

Ms. Wendy Naugle
Colorado Department of Public Health and Environment
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Mr. Michael Holmes
EPA Region VIII
Superfund Program
8EPR-SR
1595 Wynkoop
Denver, Colorado 80202-1129

Remediation Feasibility Study

Bolts Lake Area and Areas within OU-1 of the Eagle Mine Site

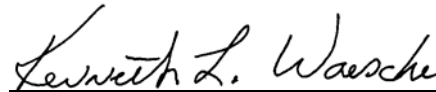
February 16, 2007



Andrea Resch Gardiner, P.E.
Staff Engineer



Curtis L. Dominicak, P.E.
Senior Project Manager



Kenneth L. Waesche, P.G.
Principal

Environmental Resources Management
6455 South Yosemite Street, Suite 900
Greenwood Village, Colorado 80111
(303) 741-5050
Fax: (303) 773-2624

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	SITE BACKGROUND AND HISTORY	3
1.1.1	<i>North Property Layout</i>	3
1.1.2	<i>Eagle Mine Historical Mining Activities</i>	3
1.1.3	<i>Tailings Disposal History</i>	4
1.1.4	<i>Highlands Area and Bolts Lake</i>	6
1.1.5	<i>Regulatory Background</i>	7
1.2	PREVIOUS REMEDIATION ACTIVITIES	11
1.2.1	<i>Consolidated Tailings Pile</i>	14
1.2.2	<i>Old Tailings Pile and Rex Flats</i>	15
1.3	GEOLOGIC SETTING	16
1.4	ERM REMEDIAL INVESTIGATION 2005/2006	17
1.4.1	<i>Soils</i>	17
1.4.2	<i>Surface Water</i>	18
1.4.3	<i>Ground Water</i>	19
1.4.4	<i>Hydraulic Conductivity</i>	21
1.5	SUMMARY OF REMEDIAL INVESTIGATION FINDINGS	22
1.6	SUMMARY OF HUMAN HEALTH RISK ASSESSMENT	25
1.7	NATURE AND EXTENT OF CONTAMINATION	27
1.7.1	<i>Mining Impact</i>	27
1.7.2	<i>Surface Water</i>	28
1.7.3	<i>Soil</i>	29
1.7.4	<i>Ground Water, Seeps and Trenches</i>	35
2.0	DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES AND GENERAL RESPONSE ACTIONS	36
2.1	APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)	37
2.1.1	<i>Chemical-Specific ARARs</i>	39
2.1.2	<i>Location-Specific ARARs</i>	39
2.1.3	<i>Action-Specific ARARs</i>	39
2.1.4	<i>To Be Considered Information</i>	39
2.2	MEDIA AND CHEMICALS OF CONCERN	40
2.2.1	<i>Media of Concern</i>	40
2.2.2	<i>Chemicals of Concern</i>	40

2.3	FUTURE LAND USE CONSIDERATIONS	41
2.4	REMEDIAL ACTION OBJECTIVES	42
2.4.1	<i>ARAR Compliance</i>	43
2.4.2	<i>Human Health Risks</i>	43
2.4.3	<i>Surface Water Quality</i>	44
2.4.4	<i>Existing Remedial Features of OU-1</i>	45
2.5	PRELIMINARY REMEDIATION GOALS	45
2.6	STATISTICAL BACKGROUND CONCENTRATIONS	47
2.7	GENERAL SOIL SCREENING LEVELS	47
2.8	IDENTIFICATION AND SCREENING OF TECHNOLOGY TYPES AND PROCESS OPTIONS	48
2.8.1	<i>Objective</i>	48
2.8.2	<i>Identification of Technologies</i>	49
2.8.3	<i>No Action</i>	50
2.8.4	<i>Containment Technologies</i>	50
2.8.5	<i>Excavation Technologies</i>	51
2.8.6	<i>Solids Treatment Technologies</i>	51
2.8.7	<i>Water Management Technologies</i>	51
2.8.8	<i>Water Treatment and Discharge Technologies</i>	52
2.8.9	<i>Demolition and Debris Treatment Technologies</i>	52
2.8.10	<i>Institutional Controls and Monitoring</i>	52
3.0	DEVELOPMENT AND SCREENING OF ALTERNATIVES	54
3.1	IDENTIFYING REMEDIAL TECHNOLOGIES	54
3.1.1	<i>Identifying Potential Remedial Technologies</i>	54
3.1.2	<i>Identifying Screening Criteria</i>	55
3.2	SUMMARY OF REMEDIAL ACTION OBJECTIVES	57
3.3	DETAILED SCREENING PROCESS	57
3.4	GENERAL RESPONSE ACTION SCREENING	57
3.4.1	<i>No Action</i>	58
3.4.2	<i>Containment Technologies</i>	59
3.4.3	<i>Excavation Technologies</i>	63
3.4.4	<i>Solids Treatment Technologies</i>	65
3.4.5	<i>Water Management Technologies</i>	68
3.4.6	<i>Water Treatment Technologies</i>	70
3.4.7	<i>Demolition/Treatment Activities</i>	75
3.4.8	<i>Institutional Controls and Monitoring</i>	78

3.5	INDIVIDUAL ANALYSIS OF REMEDIAL ALTERNATIVES	80
4.0	DETAILED ANALYSIS OF REMEDIAL ALTERNATIVES	82
4.1.1	<i>Detailed Analysis Criteria</i>	83
4.1.2	<i>Alternatives to be Retained</i>	85
4.2	CONTINGENCY REMEDIAL ACTION PLAN	88
4.3	ALTERNATIVE 1 - NO ACTION	88
4.3.1	<i>Short-Term Effectiveness</i>	89
4.3.2	<i>Long-Term Effectiveness</i>	89
4.3.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	89
4.3.4	<i>Implementability</i>	89
4.3.5	<i>Compliance with ARARs</i>	90
4.3.6	<i>Overall Protection of Human Health and the Environment</i>	90
4.3.7	<i>Cost</i>	90
4.4	ALTERNATIVE 2 - SELECTED EXCAVATION/GRADING/SOIL COVER WITH CONCRETE CAP	90
4.4.1	<i>Short-Term Effectiveness</i>	91
4.4.2	<i>Long-Term Effectiveness</i>	92
4.4.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	92
4.4.4	<i>Implementability</i>	93
4.4.5	<i>Compliance with ARARs</i>	93
4.4.6	<i>Overall Protection of Human Health and the Environment</i>	93
4.4.7	<i>Cost</i>	94
4.5	ALTERNATIVE 3 - SELECTED EXCAVATION/GRADING/ET COVER	95
4.5.1	<i>Short-Term Effectiveness</i>	101
4.5.2	<i>Long-Term Effectiveness</i>	101
4.5.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	102
4.5.4	<i>Implementability</i>	102
4.5.5	<i>Compliance with ARARs</i>	103
4.5.6	<i>Overall Protection of Human Health and the Environment</i>	103
4.5.7	<i>Cost</i>	104
4.6	ALTERNATIVE 4: SELECTED EXCAVATION/GRADING/SOIL COVERS WITH MEMBRANE LINER	104
4.6.1	<i>Short-Term Effectiveness</i>	106
4.6.2	<i>Long-Term Effectiveness</i>	106
4.6.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	107
4.6.4	<i>Implementability</i>	108
4.6.5	<i>Compliance with ARARs</i>	108
4.6.6	<i>Overall Protection of Human Health and the Environment</i>	109
4.6.7	<i>Cost</i>	110

4.7	ALTERNATIVE 5: SELECTED EXCAVATION/GRADING/RESERVOIR COMPLEX LINER/INTERCEPTOR TRENCH/WATER TREATMENT	110
4.7.1	<i>Short-Term Effectiveness</i>	112
4.7.2	<i>Long-Term Effectiveness</i>	113
4.7.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	114
4.7.4	<i>Implementability</i>	114
4.7.5	<i>Compliance with ARARs</i>	114
4.7.6	<i>Overall Protection of Human Health and the Environment</i>	115
4.7.7	<i>Cost</i>	116
4.8	ALTERNATIVE 6: SELECTED EXCAVATION/GRADING/RESERVOIR COMPLEX LINER/LEAK DETECTION SYSTEM	116
4.8.1	<i>Short-Term Effectiveness</i>	118
4.8.2	<i>Long-Term Effectiveness</i>	118
4.8.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	119
4.8.4	<i>Implementability</i>	119
4.8.5	<i>Compliance with ARARs</i>	119
4.8.6	<i>Overall Protection of Human Health and the Environment</i>	120
4.8.7	<i>Cost</i>	121
4.9	ALTERNATIVE 7: INTERCEPTOR TRENCH/WATER TREATMENT SYSTEM	121
4.9.1	<i>Short-Term Effectiveness</i>	122
4.9.2	<i>Long-Term Effectiveness</i>	123
4.9.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	124
4.9.4	<i>Implementability</i>	124
4.9.5	<i>Compliance with ARARs</i>	124
4.9.6	<i>Overall Protection of Human Health and the Environment</i>	124
4.9.7	<i>Cost</i>	125
4.10	ALTERNATIVE 8: DEMOLITION OF STRUCTURES	126
4.10.1	<i>Short-Term Effectiveness</i>	127
4.10.2	<i>Long-Term Effectiveness</i>	128
4.10.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	128
4.10.4	<i>Implementability</i>	128
4.10.5	<i>Compliance with ARARs</i>	128
4.10.6	<i>Overall Protection of Human Health and the Environment</i>	129
4.10.7	<i>Cost</i>	130
4.11	ALTERNATIVE 9: INSTITUTIONAL CONTROLS AND MONITORING	130
4.11.1	<i>Short-Term Effectiveness</i>	130
4.11.2	<i>Long-Term Effectiveness</i>	131
4.11.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	131
4.11.4	<i>Implementability</i>	131
4.11.5	<i>Compliance with ARARs</i>	131
4.11.6	<i>Overall Protection of Human Health and the Environment</i>	132
4.11.7	<i>Cost</i>	132

4.12	COMPARATIVE EVALUATION OF ALTERNATIVES	133
4.12.1	<i>Short-Term Effectiveness</i>	133
4.12.2	<i>Long-Term Effectiveness</i>	135
4.12.3	<i>Reduction of Toxicity, Mobility, or Volume</i>	136
4.12.4	<i>Implementability</i>	136
4.12.5	<i>Compliance with ARARs</i>	138
4.12.6	<i>Overall Protection of Human Health and the Environment</i>	139
4.12.7	<i>Cost</i>	139
5.0	LOCATION-SPECIFIC REMEDIAL ALTERNATIVES	141
5.1	CONSOLIDATED TAILINGS PILE (CTP)	141
5.1.1	<i>General Site Characteristics</i>	141
5.1.2	<i>Selected Remedial Alternatives</i>	142
5.1.3	<i>Preferred Remedy for the CTP</i>	147
5.2	BOLTS LAKE	149
5.2.1	<i>General Site Characteristics</i>	149
5.2.2	<i>Selected Remedial Alternatives</i>	150
5.2.3	<i>Preferred Remedy for Bolts Lake</i>	152
5.3	MALOIT PARK	153
5.3.1	<i>General Site Characteristics</i>	153
5.3.2	<i>Selected Remedial Alternatives</i>	155
5.3.3	<i>Preferred Remedy for Maloit Park</i>	157
5.4	OLD TAILING PILE (OTP)	159
5.4.1	<i>General Site Characteristics</i>	159
5.4.2	<i>Selected Remedial Alternatives</i>	160
5.4.3	<i>Preferred Remedy for the OTP</i>	170
5.5	HIGHLANDS AREA	174
5.5.1	<i>General Site Characteristics</i>	174
5.5.2	<i>Selected Remedial Alternatives</i>	175
5.5.3	<i>Preferred Remedy for the Highlands Area</i>	178
5.6	REX FLATS	181
5.6.1	<i>General Site Characteristics</i>	181
5.6.2	<i>Selected Remedial Alternatives</i>	181
5.6.3	<i>Preferred Remedy for Rex Flats</i>	188
5.7	ROASTER PILE #5	190
5.7.1	<i>General Site Characteristics</i>	190
5.7.2	<i>Selected Remedial Alternatives</i>	191
5.7.3	<i>Preferred Remedy for Roaster Pile #5</i>	192
5.8	PREFERRED REMEDY SUMMARY	193

LIST OF TABLES

Table 1	<i>Summary of Numerical ARARs</i>
Table 2	<i>General Applicable or Relevant and Appropriate Requirements</i>
Table 3	<i>Remediation Goals for Site Users</i>
Table 4	<i>Summary of Remedial Action Objectives and General Response Actions</i>
Table 5	<i>General Response Action, Technology, and Process Screening</i>
Table 6	<i>Numerical Comparison of Alternatives</i>
Table 7	<i>Summary of Comparative Analysis</i>
Table 8	<i>Detailed Cost for Alternative 1 – No Action</i>
Table 9	<i>Detailed Cost for Alternative 2 – Selected Excavation/Grading/Soil Cover with Concrete Cap</i>
Table 10	<i>Detailed Cost for Alternative 3 – Selected Excavation/Grading/ Evapotranspiration Cover</i>
Table 11	<i>Detailed Cost for Alternative 4 – Selected Excavation/Grading/Soil Cover with Membrane Liner</i>
Table 12	<i>Detailed Cost for Alternative 5 – Selected Excavation/Grading/Reservoir Complex Liner/Interceptor Trench/Water Treatment</i>
Table 13	<i>Detailed Cost for Alternative 6 – Selected Excavation/Grading/ Complex Liner/Leak Detection</i>
Table 14	<i>Detailed Cost for Alternative 7 – Interceptor Trench/Water Treatment System</i>
Table 15	<i>Detailed Cost for Alternative 8 – Demolition of Structures</i>
Table 16	<i>Detailed Cost for Alternative 9 – Institutional Controls and Monitoring</i>
Table 17	<i>Alternative Selection for Land Use Areas</i>

LIST OF FIGURES

Figure 1	<i>North Property Site Features</i>
Figure 2	<i>Surface Water Quality Monitoring Locations, Eagle Mine Project</i>
Figure 3A	<i>Composite Area of Soils Exceeding RG Concentrations</i>
Figure 3B	<i>Area of Ground Water Exceeding Primary State Standards</i>
Figure 4A	<i>Development Plan Overview</i>
Figure 4B	<i>Cap, Liner, and Trench Cross Section Details</i>
Figure 4C	<i>Lift Station Detail and Water Treatment System Flow Diagram</i>
Figure 4D	<i>Development Plan and Eagle River Ordinary High Water Mark</i>
Figure 5	<i>Remediation Alternatives Overview</i>
Figure 6	<i>General Soil Borrow and Repository Locations</i>
Figure 7A	<i>Development Plan at CTP, Maloit Park, and Bolts Lake</i>
Figure 7B	<i>Remediation Alternatives at CTP, Maloit Park, and Bolts Lake</i>
Figure 7C	<i>Remedial Alternatives and Development Plan Overlay – CTP, Maloit Park, and Bolts Lake</i>
Figure 8A	<i>Development Plan at OTP and Highlands</i>
Figure 8B	<i>Remediation Alternatives at OTP and Highlands</i>
Figure 8C	<i>Remedial Alternatives and Development Plan Overlay At OTP and Highlands</i>
Figure 9A	<i>Development Plan at Rex Flats</i>
Figure 9B	<i>Remediation Alternatives at Rex Flats</i>
Figure 9C	<i>Remedial Alternatives and Development Plan Overlay at Rex Flats</i>
Figure 10	<i>Locations of Remedial Alternative Implementation – Roaster Pile #5</i>

LIST OF APPENDICIES

Appendix A *Contaminant of Concern Area Maps*

Appendix B *ET Cover Design Calculations*

LIST OF ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CBS	CBS Operations, Inc.
CCC	Colorado Climate Center
CD	Consent Decree
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
cm/s	centimeters per second
CN	Curve number
COC	Contaminant of Concern
COPC	Chemicals of Potential Concern
CTP	Consolidated Tailings Pile
cy	cubic yards
Eagle Mine Site	Eagle Mine Superfund Site
EPA	United States Environmental Protection Agency
ERM	Environmental Resources Management
ET	Evapotranspiration
FML	Flexible Membrane Liner
FS	Feasibility Study
ft/day	feet per day
FSA	Feasibility Study Addendum
FRTR	Federal Remediation Technologies Roundtable
GCL	Geosynthetic Clay Liner
Ginn Battle North	Ginn Battle North, LLC
gpm	gallons per minute
GRA	General Response Action
HHRA	<i>Human Health Risk Assessment Bolts Lake Parcel, Battle Mountain North, Minturn, Colorado</i>
HDPE	High-density Polyethylene

HMWMD	Colorado Hazardous Materials and Waste Management Division
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Controls
IDW	Investigation Derived Waste
kwh	kilowatt hour
lbs	pounds
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MOA	Memorandum of Agreement
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOV	Notice of Violation
NPL	National Priorities List
NPV	Net Present Value
NTP	New Tailings Pile
NRD	Natural Resources Damages
O&M	Operations and Maintenance
OTP	Old Tailings Pile
OU	Operable Unit
OU-1	Operable Unit 1
OU-1 ROD	Operable Unit 1 Record of Decision
OU-2	Operable Unit 2
OU-3	Operable Unit 3
PPE	Personal Protective Equipment
ppm	parts per million
PRG	Proposed Remediation Goals
PRP	Potentially Responsible Parties
RA	Remedial Action
RAO	Remedial Action Objective
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act

RD/RA	Remedial Design/Remedial Action
RfD	Reference Dose
RG	Remediation Goals
RI	Remedial Investigation
RME	Reasonable Maximum Exposure
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SHPO	State Historic Preservation Officer
SNOTEL	Snowpack Telemetry System
SPLP	Synthetic Precipitation Leaching Procedure
SSL	Soil Screening Levels
SVOC	Semi-volatile Organic Compound
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
TMV	Toxicity, Mobility, or Volume
UGDT	Upgradient Ground Water Diversion Trench
US	United States
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WQCC	Colorado Department of Health Water Quality Control Commission
WQCD	Colorado Water Quality Control Division
WTP	Water Treatment Plant

This Feasibility Study (“FS”) was prepared by Environmental Resources Management, Inc. (“ERM”) on behalf of Ginn Battle North, LLC (“Ginn Battle North”) to evaluate remedial technologies and long-term remedial action alternatives intended to reduce, mitigate and monitor impacts at the parcel known as the “North Property”. The North Property encompasses a portion of the Eagle Mine Superfund Site, (“Eagle Mine Site”), which was designated as a Superfund site and placed on the National Priorities List (“NPL”) in 1986 by the U.S. Environmental Protection Agency (“EPA”), due to the impacts of historical mining activities on the metal concentrations in surface water of the Eagle River. The Eagle Mine Site was once the primary mine in the Battle Mountain district, which now includes abandoned mining and ore processing facilities located along the banks of the Eagle River.

This FS describes the procedures for identifying and screening potentially applicable technologies, selecting and combining these technologies into remedial alternatives, and evaluating and selecting a remedial alternative as the preferred corrective action measure for the North Property. The alternatives evaluated in the FS will provide the basis for the Colorado Department of Health and Environment (“CDPHE”) and EPA to prepare a Proposed Plan and Record of Decision (“ROD”) for remedial actions under Operable Unit 3 (“OU-3”) of the Eagle Mine Site to address the proposed reuse of the Site. The FS was prepared in accordance with Comprehensive Environmental, Response, Compensation, and Liability Act (“CERCLA”) guidelines and standards.

Nine remedial alternatives, utilizing various remedial technologies and construction techniques evaluated in this FS, were developed to address the impacts at the North Property. These alternatives include:

- Alternative 1 - No Action;
- Alternative 2 - Selected Excavation/Grading/Soil Cover with Concrete Cap;
- Alternative 3 - Selected Excavation/Grading/Evapotranspiration (“ET”) Cover;
- Alternative 4 - Selected Excavation/Grading/Soil Cover with Membrane Liner;
- Alternative 5 - Selected Excavation/Grading/Reservoir Complex Liner/Interceptor Trench/Water Treatment;

- Alternative 6 – Selected Excavation/Grading/ Complex Liner/Leak Detection;
- Alternative 7 – Interceptor Trench/Water Treatment System;
- Alternative 8 – Demolition of Structures; and
- Alternative 9 – Institutional Controls and Monitoring.

Each of these alternatives along with combinations of various alternatives were evaluated and selected to address impacts within each of the North Property areas of concern. No one alternative was selected to address the impacts for the entire North Property.

In addition to this FS, ERM and Terra Technologies completed a Human Health Risk Assessment (*Human Health Risk Assessment, Bolts Lake Area and Areas within OU-1 of Eagle Mine Site*) dated February 2007 (“HHRA”) (ERM, 2007) and ERM prepared a Remedial Investigation Report (*Remedial Investigation Report, Bolts Lake Area and Areas within OU-1 of Eagle Mine Site*) (“RI”) (ERM, 2006) for the North Property. Data collected and evaluated as part of these reports was utilized to develop the various remedial alternatives evaluated in the FS. The HHRA and RI provide detailed discussion of the nature and extent of contamination as well as the effect of site receptors. These reports should be consulted for a detailed evaluation of environmental issues on the North Property.

This FS is presented in six sections. The six sections included in the FS are described below:

- Section 1.0 presents the site background and summarizes the information collected during the RI and Risk Assessment;
- Section 2.0 presents the development of remedial action objectives and general response actions;
- Section 3.0 presents the development and screening of the remedial alternatives;
- Section 4.0 presents a detailed analysis of the remedial alternatives using seven evaluation criteria;
- Section 5.0 evaluates the alternatives for each specific location in the North Property; and
- Section 6.0 provides a summary of the references cited throughout the FS.

1.1 *SITE BACKGROUND AND HISTORY*

1.1.1 *North Property Layout*

The North Property includes the following areas: The Old Tailings Pile (“OTP”), Rex Flats, Maloit Park, Roaster Pile #5, and the Consolidated Tailings Pile (“CTP”) areas, which were part of the Eagle Mine operations. The North Property also includes Bolts Lake, which is located between the CTP and OTP and is currently drained, and the Highlands Area, both of which are immediately adjacent to the Eagle Mine Site features and are part of the remedy enhancement and retrofit measures necessary to meet human health standards. As shown in Figure 1, the North Property includes the following features:

- 1) CTP including the ground water extraction trenches, surface water diversion, the north and south surface water diversion trenches, and the Water Treatment Plant (“WTP”);
- 2) Bolts Lake, which is located between the CTP and OTP;
- 3) Tailings Slurry Pipeline located immediately south of the OTP;
- 4) Highlands Area located immediately west of the OTP;
- 5) Eagle River, which flows northward between the OTP and Rex Flats and which forms the boundary between the OTP and Rex Flats;
- 6) Mine Water Transport Pipeline that is elevated on a wood trestle, and extends north-south through Rex Flats;
- 7) Ground water monitoring system;
- 8) Surface water diversion trenches at the OTP and Highlands Area including Bolts Ditch; and
- 9) Sump #3 area in the OTP.

1.1.2 *Eagle Mine Historical Mining Activities*

The history of the Eagle Mine Site, with respect to the Operable Unit 1 (“OU-1”) area, is summarized below (CDPHE, 2005A) (E-Quest, 1991), (Warren and Pedersen, 2003), (USGS, 1978), (CH2M Hill, 1984), (EPA, 2000A). OU-1 and Operable Unit 2 (“OU-2”) were developed under the EPA’s Feasibility Study Addendum (“FSA”). OU-1 includes the CTP,

OTP, Rex Flats, and Roaster Pile #5 at the Eagle Mine Site. The past investigation and current remediation effort by others focuses on the transport of metals to the Eagle River and to ground water.

The Eagle Mine is situated along the Eagle River approximately 3 miles south of the North Property. Mining activities at the Eagle Mine began in 1879 and continued until 1984. Historically, several mines were operating in this area which were combined to form the Eagle Mine. The primary metals mined included zinc, gold, silver, lead, and copper.

During the early production history of these mines, the silver, lead, and gold ores were initially shipped to smelters in Leadville for processing. Zinc ore milling began at the Eagle Mine near Belden, a railroad siding in the Eagle River Valley, around 1905. The zinc ore was initially processed using magnetic separation and roasting techniques, and later using flotation techniques that produced tailings materials. These tailings were placed within the Eagle Mine Site.

On December 30, 1977, the New Jersey Zinc Company announced permanent closure of zinc mining and milling activities at the Eagle Mine. The underground mill, near Belden, was “partially dismantled and converted to a wastewater treatment plant for acid mine drainage” (CH2M Hill, 1984). Between 1977 and November 1981, intermittent mining continued primarily for silver ore with a reduced work force (Dames and Moore, 1985) (CH2M Hill, 1984). Because of the conversion of the underground mill, milling no longer took place and no tailings were generated, since raw ore was transported offsite for processing after 1977 (CH2M Hill, 1984). After 1977, ore was sold to custom smelters (Dames and Moore, 1985).

From November 1981 to September, 1983, “the mine was on inactive status with a skeleton crew of 15 workers to operate the wastewater treatment facility and to carry out general maintenance” (D’Appolonia, 1983). In September, 1983, Glenn Miller purchased the mine from Gulf & Western and resold a portion of the Eagle Mine Site to Battle Mountain Corporation, a Colorado corporation owned by Thomas Nevis. For about 6 months, Mr. Miller “mined silver ore which was shipped to Leadville for processing” (Dames and Moore, 1985).

1.1.3 *Tailings Disposal History*

Tailings disposal at the Eagle Mine dates back to at least 1914 when the United States Forest Service issued permits to the Eagle Mine “to dump tailings from a (roaster) mill in an 8 acre area above the Eagle River” to the west, in the Roaster Pile drainage at Belden (CH2M Hill, 1984). The

