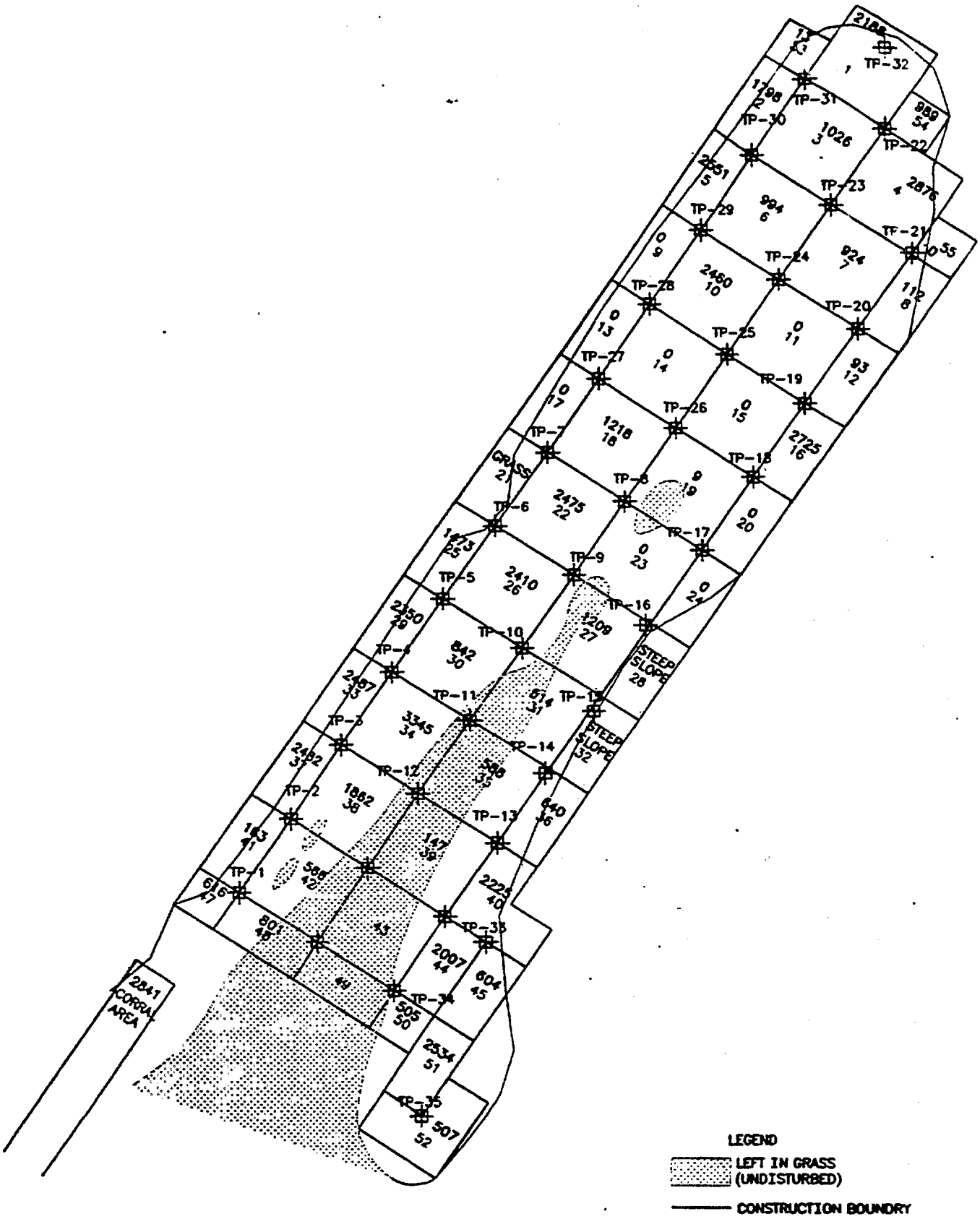
After excavation of the fluvial tailings, the soil was analyzed to confirm that the removal achieved the clean-up level of 6,700 ppm total lead, the concentrations for lead exposure identified as protective for worker exposure as identified in the Baseline Human Health Risk Assessment Part C, dated April 1995. Approximately 45 samples were collected on 200 foot centers. However, all field confirmation sampling results concluded that the lead levels were below the residential clean-up level of 3,500 ppm total lead as finalized in the September 2, 1999 Record of Decision for OU9. A map showing the post removal lead concentrations is attached as Exhibit LMG-2. This lead concentration is also more conducive to revegetation. U.S. Bureau of Reclamation determined that soils with a concentration of lead at or below 3,500 ppm, contained zinc at a satisfactory level for supporting vegetation.



WATER WASTE & LAND INC.

FIGURE 8 - 6
APPROXIMATE SURFACE TAILINGS
SAMPLE LOCATIONS
FLUVIAL TAILINGS SITES No. 7 AND No. 8

EXHIBIT LMG-1



MALTA GULCH FLUVIAL TAILINGS
FINAL CLEAN UP LEAD LEVELS (ppm)
EXHIBIT LMG-2

The complete details of the 1995 construction work at Lower California Gulch can be found in the referenced report (*Hecla Impoundment Slope Reconstruction/Malta Gulch Final Removal Action Construction Report for OU-02*) by the Bureau of Reclamation dated January 1996.

Revegetation work in Malta Gulch was performed in 1996. Malta Gulch was hydro-seeded at a rate of 20 to 30 lbs/acre, with a recommended seed mixture and Biosol Plus, an organic fertilizer, following ripping and incorporation into the soil of the recommended lime equivalent amounts of local dolomite gravel.

The complete details of the 1996 construction work at Lower Malta Gulch fluvial tailings can be found in the referenced report *(Final Construction Report for 1996 Construction Activities at OU2/OU7)* by the Bureau of Reclamation dated March 1997. The revegetation work was based on the *Field Revegetation Studies In Selected Malta Gulch Test Pits, Leadville, Colorado, dated October 6, 1996,* which is included as Appendix E of the March 1997 BOR Report. The seed mixture is shown in Figure 2 of the Field Revegetation Studies Report.

Monitoring (LMG)

This removal action addressed potential risks by the complete removal of the tails from LMG and disposal of these tailings in the MGTI where the tailings have been capped. This was a total removal of the contaminated fluvial tailings. Subsequent monitoring in 1997 and 1998 have verified that the revegetation was successful and no long term monitoring is required. Confirmatory sampling demonstrated that residual contamination levels after the removal were below the residential action levels, thus no institutional controls are necessary at this portion of OU 2.

MALTA TAILINGS IMPOUNDMENT

LEADVILLE SILVER & GOLD

MALTA TAILINGS IMPOUNDMENT (MTI)

Site Name and Location (MTI)

The Malta Tailings Impoundment (Leadville Silver & Gold Mill facility) is located 1.5 miles west of Leadville, 0.8 miles north of Stringtown and 0.6 miles north of California Gulch. (See Exhibit MTI-I attached)

Site-History (MTI)

The Leadville Silver & Gold, Inc. constructed a mill to recover pyritic materials from various tailings and waste materials from nearby properties which had been obtained under leasehold arrangements. This pyritic materials recovery process operated from 1983 through 1988.

Approximately 2,000 tons of pyrite were shipped to various off-site smelters for use as a flux. As a result of this operation, approximately 10,000 cubic yards of tailings was generated or disposed of at the Malta Tailings Impoundment.

Enforcement Activities (MTI)

On September 3, 1993, a Consent Decree between the United States and Leadville Silver & Gold (LSG) was entered by the U.S. District Court for the District of Colorado. In accordance with that Consent Decree, LSG must perform the response action contained herein unless it can demonstrate that it does not have the financial ability to pay or perform the cleanup. LSG has agreed that it has the financial ability to conduct the monitoring to assure the long-term stability of the consolidated cap.

Community Participation (MTI)

This action was performed as a Time-Critical Removal. No public meeting was held. Information regarding this action is available in the U.S. EPA, Region VIII, Superfund Record Center.

Site Risks & Characterization (MTI)

The Malta Tailings Impoundment consists of three small impoundments surrounded by berms and occupies 4.6 acres of nearly flat land at the top of a ridge. The total volume of tailings is estimated to be slightly in excess of 10,000 cubic yards.

Areas within the immediate vicinity of the tailings impoundments are littered with scrap metal, concrete slabs, and other mining/processing material. There was also a stockpile of mine waste, including drums of product, nearby.

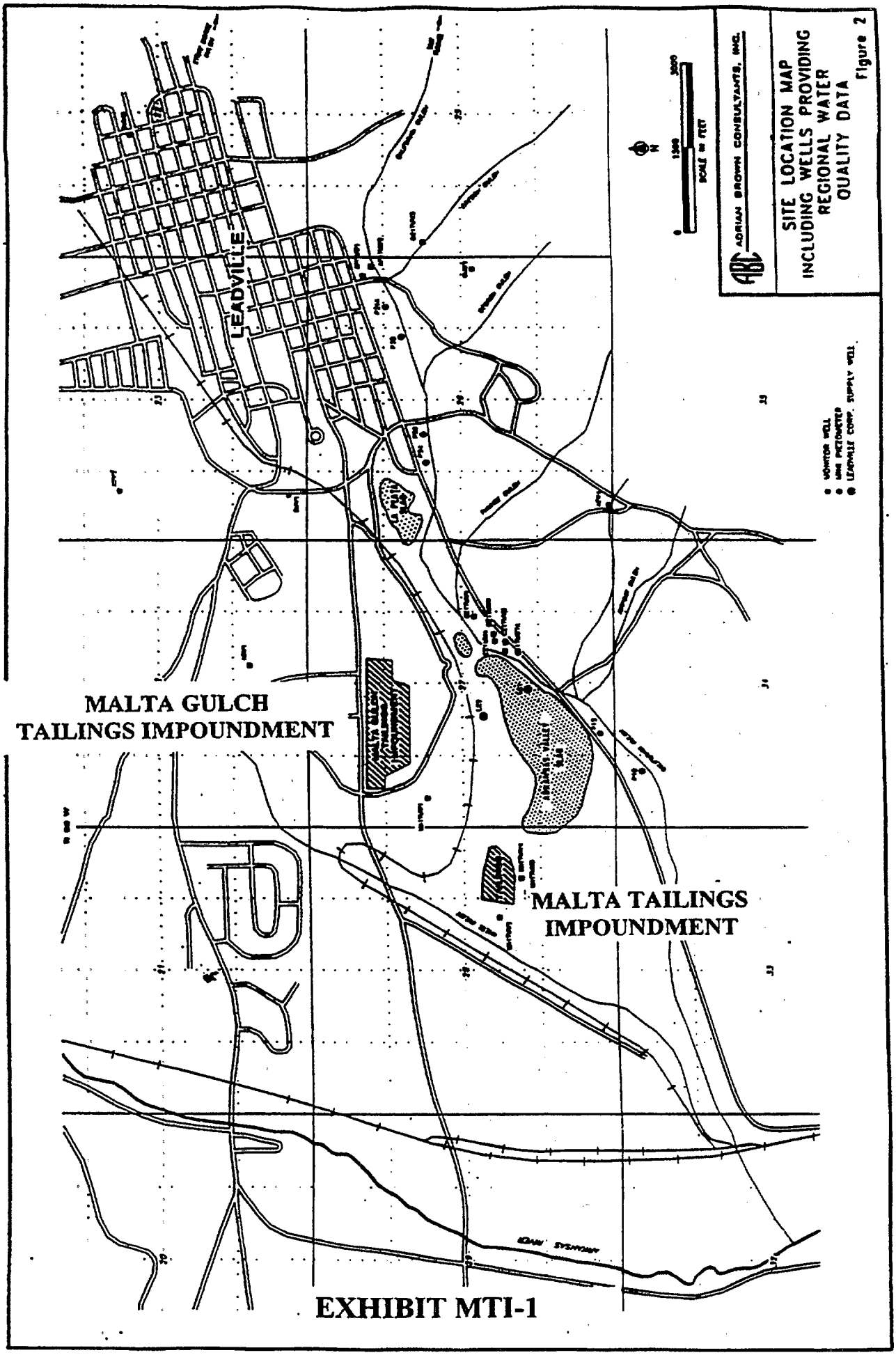


EXHIBIT MTI-1

The berms have retained their structural integrity. Surface water flow is ephemeral and occurs near the impoundments only during periods of extended and/or intense precipitation. There are no signs of water overflowing these berms.

Sampling of the surficial soils reveals elevated concentrations of cadmium, copper, lead, silver, and zinc and in the subsurface tailings elevated levels of arsenic, cadmium, lead, and zinc. Composite sample locations are shown on Exhibit MTI-2.

A number of metals from the subsurface soils were tested by Method 1312, Toxic Characteristic Leaching Process (TCLP). The results of the TCLP tests were within regulatory requirements.

According to the *Tailings Disposal Area Remedial Investigation Report, California Gulch Site, Leadville, Colorado,* January, 1994, by Woodward-Clyde (Table 5-6) the surface soils in the Malta Tailings Impoundment (MTI) contain the following concentrations of the contaminants of concern:

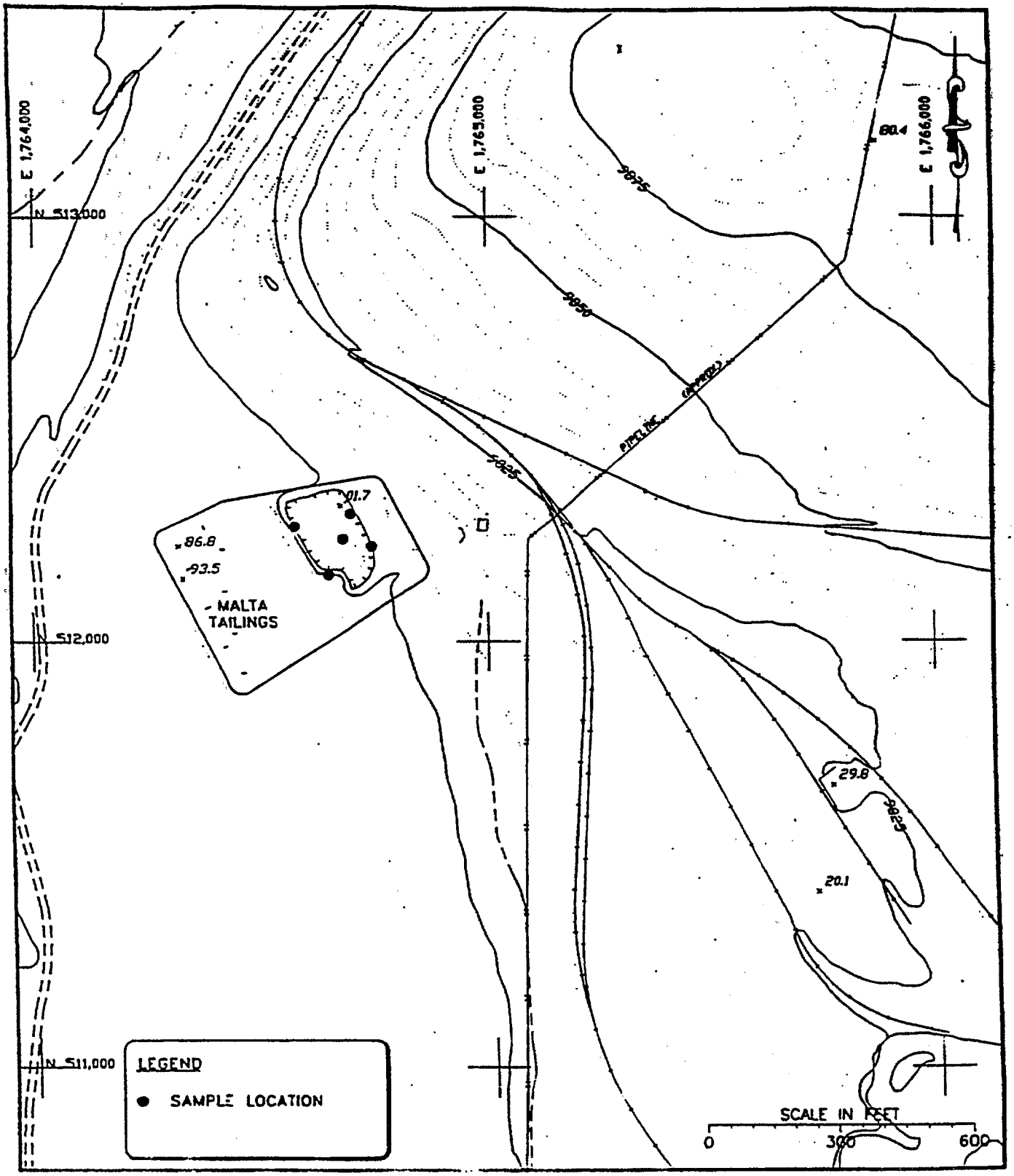
CONTAMINANT	CONCENTRATION (mg/Kg)
Arsenic	64.7J
Cadmium	60.8
Copper	428
Lead	3,850
Zinc	7,250

Similarly, one soil sample which was collected from the Malta Tailings Impoundment, at the 4-5 foot interval, on September 19, 1991, contained the following:

CONTAMINANT	CONCENTRATION (mg/Kg)
Arsenic	8.2
Cadmium	132
Copper	Not analyzed
Lead	7,250j
Zinc	14,700

One sample of ponded water at the MTI was collected on September 19, 1991 and analyzed. The principal contaminants are: arsenic 63,300 ug/L; cadmium 21,200 ug/L; lead 2,200 ug/L and zinc 3,120,000 ug/L.

The June 1996 groundwater monitoring performed by the U.S. BOR provided analytical data for the contaminants of concern, from up-gradient and down-gradient monitoring wells around the Malta Tailings Pile (See Exhibit MTI-3 attached). Only dissolved metals were determined. The report is attached to the U.S. BOR, March 1997 Report as Appendix A. The data are summarized below:



WATER WASTE & LAND INC.

FIGURE 5-2
APPROXIMATE LOCATION OF SUBSAMPLES COLLECTED FOR SURFACE TAILINGS SAMPLING

Date: NOV 1992

Project: 22909C

EXHIBIT MTI-2

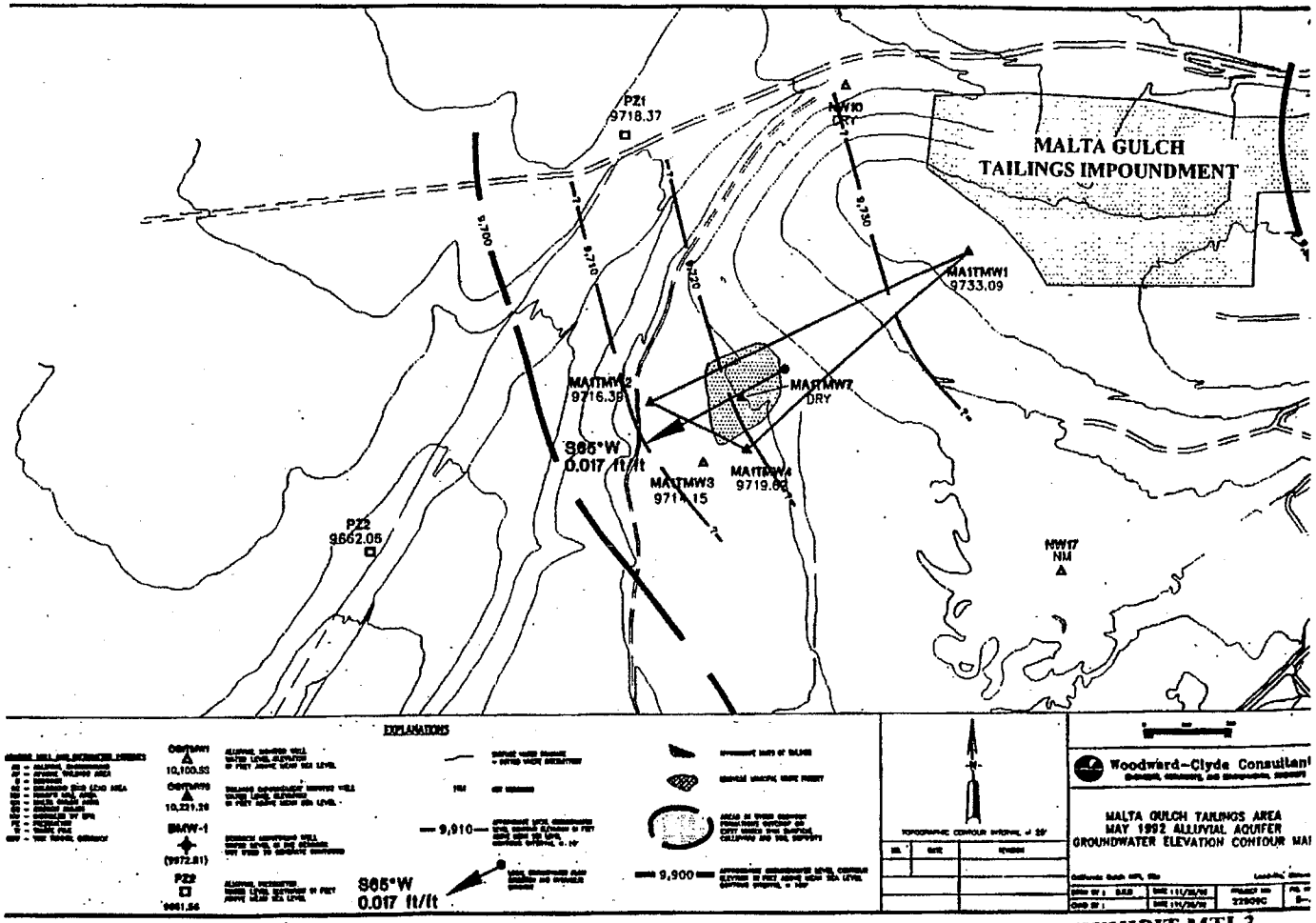


EXHIBIT MTI-3

U.S. BOR Groundwater Data - Malta Tailings Impoundments (ug/L)

	MAITMW-04 (Up-Gradient) Total Metals June 1996	MAITMW-04 (Up-Gradient) Diss. Metals June 1996	MAITMW-02 (Down Gradient) Total Metals June 1996	MAITMW-02 (Down Gradient) Diss. Metals June 1996
Arsenic	NOT TAKEN	<1.00	NOT TAKEN	1.12
Cadmium	NOT TAKEN	0.12	NOT TAKEN	<0.10
Copper	NOT TAKEN	<5.00	NOT TAKEN	<5.00
Lead	NOT TAKEN	1.46	NOT TAKEN	<1.00
Zinc	NOT TAKEN	8.33	NOT TAKEN	5.37

A complete description of the site characteristics may be found in the Remedial Investigation Report by Woodward-Clyde cited above.

Response Action (MTI)

The native soils in this area are not disturbed and are not phytotoxic. Accordingly, the native soils pose no risk to human health or the environment and no response action was deemed necessary.

The tailings and pyritic material, however, do present a risk to human health and the environment, since they are a source of acid mine drainage. The acid mine drainage generated by these materials may present a potential threat for contamination of ground water, since such a pathway of exposure does exist at this portion of the Site.

The removal action selected in the August 1996 Action Memorandum was to consolidate the acid-generating materials, neutralize the acidic leachate, cap and revegetate. These removal action goals were achieved by grading the impoundments to eliminate ponding and then applying dolomitic limestone to a depth of eight inches. Following the application of the dolomite, an 18 inch layer of borrow material (local soils from the berms of MTI) was added to provide a base for the revegetation. Twelve (12) confirmation soil samples were collected from the soil surface to be revegetated. The samples were analyzed for lead using XRF. The clean-up level for the response actions is 6,700 ppm lead, the concentrations for lead exposure identified as protective for worker exposure as identified in the Baseline Human Health Risk Assessment Part C, dated April 1995. The lead concentration of the twelve samples confirmation samples ranged from 700 to 5400 ppm. The sample locations are shown on Exhibit MTI-4. Table 2 of the 1997 BOR Report provides the analytical data. The seed mixture used on Lower Malta Gulch was also used for the MTI revegetation.

The piles of pyrite concentrate, and drums were removed during the 1996 construction season, for use as a product.

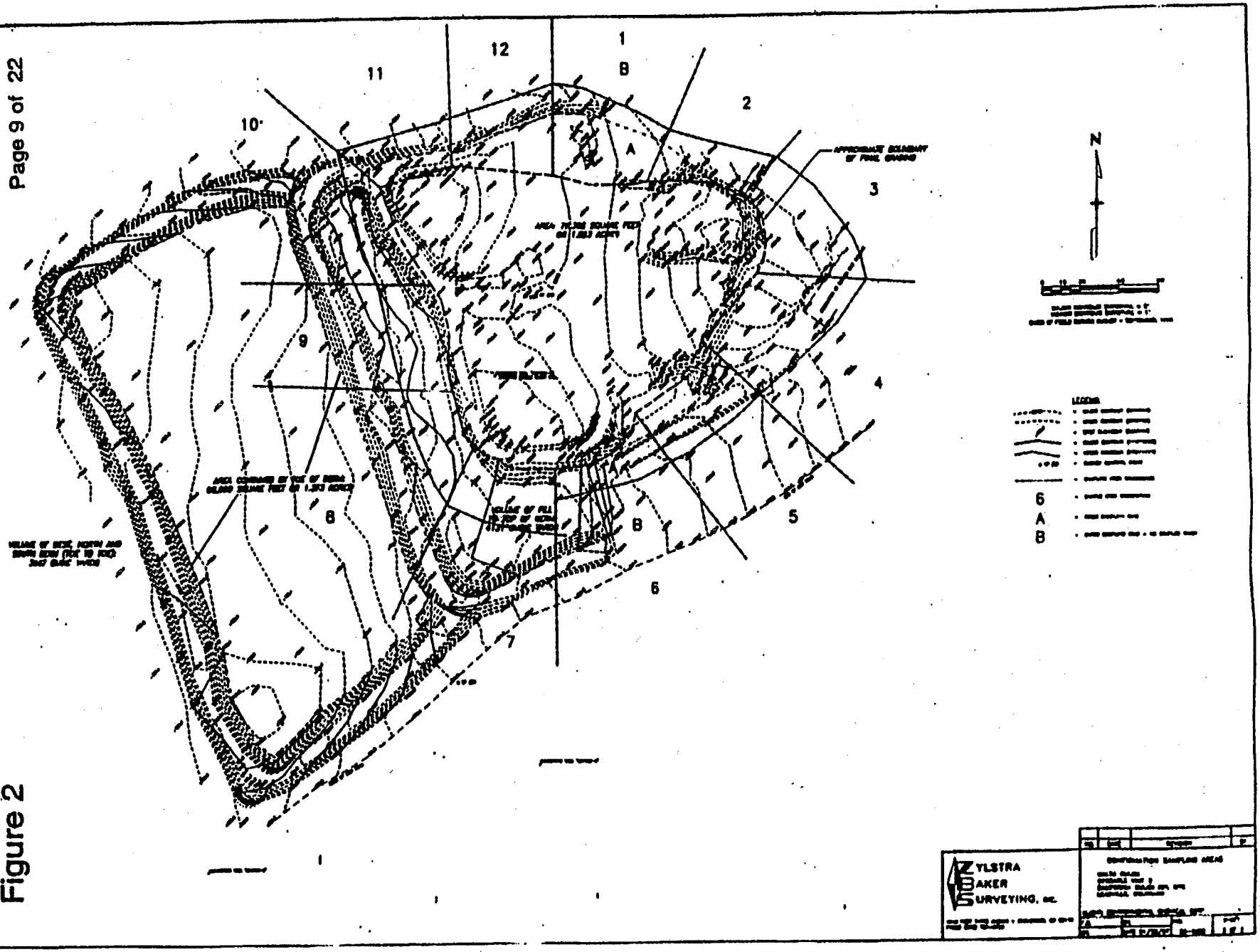


Figure 2

EXHIBIT MTI-4

The complete details of the 1996 construction work at the Malta Tailings Impoundment can be found in the referenced report (*Final Construction Report for 1996 Construction Activities at OU2/OU7)* by the Bureau of Reclamation dated March 1997. The revegetation work was based on the Field Revegetation Studies In Selected Malta Gulch Test Pits, Leadville, Colorado, dated October 6, 1996, which is included as Appendix E of the March 1997 BOR Report. The seed mixture is shown in Figure 2 of the Field Revegetation Studies Report.

Monitoring (MTI)

In order to ensure continued protectiveness of the remedy, long-term monitoring will be required to assure that the cover material and vegetation remain effective. In addition, present zoning of the MTI is Industrial Mining which will not allow uses inconsistent with the remedy, periodic monitoring and review is necessary to verify that zoning of the MTI has not been changed to allow uses inconsistent with the remedy. EPA will negotiate with LSG to provide for long-term monitoring and financial assurance.

SELECTED REMEDY - NO FURTHER ACTION

Performance of the removal actions outlined above have greatly reduced or eliminated any potential risk posed to human health or the environment from releases of hazardous substances found at the Malta Gulch Tailings Impoundments, Lower Malta Gulch and Malta Tailings Impoundment portions of OU 2 of the Site. Accordingly, EPA has determined that further removal or remedial actions are not necessary, since there are no unacceptable risks to human health or the environment at or from OU 2 of the Site.

EPA and the Colorado Department of Public Health and Environment have selected a "NO FURTHER ACTION" Remedy for OU 2 because removal actions which have been completed for the Malta Gulch Tailings Impoundments, Leadville Corporation Mill, Lower Malta Gulch and the Malta Tailings Impoundment have eliminated or significantly reduced the risk to human health or the environment from hazardous substances that may remain at OU 2 of the Site.

Periodic monitoring of the MGTI and the MTI are necessary to assure the effectiveness of the caps placed on these impoundments and to assure that the present institutional controls, zoning and DMG permit for the MGTI and zoning for the MTI, have not substantially been altered such that inconsistent uses may be allowed on these portions of OU 2.

Because this decision results in hazardous substances remaining on site, above health-based levels, five-year reviews of the previous response actions will be required. These reviews will be conducted in conjunction with site-wide five-

year reviews.

This decision document makes no determination on whether surface water or ground water within OU 2 requires remediation. Pursuant to the August 25, 1994 Consent Decree at this Site, it was agreed that the decision on remediation of surface and groundwater site-wide (Operable Unit 12) would be made only after records of decision for source remediation were selected and implemented at each operable unit. This decision document therefore determines that for purposes of source remediation at OU 2 , no additional response actions, either removal or remedial, are necessary beyond the removal actions already performed at the component parts of OU 2. If additional response actions are necessary to meet surface and/or ground water requirements, those actions will be designated in the record of decision for operable unit 12.

EPA announced its preferred alternative in a Proposed Plan for California Gulch, Operable Unit 2 in a Fact Sheet dated March 1997. The Colorado Department of Public Health and Environment concurred in selection of this alternative. A Public Meeting was held on March 19, 1997 and public comments relative to the Proposed Plan were accepted from March 19, 1997 through April 18, 1997. EPA's responses to all comments are included in the Responsiveness Summary attached as Appendix B.

APPENDIX A - REFERENCES

Phase I Remedial Investigation (RI). Dated May 1987. Prepared by CH2M Hill.

Tailings Disposal Area Remedial Investigation Report, California Gulch Site, Leadville, Colorado. Dated January 1994. Prepared by Woodward-Clyde for ASARCO, Inc.

Malta Gulch Tailings-Final EE/CA. Dated June 25, 1993,. Prepared by Adrian Brown Associates for Hecla Mining.

Final Screening Feasibility Study for Remediation Alternatives at the California Gulch NPL Site-Leadville, CO. Dated September 1993. Prepared by U.S. EPA, Region VIII.

Additional Geotechnical Studies for Hecla Mining Company, Leadville Unit, Colorado, dated December 1985. Prepared for Hecla Mining Company

Final Baseline Aquatic Ecology Risk Assessment (BAERA) dated 1995. Prepared by Roy F. Weston for EPA.

EPA Action Memorandum (AM) dated September 10. 1993. *Action Memorandum for PRP Financed Removal Action at the Malta Gulch Tailings Impoundment Site.*

EPA Action Memo dated August 1995. *Action Memorandum for a Time Critical Removal Action for the Lower Malta Gulch portion of Operable Unit-02.*

EPA Action Memo dated August 9, 1996. *Action Memorandum for a Time Critical Removal Action for the Malta Tailings Impoundment of OU-02.*

Baseline Human Health Risk Assessment Part A, Risks to Residents from Lead/California Gulch Superfund Site dated November 1995. Prepared by Roy F. Weston for EPA.

Baseline Human Health Risk Assessment Part B, Risks to Residents from Contaminants Other than Lead/California Gulch Superfund Site dated January 1996. Prepared by Roy F. Weston for EPA.

Baseline Human Health Risk Assessment Part C, Evaluation of Worker Scenario/California Gulch Superfund Site dated April 1995. Prepared by Roy F. Weston for EPA.

Ecological Risk Assessment for the Terrestrial Ecosystem, California Gulch NPL site, Leadville, Colorado dated January 1997. Prepared by Roy F. Weston for EPA.

Final Construction Report for 1995 Construction Activities at OU 2, dated January 1996. Prepared by the Bureau of Reclamation for EPA.

Final Construction Report for 1996 Construction Activities at OU2/OU7, dated March 1997. Prepared by the Bureau of Reclamation for EPA.

Proposed Plan for Operable Unit 2, California Gulch Superfund Site , Leadville, Colorado, March 1997.

Cultural Resources Report, California Gulch Superfund Site, Operable Units 1 thru 12, for the period July 22, 1994 through July 1, 1998. The report is dated July 1998 and was prepared by EPA.

Final Pollution Report, California Gulch, Operable Unit 2, Non-Time Critical Removal Action at the Malta Gulch Tailings Impoundment Site, 1995 & 1996 construction seasons, July 7, 1998

Final Pollution Report, California Gulch, Operable Unit 2,Time Critical Removal Action at the Lower Malta Gulch portion of Operable Unit 2 (OU2), July 7, 1998

Final Pollution Report, California Gulch, Operable Unit 2,Time Critical Removal Action at the Malta Tailings Impoundment portion of Operable Unit 2 (OU2), July 7, 1998

Appendix B - Responsiveness Summary

During the 30 day public comment period for the Proposed Plan for the California Gulch site, Operable Unit 2 Record of Decision, EPA received written comments from Resurrection Mining Company. No verbal comments were received during the public meeting held on March 19, 1997. The following are EPA's responses to Resurrection's comments:

General Comments (EPA should conduct a RI/FS for OU2)

The Tailing Disposal Area Remedial Investigation, California Gulch site, Leadville, Colorado, January 1994 includes an assessment of the lower Malta Gulch fluvial tailing, and the Malta Tailings Impoundment. Since the Removal action in Lower Malta Gulch completely removed the tailings and was verified with confirmation sampling, no further studies or assessments are necessary. The Engineering Evaluation/Cost Analysis (EE/CA) for the Malta Gulch Tailings Impoundment (July 29, 1993) provides the equivalent of a Remedial Investigation/Feasibility Study and thoroughly assesses site conditions and a detailed analysis of the different alternatives or response actions. The Action Memorandums for the three Removal actions conducted in OU2 provide further discussions of the threats to health and environment and discuss the work to be preformed to mitigate the threats. Consequently, a RI/FS is not necessary for OU2. In addition any additional studies and subsequent response actions will be addressed under OU12 when site wide surface and ground water will be assessed upon completion of the response actions at all Operable Units 1 - 11. Further assessment of the effectiveness of the OU2 remedies will be conducted under a five-year review that is required for any of the Operable Units where wastes have been left in place.

Work at the Malta Gulch Tailings Impoundment did not address all the actions identified in the September 10, 1993 Action Memorandum

The Proposed Action section of the September 10, 1993 Action Memorandum identified the following actions to mitigate the potential release and subsequent threats to health and environment: a) Consolidation of the tailings: EPA response contractors consolidated tailing and high metal soils found outside the impoundments into tailings impoundments 2 and 3; b) Regrade and reclaim the disturbed areas: EPA response contractors regraded all disturbed area to assure adequate storm water management and the disturbed areas were revegetated; c) Regrade and reclaim tailings impoundments, including the retention of the existing structures where appropriate: After consolidating tailings and soils outside of the impoundments into the impoundment, the impoundments were regraded to assure proper drainage and the areas were revegetated. Tailings located in the retention pounds were also consolidated in the impoundment; d) Install a single layer cap: After consolidation of tailings and high metal soils into the impoundment, a single layer cap was placed over the newly placed material as well as existing areas where tailings were exposed to the surface; e) Provide for long-term maintenance and monitoring. As discussed in the Record of Decision, periodic monitoring will be necessary to assess whether the remedy is effective and to verify that zoning of the property has not changed. Further, the property is subject to a Colorado Division of Minerals and Geology permit, that also requires long-term monitoring of the property.

EPA conducted an investigation of the stability of the tailings embankment and found failures in the north embankments along ponds 2 & 3. A total of 6,800 cubic yards of soil was compacted in the new 2:1 slopes in addition to the 2,033 cubic yards of original slope material that was recompacted in place. A rip-rap spillway was then constructed to improve run-off conditions from the impoundments. The embankments were then successfully revegetated. These actions have adequately addressed the stability of the impoundments and as discussed above periodic monitoring will continue to assure that the stability is maintained.

Dolomite rock from the Sherman Mine was used for cover material at the site and laboratory analysis of 10 samples confirmed that lead was found to be between 16 mg/kg to 5,840 mg/kg in 9 of the samples with one sample having 23,900 mg/kg, for an average of 5000 mg/kg for all 10 samples. This is well below the 6,700 mg/kg for lead that was established in the human health risk assessment for commercial and industrial workers that would be consistent with current land uses and zoning. The dolomite has a high amount of available calcium carbonate making the metals low in availability and will immobilize metal migration minimizing infiltration into the groundwater.

Erosion Stability of the Lower Malta Gulch (Evaluation of stream channel during floods)

Drainage within lower Malta Gulch where the fluvial tailings were removed does not flow within an existing channel, but fans out covering the entire gulch. Accordingly, the area was successfully revegetated and graded to maintain a stable condition during the maximum probable precipitation event and run-off and access control berms were placed in coordination with the property owner.

Malta Tailings Impoundment (Revegetation status and pyrite disposal)

The revegetation of the Malta Tailings Impoundment was done according to the Malta Gulch Revegetation Statement of Work and included incorporating 10 tons/acre of limestone. The vegetation has been established for three growing seasons and is successful.

Pyrite concentrates from the Apache Energy and Minerals property were consolidated into the impoundment prior to placement of the soil cap. The tailings in the impoundment were from the Leadville Silver and Gold Mill that also produced a pyrite concentrate and thus the material from the Apache Energy and Minerals site was chemically and physically the same as the existing tailings. Less than 1,000 cubic yards of Apache concentrates were consolidated into the Malta Tailings Impoundment.

Specific Comment No. 1 (Incorrect OU Boundaries)

The Operable Unit boundary map from the Consent Decree has been incorporated into the ROD showing the correct OU boundaries.

Specific Comment No. 2 (Additional Disposal in Malta Gulch Tailings Impoundment)

The disposal of additional material from OU2 or any other Operable Units is not being considered at this time. However, use of this site for disposal in the future is not being ruled out.

Specific Comment No. 3 (Final Closure)

As stated in the Record of Decision, as long as the present zoning, Industrial Mining, or similar zoning that does not allow residential use is maintained, no further response actions are necessary. Thus, local zoning will have to be considered for all long-term land uses for the site.

Specific Comment No. 4 (Ground water concern)

Resurrection as a party to the Site-wide Consent Decree dated May 17, 1994, agreed that decisions on remediation of surface and ground water would be made only after records of decision for source remediation were selected and implemented at each operable unit. If additional response actions are necessary to meet surface or ground water requirements, those actions will be designated in the Record of Decision for Operable Unit 12.

Specific Comment No. 5 (Ground water monitoring)

The specific program for monitoring site-wide ground water which will include OU2 will be developed in the future.

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