



BALD BUTTE MINE AND MILLSITE AND GREAT DIVIDE SAND TAILINGS RECLAMATION PROJECTS

Final Construction Completion Report (CCR)



Prepared for:

*Montana Department of Environmental Quality
Abandoned Mine Lands Bureau
1100 North Last Chance Gulch
Helena, Montana 59620*



and

*U.S. Department of Interior
Bureau of Land Management
106 North Parkmont
Butte, Montana 59701*



April 5, 2013

Final

**Bald Butte Mine and Millsite
and
Great Divide Sand Tailings
Reclamation Projects**

CONSTRUCTION COMPLETION REPORT (CCR)

Prepared for:

*Montana Department of Environmental Quality
Abandoned Mine Lands Bureau
1100 North Last Chance Gulch
Helena, Montana 59620*

and

*U.S. Department of Interior
Bureau of Land Management
106 North Parkmont
Butte, Montana 59701*

Prepared by:

*Pioneer Technical Services, Inc.
201 East Broadway, Suite C
Helena, Montana 59601*

April 5, 2013

LIST OF DOCUMENT REVISIONS

Revision No.	Author	Version	Description	Date
Rev 0	JJM	2010 Draft	Client Review	02/11/11
Rev 1	JJM	2011 Draft	Client Review	02/29/12
Rev 2	JJM	2012 Draft	Client Review	12/21/12
Rev 3	JJM	2012 Final	Final Document	04/05/13

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 PROJECT DESCRIPTION.....	1
1.2 LOCATION AND ACCESS	2
1.3 LAND OWNERSHIP	2
1.4 SITE HISTORY	3
1.4.1 Bald Butte Mine and Millsite.....	3
1.4.2 Great Divide Sand Tailings.....	4
1.5 PROJECT OBJECTIVES	5
2.0 RESPONSIBLE PARTIES	6
2.1 DEQ/AMLB COORDINATION	6
2.2 USDI/BLM COORDINATION.....	6
2.3 CONTRACTOR	6
2.4 RECLAMATION AND ENGINEERING PLANNING	7
2.5 CONSTRUCTION MONITORING AND QUALITY ASSURANCE INSPECTION	8
3.0 CHRONOLOGICAL LISTING OF EVENTS	9
3.1 PRE-BID CONFERENCE.....	9
3.2 BID OPENING	9
3.3 CONTRACT AWARD.....	9
3.4 CONTRACT AGREEMENT	10
3.5 PRE-CONSTRUCTION MEETING	10
3.6 PRE-CONSTRUCTION SUBMITTALS	10
3.7 CONSTRUCTION SUMMARY	11
3.7.1 2010 Construction Season.....	11
3.7.2 2011 Construction Season.....	14
3.7.3 2012 Construction Season.....	16
3.7.4 Major Equipment List	20
3.7.5 Contractor Employees.....	21
3.8 WORK SLOWDOWNS	21
3.9 WORK STOPPAGES.....	21
4.0 CONSTRUCTION ADMINISTRATION	22
4.1 PROJECT OVERSIGHT	22
4.1.1 Project Submittals and Information	22
4.1.2 Quality Assurance.....	22
4.2 PROGRESS MEETINGS	22
4.3 WORK DIRECTIVE CHANGES	23
4.4 CHANGE ORDERS	23
4.5 REQUESTS FOR PAYMENT	25
4.6 PAYROLL APPROVALS.....	27
4.7 SUBSTANTIAL COMPLETION	27
4.8 FINAL PROJECT INSPECTION AND APPROVAL.....	27

5.0	QUANTITIES USED.....	28
5.1	PROJECT SUMMARY	28
6.0	TOTAL PROJECT COSTS.....	34
6.1	ARRA STIMULUS FUNDING	34
6.2	COST SUMMARY.....	34
6.3	FUNDING SOURCES.....	36
7.0	POST CONSTRUCTION	37
7.1	SITE CONDITIONS AFTER COMPLETION	37
7.2	MAINTENANCE AND FOLLOW-UP	38
7.3	AS-BUILT DRAWINGS.....	38
8.0	REFERENCES.....	39

LIST OF TABLES

	<u>Page</u>
Table 1-1: Landowner Contact Information for the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects	3
Table 3-1: Bid Summary for the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects	9
Table 3-2: Equipment Used at the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects	20
Table 5-1: Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects Construction Cost Summary	29
Table 6-1: Analysis of Engineering and Construction Costs for the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects.....	35

LIST OF APPENDICES

(Provided in electronic format except where noted)

Appendix A	Pre-Construction Documentation
	Appendix A-1 Landowner Access Agreements
	Appendix A-2 Pre-Bid Conference Agenda and Notes
	Appendix A-3 Notice of Award
	Appendix A-4 Contract Agreement and Notice to Proceed
	Appendix A-5 Pre-Construction Meeting Agenda and Notes
	Appendix A-6 Pre-Construction Submittals
Appendix B	Construction Daily Activity Reports and Field Notes
Appendix C	Project Submittals and Information
	Appendix C-1 Repository Liner and Leachate System Components
	Appendix C-2 Bald Butte Construction
	Appendix C-3 Great Divide Construction
	Appendix C-4 Delivery Tickets
Appendix D	Laboratory Data
	Appendix D-1 Soil Proctor Results
	Appendix D-2 Repository Compaction Results
	Appendix D-3 Pipe Bedding and Drain Rock Gradations
	Appendix D-4 Repository Liner Test Results
Appendix E	Construction Progress Meeting Minutes

- Appendix F Work Directive Changes**
- Appendix G Change Orders**
- Appendix H Payment Requests**
- Appendix I Payroll Approvals**
- Appendix J Project Completion Certificates**
- Appendix K Site Sampling and Monitoring Well Logs**
 - Appendix K-1 Dog Creek Soils
 - Appendix K-2 Repository Assays
 - Appendix K-3 Monitoring Wells
- Appendix L As-built Drawings (hard copy format)**

LIST OF ACRONYMS AND ABBREVIATIONS

ac	Acres
amsl	Above mean seal level
ARRA	American Recovery and Reinvestment Act of 2009
BMPs	Best Management Practices
CCR	Construction Completion Report
CoCs	Contaminants of Concern
cy	cubic yards
DEQ/AMLB	Montana Department of Environmental Quality/Abandoned Mine Lands Bureau
EEE/CA	Expanded Engineering Evaluation/Cost Analysis
gal	Gallons
GCL	Geosynthetic Clay Liner
GDSC	Great Divide Skiing Company
HAZWOPER	Hazardous Waste Operations and Emergency Response as per OSHA 1910.120
HDPE	High-Density Polyethylene
HMO	Hazardous Mine Opening
JEM	JEM Contracting, Inc., Billings, Montana
LCC	Lewis and Clark County
lf	Linear feet
LLDPE	Linear Low-Density Polyethylene
LS	Lump sum
MOA	Memorandum of Agreement
Olympus	Olympus Technical Services, Inc., Helena, Montana
OSHA	Occupational Safety and Health Administration
Pioneer	Pioneer Technical Services, Inc., Helena, Montana
PVC	Polyvinylchloride
QA	Quality Assurance
RTI	Renewable Technologies, Inc., Butte, Montana
sy	Square yards
TA	Tailings Area
USDA/FS	United States Department of Agriculture/Forest Service
USDI/BLM	United States Department of Interior/Bureau of Land Management
WR	Waste Rock Area

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

The Bald Butte Mine and Millsite and Great Divide Sand Tailings are abandoned hard rock mine sites listed on the Montana Department of Environmental Quality/Abandoned Mine Lands Bureau (DEQ/AMLB) Priority Sites List (DEQ/AMLB-Pioneer, 1995). An Expanded Engineering Evaluation/Cost Analysis (EEE/CA) was conducted for each site, the results of which were published in the *Expanded Engineering Evaluation/Cost Analysis for the Bald Butte Millsite and Devon/Sterling and Albion Mine Sites* (DEQ/AMLB-Olympus, 2004) and the *Draft Final Expanded Engineering Evaluation/Cost Analysis for the Great Divide Sand Tailings* (USDI/BLM-Pioneer, 2007). Addendums to both EEE/CAs were subsequently published as a result of selecting the final repository site (DEQ/AMLB-Olympus, 2008; USDI/BLM-Pioneer, 2009). Pioneer completed design of the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects in April 2010.

Predominant waste sources identified at the Bald Butte Mine and Millsite included mill tailings located within the floodplain of Dog Creek, and waste rock located within and adjacent to the flood plain of an unnamed tributary to Dog Creek. The tailings material originated from the Bald Butte Mill which processed ore from numerous mines located in the surrounding area. The waste rock was mined from the nearby Devon/Sterling and Albion Mines (commonly referred to as the Bald Butte Mines). Contamination from heavy metals, primarily antimony, arsenic, cadmium, copper, lead, manganese, mercury, silver, and zinc, was impacting water and sediment quality in Dog Creek and exposing wildlife and recreationists frequenting the popular site to potential health hazards (Olympus, 2004).

Several Hazardous Mine Openings (HMOs) were also included as part of the Bald Butte reclamation project, and identified as the Larson Shaft, Devon/Sterling Adit, Neenan Shaft, Carbonate Subsidence, and two Dr. Parker shafts (also referred to as the Adams closures).

Waste sources identified at the Great Divide Sand Tailings Site included mill tailings located on a ski slope above the chalet at the Great Divide Ski Area. The tailings originated from the Bald Mountain Mill which was located at the head of Jennie's Fork of Silver Creek. The Department of Interior/Bureau of Land Management (USDI/BLM) capped the tailings with cover soil and revegetated the Site in 1994. Precipitation and runoff from the ski hill in subsequent years caused erosion through the cap into the tailings and carried sediments contaminated primarily with copper, lead, and silver into Jennie's Fork, impacting surface water and sediment quality. Contaminants exposed as a result of erosion were available for potential ingestion by wildlife frequenting the site (Pioneer, 2007).

Thirteen additional HMOs and subsidences associated primarily with the abandoned Bald Mountain and Belmont Mines were discovered during the spring of 2011, presumably as a result of a January 16 earthquake of magnitude 3.8 centered 20 miles northwest of Helena, and exacerbated by saturated ground conditions resultant from higher than normal precipitation that same spring. These mine collapse features subsequently were included with the project to mitigate the associated safety hazards to recreationists and skiers.

Reclamation construction began in July 2010 and was completed in November 2012. This Construction Completion Report (CCR) documents the construction activities.

1.2 LOCATION AND ACCESS

The Bald Butte Mine and Millsite and Great Divide Sand Tailings Sites are located northwest of Helena, accessed by traveling approximately 7 miles north on I-15, 9 miles northwest on Lincoln Road (Highway 279), and 6 miles west along Marysville Road to the town of Marysville. The Great Divide Site is located at the Great Divide Ski Area above the town of Marysville, at the end of Belmont Drive. The Bald Butte Site is accessed by traveling west from Belmont Drive on Ottawa Gulch Road to the head of Ottawa Gulch at the Continental Divide, and following Blossburg Road through the former Bald Butte City site to the project location.

The Bald Butte Millsite and Devon/Sterling and Albion Mines are located in Lewis and Clark County, Montana, within the East ½ of Section 9, Northeast ¼ of Section 10, East ½ of Section 16, and Northeast ¼ of Section 21, Township 11 North Range 6 West of the Montana Principal Meridian. The Bald Butte Millsite is located within the Dog Creek drainage at approximately 6,000 feet above mean sea level (amsl). The Devon/Sterling and Albion Mines are located up gradient from the Bald Butte Millsite at approximately 6,500 feet amsl.

The Great Divide Site is located within the Northeast ¼ of the Southeast ¼ of Section 35, Township 12 North Range 6 West of the Montana Principal Meridian. The Great Divide Sand Tailings were located on the eastern slopes of Mount Belmont, up gradient of the Great Divide Ski Area chalet, at approximately 6,100 feet amsl.

1.3 LAND OWNERSHIP

The project sites are owned by private landowners and the USDI/BLM. Prior to implementing the reclamation projects, DEQ/AMLB entered into access agreements with each of the affected landowners. The access agreements between each landowner can be found in Appendix A. Contact information for the landowners is found in Table 1-1.

Roads accessing the sites (Belmont Drive, Ottawa Gulch Road, and Blossburg Road) are under the jurisdiction of Lewis and Clark County (LCC). A copy of the Memorandum of Agreement (MOA) between DEQ/AMLB and LCC is included in Appendix A.

Sections of roads utilized to access waste materials are under the jurisdiction of the United States Department of Agriculture/Forest Service (USDA/FS). A copy of the letter of concurrence with the USDA/FS is included in Appendix A.

**Table 1-1:
Landowner Contact Information for the
Bald Butte Mine and Millsite and
Great Divide Sand Tailings Reclamation Projects**

Great Divide Sand Tailings:	
U.S. Department of Interior/BLM 106 N. Parkmont Butte, MT 59702 Contact: Dave Williams, Geologist Telephone: (406)533-7655	Great Divide Skiing Co. 7385 Belmont Drive Marysville, MT 59640 Contact: Kevin Taylor, Owner Telephone: (406)449-3746
Bald Butte Millsite:	
Ryan Werner 753 Nicole St. Helena, MT 59601-9700	Springfield Sportsman's Association Attn: Russ and John Carter 102 N.E. 2 nd Boca Raton, FL 33432-3908
Devon/Sterling and Albion Mines:	Dr. Parker Shafts:
Hartmut and Inga Baitis 2705 Lorraine Dr. Missoula, MT 59803-9706	Harold and Barbara Adams 1080 John G. Mine Rd. Helena, MT 59602-8161
Roads:	
Lewis and Clark County Public Works Department 3402 Cooney Drive Helena, MT 59602 Contact: Kyle Thomas, Asst. Director Telephone: (406)447-8034	U.S. Department of Agriculture/FS Helena National Forest 2001 Poplar Street Helena, MT 59601 Contact: Hans Oaks, Geologist Telephone: (406)495-3730
Mine Collapse Features GD-01 through GD-06:	Mine Collapse Features GD-07, 08, 10, 13, 14, 16, 17:
LRG Enterprises Inc. P.O. Box 452 Canyon Creek, MT 59633-0452	Great Divide Skiing Co. 7385 Belmont Drive Marysville, MT 59640

1.4 SITE HISTORY

1.4.1 Bald Butte Mine and Millsite

Operated by a group of Helena businessmen and mine investors, the first production from the Bald Butte Site was reported in 1881 from the Albion Vein. Ore was initially processed in a single stamp mill which was soon replaced by a 10-stamp mill in 1883. Production varied until sometime around 1884 or 1885. After five to six years of dormancy, the Bald Butte Mining Company was formed in 1890 to resurrect operations at the Albion. The mill was expanded to 20-stamps in 1891. In 1894, a 40-stamp mill was constructed at the current Bald Butte Millsite which steadily processed ore from surrounding mines until 1915. From 1915-1923, the majority of production at the site resulted from reprocessing of mill tailings. Idamont Gold Mining Co. reopened the property in 1931, which was subsequently operated by Bald Butte Gold Mines Co.

and then Stratton and Stratton of Wallace, Idaho until 1942. Production included gold, silver, copper, and lead. While records prior to 1902 are sketchy, total production from 1902 to 1942 has been calculated at 167,595 tons of ore, yielding an estimated \$3,500,000 worth of gold and silver (Olympus, 2004).

Tailings reprocessing from 1915 to 1923 was conducted by the Tower and Templeman Leasing Company of Butte, utilizing a 200-ton cyanide plant (likely at the lower end of the tailings ponds, at the Vat Leach area). Further reprocessing began in the summer of 1934, when the Colwell party and Atlas Mines Corporation partnered in leasing the Larson group of claims and constructed a 500-ton flotation mill to reprocess tailings until 1936. Reprocessing resumed in 1938 by J.C. Archibald via a 100-ton cyanide plant reportedly at the same location where the flotation mill had been (likely near the agitator remnants and metal vat tanks that existed in Tailings Area 2 prior to reclamation). Reprocessing operations continued through 1941 (Olympus, 2004).

1.4.2 Great Divide Sand Tailings

Located southwest of the Great Divide Site, the Bald Mountain Mine was founded in 1876 by Thomas Cruse. Production was primarily gold and silver, and was sporadic until the mid to late 1880s. Production resumed in the late 1890s with construction of a 20-stamp mill near the main portal in conjunction with a buried wooden flume to carry tailings approximately three miles northeast into Demijohn Gulch. Full production continued into 1901, with intermittent production for a few years thereafter. Full production resumed in 1909 when the adjacent Belmont Mine was consolidated with the Bald Mountain operation. The 20-stamp mill was remodeled, and a cyanide plant was installed to enhance recoveries. The tailings at the Great Divide Site were thought to have originated from the cyanide plant operation from 1909 to 1915, as one account states the cyanide sand tailings were “impounded on the mountainside north of the mill” as opposed to the prior practice of sluicing to Demijohn Gulch via flume (RTI, 2008).

Beginning in 1916, ownership of the Belmont/Bald Mountain complex was assumed by the Thomas Cruse Mining and Development Company, formed by heirs of the Cruse estate. Numerous lease miners and mining firms leased the complex and attempted production until 1951. The mine was dormant until the early 1980s, when AMAX Exploration Inc. and Gulf Titanium Ltd. attempted to bring the Belmont/Bald Mountain Mine back into production. Cusac Industries Ltd. took sole control of the mine in 1988, but eventually ceased operation in 1990 as a result of limited production. The Montana Mining and Manufacturing Co. made the final attempt at reopening the mine in 1993, but soon abandoned the effort due to difficulties encountered (RTI, 2008).

Organized skiing at the site began in the 1930s with the formation of the Helena Ski Club. The Belmont Ski Area was formally developed in the 1940s and operated until 1986, when the facilities were purchased by the Great Divide Skiing Co. (GDSC). The mining properties encompassing the ski area were leased by GDSC until 1999, when the surface rights were purchased from the Thomas Cruse Mining and Development Company. The tailings were situated on the lower end of the Good Luck ski run on property administered by the USDI/BLM and leased to GDSC. No mining claims appear ever to have been filed on the tailings property (RTI, 2008).

1.5 PROJECT OBJECTIVES

The objectives of the reclamation projects were to reduce human, wildlife, and environmental exposure to the Contaminants of Concern (CoCs), reduce the mobility of the contaminants, and limit the impacts to local surface water and groundwater resources. These objectives were achieved by removing waste sources from within and/or adjacent to the floodplains of Dog Creek, the unnamed tributary, and Jennie's Fork of Silver Creek.

The solid wastes were placed in a fully lined repository centrally located between the Bald Butte and Great Divide Sites. Clean cover soil was placed within the waste excavation areas, and fertilized, seeded and mulched. The Dog Creek and unnamed tributary stream channels were reconstructed within the disturbed areas.

The objective of the HMO closures was to reduce or eliminate the physical safety hazards to the general public that are associated with abandoned mine openings. This was accomplished by placing a locked steel grate over the Neenan shaft and backfilling the remainder of the open and subsided openings that were originally included as part of the Bald Butte reclamation project. Foam plugs with earth backfill were installed in two of the open collapse features later discovered near Great Divide. Seven of the additional features were backfilled and graded to match surrounding topography. New or repaired fencing was installed around features that were impractical to backfill.

2.0 RESPONSIBLE PARTIES

2.1 DEQ/AMLB COORDINATION

Reclamation of the Bald Butte Mine and Millsite was conducted through the DEQ/AMLB.

From September 2003 through December 2008, DEQ/AMLB Project Manager Ben Quiñones was responsible for regulatory oversight of the remedial investigation, EEE/CA, and draft reclamation design. Beginning in January 2009, DEQ/AMLB Project Manager Steve Opp was responsible for regulatory oversight of the final reclamation design and implementation of the construction project.

Montana Department of Environmental Quality/Abandoned Mine Lands Bureau
P.O. Box 200901
Helena, Montana 59620-0901
Telephone: (406)841-5030

2.2 USDI/BLM COORDINATION

Reclamation of the Great Divide Sand Tailings Site was conducted in cooperation with the USDI/BLM. The repository, Neenan Mine shaft, and Carbonate subsidence also are situated on land administered by the USDI/BLM.

From April through December 2006, BLM Project Manager Jodi Kountz was responsible for regulatory oversight of the remedial investigation and draft EEE/CA. From January through September 2007, interim BLM Project Manager Joan Gableman assumed responsibility for regulatory oversight of the project. Beginning in October 2007, BLM Project Manager Corey Meier, was responsible for regulatory oversight of the draft final EEE/CA, reclamation design, and implementation of the construction project through coordination with DEQ/AMLB. Dave Williams managed the project during the 2012 construction season.

U.S. Department of Interior/Bureau of Land Management
106 N. Parkmont
Butte, MT 59702
Telephone: (406)533-7640

2.3 CONTRACTOR

The Contractor responsible for construction of the reclamation projects was JEM Contracting, Inc. (JEM).

JEM Contracting, Inc.
P.O. Box 50807
Billings, MT 59105
Telephone: (406)896-8333

Justin Peterson served as JEM's project manager throughout the project. Matt Stepan served as JEM's office manager during the 2010 and 2011 construction seasons.

Subcontractors utilized by JEM throughout the course of reclamation work include the following:

Repository Lining: Northwest Linings & Geotextile Products, Inc.
21000 77th Ave. S.
Kent, WA 98032
Telephone: (253)872-0244

Fencing: Fence Crafters
3123 East Lyndale
Helena, MT 59601
Telephone: (406)449-4302

Electrical/Communications Utilities: South Hills Electric
1206 South Hills Dr.
Helena, MT 59601
(406)449-4935

Snow Production Waterline Installation: 7K Fabrication & Welding
203 S. 25th St.
Billings, MT 59101
(406)259-7833

Revegetation: McGlone Landscaping
1252 Crystal Lake Ln.
Billings, MT 59105
(406)672-4835

2.4 RECLAMATION AND ENGINEERING PLANNING

Under contract with the DEQ/AMLB, Pioneer was the engineering firm responsible for planning and preparing the final design and specifications for the reclamation projects.

Pioneer Technical Services, Inc.
201 East Broadway, Suite C
Helena, MT 59601
Telephone: (406)457-8252

Tim Ranf, P.E., was the Engineer in Responsible Charge of the projects. Jon Maxwell, Tony Weshe, Pat Sheehy and Marty Bennett assisted as design engineers. Pierre LeMieux assisted with bid document preparation.

2.5 CONSTRUCTION MONITORING AND QUALITY ASSURANCE INSPECTION

Under contract with the DEQ/AMLB, Pioneer also performed construction oversight and quality assurance (QA) inspection for the projects. Oversight Personnel ensured that the Contractor implements the work as specified in the construction bid document and communicate discrepancies to the Engineer, Owner, and Contractor. Jon Maxwell functioned as the full-time, on-site Resident Project Representative for construction oversight, assisted occasionally by Pierre LeMieux or Colt Wise. Cedar Richards served as assistant on-site Resident Project Representative for the 2011 construction season during concurrent reclamation activities at both sites.

3.0 CHRONOLOGICAL LISTING OF EVENTS

3.1 PRE-BID CONFERENCE

A Pre-Bid Conference was held at the Great Divide Ski Area on May 12, 2010 at 9:00 a.m., with a walk-through of each site thereafter. Twenty-nine (29) contractors attended the Pre-Bid Conference. A copy of the Pre-Bid Conference agenda and meeting notes is included in Appendix A.

3.2 BID OPENING

The bid opening for the projects was held on May 27, 2010 at 2:00 p.m. at the DEQ/AMLB office, located at 1100 North Last Chance Gulch in Helena, Montana.

Seven (7) qualified bidders responded with bids ranging from \$4,515,668.62 to \$7,923,714.25, as summarized in Table 3-1. The Engineer's estimate for the combined projects was \$5,382,878.38. The apparent low bid was submitted by JEM Contracting, Inc.

**Table 3-1:
Bid Summary for the Bald Butte Mine and Millsite and
Great Divide Sand Tailings Reclamation Projects**

Bidder	Total Bid
JEM Contracting, Inc. – Billings, MT	\$4,515,668.62
Smith Contracting, Inc. – Butte, MT	\$4,658,782.44
North Wind, Inc. – Kellogg, ID	\$4,698,374.60
(Engineer's Estimate)	\$5,382,878.38
Mungas Company, Inc. – Philipsburg, MT	\$5,767,626.60
Helena Sand and Gravel – Helena, MT	\$6,202,121.00
Shumaker Trucking and Excavating – Great Falls, MT	\$6,491,099.37
N. A. Degerstrom, Inc. – Spokane, WA	\$7,923,714.25

3.3 CONTRACT AWARD

A Pre-Award Conference was held June 3, 2010 at the DEQ/AMLB office with representatives from JEM, DEQ/AMLB, and Pioneer. The JEM bid was discussed, along with their ability to complete the projects on time considering the challenging working and weather conditions at the sites and the schedule constraints of the Great Divide project. JEM affirmed that they could complete the projects for the amount bid, in the time frame specified (313 working days), and that they had adequate personnel and equipment available.

Other items discussed included project approach; sequencing; water use; subcontractors; and American Recovery and Reinvestment Act of 2009 (ARRA) reporting and accountability requirements.

The Notice of Award was sent to JEM by the DEQ/AMLB on June 4, 2010; a copy is included in Appendix A.

3.4 CONTRACT AGREEMENT

The Contract Agreement with JEM became effective on June 7, 2010. The Notice to Proceed was issued on July 1, 2010, with a start date specified no later than July 12, 2010. The Contractor was to complete all work within 313 working days, not including winter shutdown periods and weather days. The work was anticipated to require three construction seasons with a completion date around late August 2012. A copy of the Contract Agreement and Notice to Proceed is included in Appendix A.

3.5 PRE-CONSTRUCTION MEETING

A Pre-Construction Meeting was held at the DEQ/AMLB office on July 1, 2010. A copy of the Pre-Construction agenda and meeting notes is included in Appendix A. The proposed JEM construction schedule and work hours were discussed; JEM stated that their normal work week would consist of five 10- or 12-hour days.

Submittal discussion covered the American Resource and Recovery Act (ARRA) Verification, Health and Safety Plan, Storm Water Erosion Control Plan, Dust Control Plan, Road Improvement Plan, and Fuel Price Adjustment submittal. Other items discussed included submitting Hazardous Waste Operations and Emergency Response (HAZWOPER) training certificates, list of Subcontractor Values, Quality Control Plan, Traffic Control Plan, notification to Lewis and Clark County of construction start-up, and submission of separate pay requests for ARRA-funded bid items. Bi-weekly progress meetings initially were scheduled for every other Wednesday at 9:00 a.m. at the job trailers during the construction season, with a site walk-through after each meeting.

3.6 PRE-CONSTRUCTION SUBMITTALS

With the exception of the Quality Control Plan and Traffic Control Plan, JEM provided the required submittals prior to beginning work as specified at the Pre-Construction Meeting and in the construction bid package. Several revisions to the Health and Safety Plan, Storm Water Erosion Control Plan, Road Improvement Plan, Traffic Control Plan, and Quality Control Plan subsequently were approved after the start of construction. Copies of the Pre-Construction submittals are included in Appendix A.

3.7 CONSTRUCTION SUMMARY

The Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects consisted of the following actions:

- Mobilizing/demobilizing equipment;
- Improving existing access and haul roads;
- Constructing a centrally located mine waste repository;
- Installing temporary stream diversions in the unnamed tributary and Dog Creek drainages;
- Dewatering, excavating, loading, hauling, placing, and compacting 253,665 cubic yards of waste materials in the repository;
- Relocating and/or replacing existing power, communication, and snow production utilities at the Great Divide Site;
- Constructing 1,863 linear feet of storm water runoff control ditches at the Great Divide Site;
- Reconstructing 4,671 linear feet of the Dog Creek and unnamed tributary channels and floodplains;
- Closing 6 existing HMOs;
- Mitigating 13 additional mine collapse features;
- Regrading and applying 60,773 cubic yards of cover soil to the waste excavation areas;
- Revegetating 55 acres of disturbed areas; and
- Fencing the repository and Dog Creek reclamation areas to control access.

Detailed descriptions of the daily construction activities are included in copies of the Construction Daily Activity Reports and field notes in Appendix B. Daily construction photos were taken by Oversight Personnel to document construction activities and are included in the daily reports.

3.7.1 2010 Construction Season

The objective of the 2010 construction season was to excavate the repository, install the bottom liner and leachate collection system, divert stream channels, dewater waste materials at the Bald Butte Site, and excavate, haul, and place a minimum of 2 feet of fine-grained tailings over the bottom repository liner prior to winter shutdown. Because of the limited time available, no work was planned at the Great Divide Site until the 2011 construction season.

The 2010 construction season began on July 12, 2010 by applying magnesium chloride dust suppressant to Belmont Drive, from Marysville to the Ottawa Gulch parking area, as required by Lewis and Clark County prior to beginning work. Mobilization of earth-moving equipment followed on July 13, with the majority of equipment on-site by July 16. Office trailers and a 65-kilowatt generator were set up on July 22-23. The primary fleet of dump trucks arrived July 26-30. Occasional mobilization of additional or replacement equipment occurred throughout the duration of the project. Each piece of equipment was inspected for weeds according to USDI/BLM criteria prior to operation.

Road improvement and maintenance of Ottawa Gulch Rd. was initiated on July 15, 2010 and continued periodically throughout the construction season. Improvement was limited to grading the existing road to provide a smooth and stable surface for mobilizing personnel, equipment, and materials to the repository staging area. Straw wattles were placed around existing culvert inlets and outlets, and at several points along the road where storm water runoff could potentially discharge toward the stream.

Repository excavation started on July 16 by stripping and stockpiling topsoil from within the staked footprint. Repository excavation and stockpiling of underlying soils continued until August 19. Excessive rock was encountered while excavating underlying soils near the bottom of the repository, making it difficult to construct a subgrade which would be smooth and free of sharp projections for the liner installation. A screening plant was brought in (via a change order to the contract) to screen the (stockpiled) excavated materials and produce fine grained soils (1-inch minus) to be placed over the rocky subgrade as a liner cushion. Two stockpiles of rock – one with streambed rock (1-inch to 6-inch) and one with rock riprap (6-inch plus) – were also produced during the screening operations to be used as channel armoring. The 1-inch minus material was spread, compacted, and rolled in a 2- to 3-inch thick layer over the entire excavated area to form a cushion layer over the floor of the repository prior to liner installation. Leachate collection system excavation (trench and evaporation ponds) and repository floor preparation was completed by August 25.

Straw wattles were placed around each repository stockpile and below the repository excavation area to control potential migration of sediments off site.

Northwest Linings began laying repository liner materials on August 25 and completed liner installation on September 13. The liner consisted of a 16-ounce geotextile cushion placed over the repository floor, overlain with a 40-mil Linear Low-Density Polyethylene (LLDPE) fusion-welded impermeable membrane, and covered by a geocomposite drainage layer. Leachate collection piping consisted of perforated Schedule 40 Polyvinylchloride (PVC) pipe bedded in 1.5-inch minus drain aggregate. Solid wall Schedule 40 PVC pipe was installed from the perforated collection pipe to each of the two evaporation ponds. The two evaporation ponds were lined with Geosynthetic Clay Liner (GCL) by Northwest Linings. The GCL was covered with a minimum of 12 inches of cover soil. Overflow spillways were added at each pond due to concerns of overflow from rainfall runoff from the repository. Stockpiled streambed rock (1-inch to 6-inch size) was placed as an apron beneath the pipe outlet in each pond and as armoring for the overflow spillways.

Fencing along the west, south, and east side of the repository area was installed by Fence Crafters September 7- 16, 2010.

Backfilling of the two Dr. Parker (Adams) HMOs was completed on August 24, 2010. The west Dr. Parker shaft opening was backfilled with surrounding rock and soil. The east Dr. Parker opening was backfilled with oversized rock produced during repository stockpile screening, and topped with general backfill material obtained from soils stockpiled at the repository site. The

Carbonate subsidence was backfilled on September 3 with soils obtained from the repository stockpile, leaving a depression for historic identification as requested by USDI/BLM.

Stream channel diversion and waste material dewatering was initiated on August 17, 2010 with the excavation of the unnamed tributary diversion pipe trench and the installation of a 12-inch High-Density Polyethylene (HDPE) diversion pipeline. Dewatering and diversion channel construction in the Dog Creek drainage began on September 7 and was completed by September 16. Dewatering of Tailings Area 1 (TA-1) initially utilized a 4-inch diesel pump drawing from the historic well house until temporary dewatering trenches later were excavated across TA-1 and extended through TA-2. A combination of pumping and gravity dewatering was utilized throughout the duration of the 2010 season. Sediment ponds were constructed at the lower ends of the east dewatering channel and TA-2 dewatering trench to collect sediment prior to discharge to Dog Creek. A series of stone check dams later were added in the TA-2 dewatering trench to control sediment migration during dewatering and spring runoff.

Road improvement along Blossburg Rd. and haul roads within the Baitis properties began on August 31, 2010 and continued until September 20, when the first loads of dry tailings were hauled to the repository from TA-1. Improvements to Blossburg Rd. involved general grading of the existing road surface, repairing a culvert, adding road surfacing aggregate on soft areas near the Bald Butte Town site, and treatment with magnesium chloride dust suppressant. The Baitis haul roads and switchbacks were graded and treated with magnesium chloride. The lowest switchback was extended and tied into an existing two-track road that was improved for access to the Bald Butte tailings. A new temporary haul road was constructed through the bottom of the unnamed tributary, from just below the Bald Butte Town site to the lower Baitis bypass road. Temporary haul roads were built across TA-1 as necessary to access tailings for load-out. Haul roads were maintained by grading and occasional application of water throughout the duration of haul operations. Silt fence was installed along the down-gradient side of the unnamed tributary haul road to control potential sediment migration into the native stream channel. A sediment pond also was excavated at the lower end of the unnamed tributary to collect sediment from runoff and dewatering prior to discharge.

Hauling from TA-1 continued until November 4, 2010, when the objective of 100% repository coverage with a minimum 2-foot thick layer of tailings (approximately 34,000 cy) was met. Compaction in certain areas of the repository proved difficult to achieve due to the saturated nature of some of the tailings; adequate compaction was reached after tilling the placed tailings with a disk implement towed by a dozer, and recompacting.

Final preparations for winter shutdown were made during the week of November 8, which included temporary seeding of stockpiles, re-diversion of the unnamed tributary stream into its original channel, final BMP implementation and repair, general site cleanup, and cleaning and de-mobilizing of selected equipment. An acrylic resin interim cover was applied to the surface of the tailings in the repository on November 11, the final day of the 2010 construction season.

3.7.2 2011 Construction Season

The objective of the 2011 construction season was to complete all work at the Great Divide Site (by October 1) and continue to excavate, haul, and place as much waste as practicable in the repository from the Bald Butte Site prior to winter shutdown, to ensure that remaining work could be completed during the 2012 season.

The 2011 construction season began on April 6 by plowing snow off Ottawa Gulch Road. Access to the repository was cleared by April 8; snow plowing continued at the repository staging area, along Blossburg Road and through the Baitis haul roads, until April 19. Haul road improvements – consisting of grading road surfaces, shaping ditches, and placing surfacing aggregate in soft areas – continued throughout the site until May 3. Snow was cleared from the Great Divide tailings area May 3 - 11 in an attempt to accelerate spring thaw and dry the waste material in preparation for excavation and hauling.

The first loads of waste rock from the Devon/Sterling mine were hauled on May 4, 2011 and placed at the repository. Hauling from the Devon/Sterling continued until May 19, when a series of wet weather days persisted and prevented further work.

Work resumed on June 13, 2011 at the Great Divide Site by leveling remaining snow piles and beginning improvements to the Jennie's Fork access road. Qwest Communications re-routed a temporary telephone line around the excavation area on June 14. Tailings excavation and stockpiling on the ski slope began on June 15 while final road improvements to site access roads and Ottawa Gulch Road were completed. To accommodate haul truck access, ramps were constructed below the Jennie's Fork switch back and uphill of the lower road near the ski chalet, utilizing excess rock material from the repository stockpile. Magnesium chloride dust suppressant was applied to Ottawa Gulch Road and the upper end of Belmont Drive on June 20 as part of final preparation for haul operations.

Tailings removal from the Great Divide ski slope began on June 21, 2011. Tailings excavation and structural backfill around Ski Towers 5 and 6 was completed according to plan and without incident. Backhauling and stockpiling of cover soil on the ski slope from repository stockpile R-1 began July 12 and concluded in conjunction with tailings removal on July 19. Tailings removal and placement of surfacing aggregate on the parking lot tiers were completed the following two days. A total of 37,775 cy of tailings were removed from the site. Ottawa Gulch Road and Belmont Drive were closed to general public traffic during work hours to prevent unsafe interaction with trucks and equipment while waste material hauling operations were conducted.

A change order was implemented at the conclusion of hauling operations to place a 4-inch lift of surfacing aggregate on Belmont Drive, between the Ottawa Gulch parking area and the entrance to the Great Divide Ski Area, followed by an application of magnesium chloride to bind the newly placed surfacing material and control dust. Another change order also was implemented to install an additional 12-inch HDPE culvert near the south end of the lower parking lot at the

request of the ski area operator to drain a spring and prevent erosion of the newly placed parking lot surfacing.

Utility replacement work at Great Divide began on July 26, 2011 with the installation of the Northwestern Energy 2400v power main across the upper slope. Qwest followed on August 4 with the installation of the new telephone line across the northern edge of the excavated area. Installation of ski area utilities, including slope lighting, snow-production, and tower communications, occurred between August 18 and September 6. Three light pole locations were adjusted at the request of the ski area operator to provide better lighting conditions for the new terrain. An extra hydrant assembly and power pedestal (3A) also were requested and supplied by the ski area operator to be installed with the snow-production system on the north side of the slope. The ski area operator directly compensated the contractor for any additional electrical cable and installation costs associated with the requested utility modifications.

The existing tower communications cable inadvertently was disconnected (cut) prior to excavation at Tower 3 instead of Tower 4 as designated on the construction drawings. A modification was necessary during installation of the replacement cable to accommodate the extra distance without adding more spliced section of cable. The solution as proposed by the ski area operator was to install the replacement cable from Tower 3 to a new junction box on the existing light pole located downhill of Tower 7, and re-route a segment of the existing cable below Tower 7 to the new junction box. The resulting installation met the intent of the design, utilizing a continuous run of replacement cable with only two splices, one on each end.

The upper and lower roads and drainage ditches at Great Divide were constructed while utility installation was taking place. Slight adjustments to proposed ditch alignments were necessary to maintain a minimum 2% grade based on the final excavated surface. Because excess rock was available from screening operations at the repository, riprap was substituted in segments of ditches originally proposed for grass lining. While excavating for the middle ditch energy dissipator, a buried French drain/drop inlet configuration was encountered rather than an expected underground pipe from the existing gabion ditch leading to the culvert crossing beneath Jennie's Fork access road. As a result of the discovery, a simple modification was made by raising the existing drop inlet pipe approximately 24 inches to extend into the down-gradient end of the energy dissipator and installing an inlet protection grate. A grouted riprap ditch was constructed to route runoff from the end of the existing gabion ditch to the energy dissipator.

Roads were constructed in general accordance with design; however, the upper road was not in-sloped along its entire length due to lack of suitable on-site fill material and the request of the ski area operator to minimize ground variance that would adversely affect skiable terrain.

Spreading of cover soil stockpiled on the ski slope began on August 31, 2011 and was completed by September 9. Seeding was conducted September 14- 15, followed by installation of erosion control mat. All work at the Great Divide site was completed by September 29.

Work concurrent with Great Divide construction resumed at the Bald Butte site on July 27, 2011 by excavating and hauling tailings from the lower end of TA-1 and east side of TA-2. An additional application of magnesium chloride was applied to the Blossburg and Baitis haul roads

to control dust; haul roads were graded periodically and water applied throughout haul operations to maintain smooth roads and regenerate the dust suppressant. Wet tailings placed in the repository were tilled with an implement disk to promote drying and achieve adequate compaction. The tailings haul continued until August 25.

On August 30, 2011 operations switched to haul remaining waste rock from the Devon/Sterling mine and begin hauling from the Albion mine. The objective was to place a more durable waste rock lift on the surface of the repository in preparation for winter shutdown and provide a relatively solid repository surface when work resumed in the spring. This objective also ensured an adequate volume of tailings would remain available for placement over the waste rock as the final lift prior to installation of the repository cap liner. Waste rock removal from all locations, including the Rose-Densmore and Larson Mines, was completed by October 5. The Larson mine shaft was backfilled with 6-inch oversized rock (riprap) from the repository stockpile and capped with surrounding soil. A mound of waste rock was left in place around the power transmission poles at the Rose-Densmore mine to maintain structural stability.

Foam plugs were installed by DEQ personnel in mine collapse features GD-02 and GD-05 prior to commencing earthwork. Earthwork was initiated on September 13, and ran concurrent with on-going work at Bald Butte until September 26 when backfilling and grading of all associated mine features was completed. Fencing work on features not slated for earthwork began on September 20.

Final preparations for 2011 winter shutdown were made during the week of October 10, which included re-diversion of the unnamed tributary stream into its original channel, general site inspection and cleanup, and cleaning and de-mobilizing of all equipment. An acrylic resin interim cover was applied to the surface of the waste rock in the repository on October 13. The 2011 construction season officially concluded on October 14; however limited fencing work continued at the mine collapse features until November 5, when weather conditions became prohibitive.

3.7.3 2012 Construction Season

The objective of the 2012 season was to complete all remaining work at the Bald Butte Site. Unfinished work included excavation of remaining waste materials, repository closure, stream reconstruction, revegetation, fencing, road reclamation and final maintenance, and closure of remaining mine collapse features.

Work began on June 5, 2012 by preparing access roads at the lower end of TA-1 and TA-2, and grading haul roads from Dog Creek to the repository. Haul road maintenance continued periodically throughout hauling operations. An additional application of magnesium chloride was applied to the haul routes on June 25 to control dust for the remainder of the construction season. Excess rock from the R-4 stockpile was placed at various soft spots that developed in road surfaces. Due to extremely dry conditions, extensive water application was necessary to control dust at the tailings load-out areas and repository and to regenerate the dust suppressant on haul roads.

Tailings removal resumed at the lower end of TA-1 on June 5, 2012 and proceeded through TA-2 until July 16. Work downstream then began by extending the Dog Creek diversion channel along the west side of TA-3 and TA-4, and constructing load-out ramps at several locations off the east access road. Tailings removal resumed on July 17 at the TA-3 dam and continued until July 30 when the upper end of TA-3 was reached. Tailings excavation from TA-4 began on July 31 below the TA-3 dam and concluded on August 13 at the lower end of the project.

Floodplain grading resumed on July 25, 2012 at the lower end of TA-1. Due to mineralized native soils encountered at shallow depths, grading was limited to prevent unnecessary exposure. The mineralized subsoil combined with a relatively steep floodplain grade ultimately prevented reconstruction of the pond near the mouth of Dago Gulch.

Reclamation of the Dog Creek diversion channel along the west side of TA-1 and TA-2 began on August 8, 2012. A temporary diversion channel was excavated to divert stream flow around the east side of TA-1 and into the dewatering channel previously excavated in the TA-2 floodplain. Upon completion of the east diversion, the west diversion was reclaimed by removing residual tailings along the diversion channel, disposing of the PVC liner, and recontouring the channel to blend with the surrounding slopes.

Cover soil application within east TA-2 started on August 8 by loading and spreading soil salvaged from the earthen berm located along the east access road. Hauling of cover soil from the R-2 stockpile at the repository began on August 20. Cover soil was placed on areas remaining in lower TA-1 and west TA-2 and on Larson and Rose Densmore mine sites, and also stockpiled along the access road for stream construction work. No cover soil was applied to upper TA-1; soil that underlain the waste material was deemed suitable for revegetation in place and offset the quantity of cover soil that was not able to be salvaged from tailings dams as originally expected.

Waste rock remaining as part of the unnamed tributary haul road was removed on August 22 - 23, 2012. The waste rock was placed in a reserved area of the repository and capped with tailings in preparation for liner placement. Cover soil also was hauled from the R-2 stockpile and placed within the unnamed tributary floodplain. No cover soil was applied to steep slope areas due to logistical and safety concerns.

Final shaping, grading, and compacting of the repository surface were completed on August 28, 2012, when Northwest Linings arrived on site to begin liner installation. The cap liner consisted of a 40-mil LLDPE fusion-welded impermeable membrane placed over the waste materials and covered by a geocomposite drainage layer. A perimeter drain consisting of perforated Schedule 40 PVC pipe bedded in 1.5-inch minus aggregate was installed in the anchor trench prior to backfilling. Solid wall Schedule 40 PVC outlet pipes were installed at five locations. Liner installation was completed on September 12.

Repository capping involved placing a 1-foot thick layer of 1-inch minus screened material from the R-4 stockpile over the liner surface. An additional 1-foot lift of cover soil obtained from the R-2 stockpile and borrow area was then placed over the first lift, and a storm water control berm

was constructed across the face of the repository with general fill material obtained from the R-4 stockpile. Cap installation was completed on September 25.

Stream construction work commenced on September 10, 2012 within the unnamed tributary drainage. Minor adjustments were made to the design alignment in order to work around bedrock outcrops exposed in the floodplain. Six-inch plus-sized rock riprap obtained from the R-4 stockpile was utilized for channel armoring. The temporary diversion pipe was removed and lower Blossburg Road reopened on September 17.

Stream channel excavation work in Dog Creek began on September 19, 2012. Significant adjustments were made to the original design to account for horizontal and vertical variations in the finished floodplain. Bank construction consisted of 12-inch biodegradable coir logs wrapped in coir fabric. Cover soil was backfilled against the logs and fertilized and seeded with riparian mix prior to completing the fabric wrap. Six-inch minus-sized screened material from the R-4 stockpile was placed as streambed. Six-inch plus-sized rock from the R-4 stockpile was utilized for step-pool construction in conjunction with anchor boulders salvaged during excavation at the Great Divide Site. Brush salvaged during clearing and grubbing was placed in channel pools, anchored beneath the coir logs. A 7-foot wide bottomless arch culvert was installed as part of the reconstructed access road that crosses the stream at the upper end of TA-1. Dog Creek was rediverted into the newly constructed channel on October 19, and all temporary diversion channels were reclaimed.

The landowner requested that slash not be scattered along the east boundary of the TA-1 and TA-2 floodplains as originally planned. Slash was instead scattered within the thinly timbered area located near the upper-east end of TA-1. Cut timber was decked in a small clearing located east of the TA-1 access road.

Steep slopes at the Devon/Sterling and Albion mine sites were hydroseeded/mulched on June 28-29, 2012 in order that the unnamed tributary access road could be utilized prior to its removal during final waste excavation. Seeding resumed within the unnamed tributary floodplain and Dog Creek reclamation areas on September 20, 2012. The unnamed tributary floodplain was hydroseeded/mulched by hand using a portable hose assembly that extended to the drainage bottom from the pump truck. A combination of drill seeding and hydroseeding was employed for the Dog Creek reclamation areas based on slope steepness and appropriate access for equipment. The reclaimed diversion channel along the west side of TA-3 was seeded by hand due to limited equipment access.

Some areas within TA-1 and TA-2 and the repository, borrow, and staging areas were seeded by hydro methods as a result of a drill seeder break down on October 8. Investigation of the equipment breakage revealed that some bags of fertilizer contained rocks which jammed the drill seeder and also damaged the pump in the hydro equipment. Replacement parts for the drill seeder could not be obtained in time to complete work, so hydroseeding was utilized to finish remaining areas. All revegetation work was completed by October 31.

Fencing work around the mine collapse features resumed on July 10, 2012 and concluded on September 7. Installation of the jack-leg and smooth wire fences along the Dog Creek

reclamation areas began on September 12 and was completed on November 1. At the request of the landowner, an additional section of jack-leg fence was constructed west of TA-1 along Dog Creek Road, and a locked gate was installed at the west end of the reconstructed TA-1 access road in order to better protect the reclamation areas. The USDI/BLM also requested installation of a locked gate across an access road leading to the east side of TA-1. Smooth-wire fence was substituted along the east side of TA-3 as a result of installing the additional jack-leg fence along Dog Creek Road.

Final work items for the project included installing five culverts on Ottawa Gulch Road on October 22- 23, 2012. Originally nine culverts were planned; four culvert locations were determined to be unnecessary or redundant as a result of monitoring storm runoff over the course of three seasons. The last HMO closure was completed on October 31 by installing a grate over the Neenan shaft.

Equipment was demobilized and all work was complete as of November 1, 2012.

3.7.4 Major Equipment List

Table 3-2 lists the major pieces of equipment used during construction.

**Table 3-2:
Equipment Used at the Bald Butte Mine and Millsite
and Great Divide Sand Tailings Reclamation Projects**

TYPE	MAKE/MODEL*	SIZE/CAPACITY**
Track Excavator	Deere 350D/330C	2.2-cy bucket
Track Excavator	Hitachi 450/Deere 450C	3.1-cy bucket
Track Excavator	Deere 450D	3.1-cy bucket
Track Excavator	Hitachi 240/Komatsu PC200LC	1.5-cy bucket
Track Skidsteer	Takeuchi TL140	
Wheeled Skidsteer	Case 85XT	
Motor Grader	Caterpillar 772GP/772CH	
Track Bulldozer	Komatsu D61PX/D65PX	
Track Bulldozer	Deere 850J/Komatsu D65WX	
Track Bulldozer	Deere 1050J/1050C	
Single Drum Compactor	Sakai 510/CAT CS-533E	
Double Drum Compactor	I-R DD110/HYPAC C-784	
Double Drum Compactor (mini)	Dynapac CC-122	
Wheeled Loader	Caterpillar 950G	4-cy bucket
Wheeled Loader	Caterpillar 950F	4-cy bucket
On-Road End Dump Trucks (Up to 5)	Freightliner/Kenworth	15 cy
On-Road End Dump Trucks (Up to 6)	Sterling	18 cy
On-Road End Dump Trucks (1)	Kenworth	12 cy
On-Road End Dump Trucks (1)	GMC Topkick	12 cy
Water Truck	Sterling	2,000-gallon
Water Truck	Freightliner	1,500-gallon
Fuel Tanker Truck	Kenworth	4,000-gallon
Fuel Tanker Truck	Ford LN7000	1,000-gallon
Lube-Service Truck	GMC Topkick	
Screen Plant	Extec E7	
Tandem Offset Disk	John Deere	
Tractor w/3-point Drill Seeder	M-F 1250 w/Brillion LS64	
Hydroseed/mulch Truck	International	1,500-gallon

* / - indicates equipment substitution during project.

** cy – cubic yards

3.7.5 Contractor Employees

JEM Contracting utilized up to 18 employees during construction. The majority of the labor involved equipment operators and truck drivers, with the remaining personnel performing supervision, general labor tasks, and mechanical repair as necessary. Typical operation included four to ten truck drivers and four to six equipment operators with one or two supervisory personnel and one full-time mechanic. Northwest Linings utilized up to 12 employees during repository liner installation. Fence Crafters utilized two to three employees during fence construction. South Hills Electric utilized up to four employees during utility installation at Great Divide and 7K Fabrication utilized one employee for snow-production waterline welding. McGlone Landscaping utilized two to three employees for revegetation work.

3.8 WORK SLOWDOWNS

Weather was challenging during the 2010 construction season, with generally cool and wet conditions which inhibited work and accounted for a total of six weather days. Work days lost due to weather included August 13, September 9, October 15, October 25, October 27, and October 28.

The 2011 season initially proved more challenging due to heavy snowpack and wet conditions. A total of 15 weather days were lost, including May 9-10, May 23-26, May 31-June 3, June 7-9, and October 11-12.

The 2012 season was warmer and drier with only four weather days lost on June 6, October 16, and October 25-26.

3.9 WORK STOPPAGES

The winter shutdowns beginning November 11, 2010 and October 14, 2011 were the only work stoppages during construction.

4.0 CONSTRUCTION ADMINISTRATION

4.1 PROJECT OVERSIGHT

Pioneer provided project oversight for the Bald Butte Mine and Millsite and Great Divide Sand Tailings Reclamation Projects. Oversight personnel documented the implementation of the projects in Construction Daily Activity Reports and field notes. Copies of the daily reports and field notes are included in Appendix B.

4.1.1 Project Submittals and Information

The submittal process was ongoing throughout construction. JEM submitted the required materials submittals, plans, and certifications to the Engineer for approval prior to starting an applicable project task. Copies of delivery tickets for materials and supplies were also collected. Copies of the approved construction submittals and other information can be found in Appendix C.

4.1.2 Quality Assurance

During construction activities, it was necessary to perform QA measures to ensure the projects were being implemented as specified in the construction bid document. These QA measures consisted of sampling waste materials for geotechnical parameters (soil Proctors), compaction testing of the waste materials placed in the repository, and sampling of aggregate materials.

Soil testing for QA purposes was performed by Pioneer's Materials Testing Laboratory, located at 2801 N. Roberts in Helena, Montana. Copies of laboratory data sheets for the sampling and testing activities can be found in Appendix D.

Weld seam testing results for repository geomembrane installation were submitted to Pioneer by Northwest Linings during bottom liner installation in 2010 and cap liner installation in 2012. Seam samples were analyzed by TRI/Environmental, Inc. located at 9063 Bee Caves Road in Austin, Texas. Copies of laboratory data sheets for the testing activities can be found in Appendix D.

4.2 PROGRESS MEETINGS

Progress meetings were held at the job trailers located at the repository staging area. The dates of the progress meetings were mutually agreed upon by the Contractor, Owner, and Engineer and were adjusted as necessary to accommodate project requirements and personnel schedules. Pioneer prepared an agenda and conducted each progress meeting. The meetings identified progress made since the prior meeting, scheduling and scope of upcoming work, submittals needed or approved, status of upcoming or pending pay requests, health and safety concerns, past unresolved issues or corrective actions required, and other miscellaneous topics of discussion. Copies of the progress meeting minutes are included in Appendix E.

4.3 WORK DIRECTIVE CHANGES

Five Work Directive Changes were executed during construction which led to corresponding change orders described in the following section. Copies of the executed Work Directive Changes can be found in Appendix F.

4.4 CHANGE ORDERS

Twelve change orders were issued during construction. Copies of the change orders are included in Appendix G. Change Orders 1, 2, and 5 through 12 increased the total contract amount by \$1,062,254.63, resulting in a total adjusted contract price of \$5,577,923.25. Change Orders 2, 5, 6, 7, and 8 added 20 additional days to the original contract time, resulting in a total adjusted contract time of 333 working days.

Change Order #1: Subgrade materials encountered during repository excavation proved too rocky for use in contact with liner materials. Work Directive 1 and Change Order 1 were implemented to instruct JEM to screen an estimated 40,000 cy of stockpiled material to meet a 1-inch minus specification. Approximately 3,500 cy of the screened material was to be placed over the repository subgrade as a cushion layer prior to installation of the bottom liner materials. Screened material was also to be utilized for the lower-most lift of soil cover over the repository cap liner. Oversize rock generated during screening was to be used for stream channel and runoff control ditch armoring in lieu of importing material from off-site. This Change Order added a total of \$78,220.00 to the Contract amount and did not increase the contract time.

Change Order #2: Mr. Hal Adams requested that DEQ/AMLB close two existing abandoned mine openings located on his property near the Bald Butte City location. The openings are referred to as the Dr. Parker HMOs, or Adams closures. Work Directive 2 and Change Order 2 were implemented to instruct JEM to backfill and grade the HMOs as requested by DEQ/AMLB on behalf of Mr. Adams. This Change Order added a total of \$14,685.00 to the Contract amount and increased the Contract time by two additional days.

Change Order #3: JEM requested a change in payment for Bid Item I-2a, Improve and Maintain Roads. The original payment language specified payment at the rate of 10% for each 30-day contract period for the first 70% of the lump sum amount bid. The final 30% of the lump sum amount bid was to be paid upon acceptance of the finished road at the conclusion of the contract. Change Order 3 was implemented to change the payment language so the first 70% of the lump sum bid would be paid upon completion of the initial road improvements as approved by Engineer. The remaining 30% of the lump sum bid would be paid at the rate of 10% at the end of each of the three construction seasons. This change allowed the Contractor to recover a greater portion of costs incurred for road improvement work early in the project. This Change Order did not increase the Contract amount and did not increase the overall Contract time.

Change Order #4: JEM requested a change in payment for Bid Item II-1a, Improve and Maintain Roads. The original payment language specified payment at the rate of 10% for each 30-day contract period for the first 75% of the lump sum amount bid. The final 25% of the lump sum amount bid was to be paid upon acceptance of the finished road at the conclusion of the

contract. Change Order 4 was implemented to change the payment language so the first 80% of the lump sum bid would be paid upon completion of the initial road improvements as approved by Engineer. The remaining 20% of the lump sum bid would be paid upon completion of all work at the Great Divide Site, and acceptance of the final condition of the road by Owner and Engineer. This change allowed the Contractor to recover a greater portion of costs incurred for road improvement work early in the project. This Change Order did not increase the Contract amount and did not increase the overall Contract time.

Change Order #5: Prior to bid-letting, DEQ entered into a Memorandum of Agreement with Lewis and Clark County to resurface a portion of Belmont Drive from the Ottawa Gulch turnoff to the Great Divide Ski Area, including the parking area at the intersection of Ottawa Gulch Road and Belmont Drive. Work Directive 3 and Change Order 5 were implemented at the conclusion of waste hauling operations to instruct JEM to provide, place, and compact 4 inches of ¾-inch minus surfacing aggregate and raise the existing cattle guard footings as specified in the Memorandum of Agreement. This Change Order added a total of \$49,781.00 to the Contract amount and increased the Contract time by two additional days.

Change Order #6: Mr. Kevin Taylor of the Great Divide Skiing Co. requested that DEQ/AMLB install a culvert at the south end of parking lot Tier 4 to drain a spring area and prevent further erosion across the newly resurfaced parking area. Change Order 6 was implemented for installation of 80 linear feet of 12-inch HDPE culvert as requested by DEQ/AMLB on behalf of Mr. Taylor. This Change Order added a total of \$5,500.00 to the Contract amount and increased the Contract time by one additional day.

Change Order #7: Mr. Kevin Taylor of the Great Divide Skiing Co. requested that DEQ/AMLB mitigate mine collapse features discovered during the spring of 2011 at various locations within the ski area that cause potential hazards to skiers and recreationists. Work Directive 4 and Change Order 7 were implemented to instruct JEM to backfill/grade and/or repair and install new fence around the mine collapse features as requested by DEQ/AMLB on behalf of Mr. Taylor. This Change Order added a total of \$167,325.00 to the Contract amount and increased the Contract time by ten additional days.

Change Order #8: Snowmelt runoff at the Great Divide Site during the spring of 2012 eroded an abandoned road on Sunnyside slope and deposited sediment in the Upper Road swale, blocking flow and causing runoff to cascade down the Goodluck slope. The runoff also eroded several areas along the Middle and Lower slope ditches, depositing sediment in and adjacent to the ditches. Work Directive 5 and Change Order 8 were implemented to instruct JEM to repair and stabilize the erosion areas to prevent future runoff from entering the reclaimed area and causing further erosion. This Change Order added a total of \$21,000 to the Contract amount and increased the Contract time by five additional days.

Change Order #9: Prior to bid-letting, DEQ entered into a Memorandum of Agreement with Lewis and Clark County for maintenance of Belmont Drive and Ottawa Gulch Road during construction activities. Change Order 9 was implemented for the final magnesium chloride application during the 2012 construction season to satisfy the terms of the Memorandum of

Agreement. This Change Order added a total of \$2,000.00 to the Contract amount and did not increase the overall Contract time.

Change Order #10: This change order is a continuation of Work Directive 4 and represents repairs and/or installation of new fence around remaining mine collapse features not completed during the 2011 construction season due to winter shut down. This Change Order added a total of \$56,600.00 to the Contract amount and did not increase the overall contract time.

Change Order #11: Additional tailings and waste rock materials were encountered during excavation at the Bald Butte Site, at greater depths and beyond the excavation boundary as specified in the construction bid document. Change Order 11 was implemented to reconcile the final quantities under Bid Item I-9 – Excavate, Haul, Place, and Compact Tailings; and Bid Item I-10 - Excavate, Haul, Place, and Compact Waste Rock in conjunction with Pay Request 15. This Change Order added a total of \$532,802.55 to the Contract amount and did not increase the overall contract time.

Change Order #12: This change order reconciled final contract quantities at the conclusion of the project, and included fuel price adjustments paid in conjunction with Pay Requests No. 1 through No. 16.

Installation of two access control gates requested by the landowner Ryan Werner and by the USDI/BLM was included as part of Change Order 12. The gates were installed to restrict public access to the reclaimed areas along Dog Creek.

Expedited shipping for additional liner cap materials was necessary to close the repository before the end of the 2012 construction season. Costs for the expedited shipping were also included as part of Change Order 12.

This Change Order added a total of \$134,341.08 to the Contract amount and did not increase the overall contract time.

4.5 REQUESTS FOR PAYMENT

JEM issued 16 Requests for Payment during construction. Copies of the Requests for Payment are included in Appendix H.

Pay Request #1: \$319,448.82 earned for work completed from project start-up through August 4, 2010.

Pay Request #2: \$1,039,974.48 earned for work completed from August 5, 2010 through September 13, 2010. This pay request included \$301,681.78 on a Schedule of Material on Site for liner materials delivered but not yet installed on the repository cap and a Fuel Price Adjustment of \$270.51.

Pay Request #3: \$304,407.04 earned for work completed from September 14, 2010 through October 8, 2010. This pay request included a Fuel Price Adjustment of \$2,365.35.

Pay Request #4: \$165,945.84 earned for work completed from October 9, 2010 through November 12, 2010. This pay request included a Fuel Price Adjustment of \$4,366.34, and was the final pay request for the 2010 construction season.

Pay Request #5: \$37,196.67 earned for work completed from April 6, 2011 through April 28, 2011. This pay request included pre-payments to Northwestern Energy of \$28,887.00 and to Qwest of \$3,619.67 for execution of utility relocation agreements at the Great Divide Site.

Pay Request #6: \$186,495.76 earned for work completed from April 29, 2011 through May 31, 2011. This pay request included a Fuel Price Adjustment of \$13,143.06.

Pay Request #7: \$168,126.55 earned for work completed from June 1, 2011 through June 30, 2011. This pay request included a Fuel Price Adjustment of \$9,960.30.

Pay Request #8: \$361,407.80 earned for work completed from July 1, 2011 through July 28, 2011. This pay request included a Fuel Price Adjustment of \$18,112.92.

Pay Request #9: \$494,921.40 earned for work completed from August 1, 2011 through August 31, 2011. This pay request included \$40,464.00 on a Schedule of Material on Site for 36,000 square yards of erosion control mat to be installed at the Great Divide Site and a Fuel Price Adjustment of \$26,273.72.

Pay Request #10: \$446,782.57 earned for work completed from September 1, 2011 through September 30, 2011. This pay request included a Fuel Price Adjustment of \$28,807.56.

Pay Request #11: \$156,671.47 earned for work completed from October 1, 2011 through October 31, 2011. This pay request included \$5,564.00 on a Schedule of Material on Site for 26 linear feet of Eco-Arch culvert delivered for future installation during stream construction work, and a Fuel Price Adjustment of (\$6,570.88) resulting from deductions in actual materials quantities under Bid Items I-9 and I-10 which were previously over-estimated on Pay Requests 9 and 10.

Pay Request #12: \$280,501.82 earned for work completed from June 1, 2012 through June 30, 2012. This pay request included \$30,265.06 on a Schedule of Material on Site for fertilizer, seed, and mulch delivered for revegetation work at the Bald Butte Site, and a Fuel Price Adjustment of \$12,191.80.

Pay Request #13: \$308,992.96 earned for work completed from July 1, 2012 through July 31, 2012. This pay request included \$28,620.00 on a Schedule of Material on Site for coir logs and fabric delivered for stream reconstruction work at the Bald Butte Site and a Fuel Price Adjustment of \$11,226.96.

Pay Request #14: \$341,692.50 earned for work completed from August 1, 2012 through August 31, 2012. This pay request included \$15,577.20 on a Schedule of Material on Site for coir logs

and fabric delivered for stream reconstruction work at the Bald Butte Site and a Fuel Price Adjustment of \$20,578.33.

Pay Request #15: \$464,604.10 earned for work completed from September 1, 2012 through September 30, 2012. This pay request included a Fuel Price Adjustment of \$26,343.04.

Pay Request #16: Final pay request of \$500,753.47 earned for work completed from October 1, 2012 through November 1, 2012. This pay request included a Fuel Price Adjustment of \$5,702.22.

4.6 PAYROLL APPROVALS

Certificates of Compliance were submitted by the Contractor on a weekly basis to verify that all employees (including Subcontractors) performing work on the projects were receiving Montana Prevailing Wage Rates for Heavy Construction (effective February 12, 2010) according to the terms of the construction bid document. Copies of the Payroll Approvals are included in Appendix I.

4.7 SUBSTANTIAL COMPLETION

Substantial completion was reached on September 29, 2011 for the Great Divide Sand Tailings Site. Remaining tasks completed at the end of the 2012 season included replacing culverts (Bid Item II-13b) and final road maintenance (Bid Item II-1a) for Ottawa Gulch Road. A copy of the Certificate of Substantial Completion is included in Appendix J.

4.8 FINAL PROJECT INSPECTION AND APPROVAL

Final completion and acceptance was reached on November 2, 2012 following conclusion of the Bald Butte Mine and Millsite portion of the project. Copies of the Certificate of Completion and Certificate of Acceptance are included in Appendix J.

5.0 QUANTITIES USED

5.1 PROJECT SUMMARY

The 2010-2012 construction seasons consisted of 270 work days beginning on July 12, 2010, and concluding on November 1, 2012, with winter shut downs from November 11, 2010 through April 5, 2011, and October 15, 2011 through June 4, 2012. Table 5-1 summarizes the quantities and construction costs incurred for each pay item as listed on the original bid, plus change order items and fuel price adjustments.

The most significant quantity over-runs (>125% of estimated) resulted from the following work items:

- Bid Item I-2b: 16,551 gallons of magnesium chloride dust suppressant application to roads;
- Bid Item I-5a: 875 lf of Dog Creek diversion channel construction through TA-4;
- Bid Item I-9 and I-10: 72,281 cy of tailings and 16,943 cy of waste rock excavation;
- Bid Item I-11: 8.9 ac of excavated area and floodplain grading;
- Bid Item I-22b: 1,084 lf of smooth wire fence constructed along TA-3; and
- Bid Item II-4a: 720 lf of Type I riprap ditch.

Several significant quantity under-runs (<75% of estimated) were also realized, including:

- Bid Item I-8: 88 tons of debris disposal;
- Bid Item I-14: 8,768 of cover soil excavated from the borrow area;
- Bid Item I-15: 396 tons of cover soil amendment;
- Bid Item I-24a: 1,539 lf of silt fence (Bald Butte);
- Bid Item I-24c: 6,841 sy of erosion control mat;
- Bid Item II-14a: 740 lf of silt fence (Great Divide);
- Bid Item II-14b: 1,450 lf of straw wattles;
- Bid Item II-4b: 90 lf of Type I grouted riprap ditch;
- Bid Item II-4d: 635 lf of grass-lined ditch;
- Bid Item II-9: 1.0 ac of mulch; and
- Bid Item II-13b: 120 lf of culverts.

Detailed descriptions of the circumstances that resulted in the quantity differences for all bid items can be found in the copy of Change Order No. 12 provided in Appendix G.

**Table 5-1:
Bald Butte Mine and Millsite and
Great Divide Sand Tailings Reclamation Projects
Construction Cost Summary**

Bid Item	EST QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE	Units To Date	Cost To Date	Percent Complete	Balance to Bill
			Schedule 1 - Bald Butte Mine and Millsite						
I-1	1	LS	Mobilization, Demobilization, Bonding, and Insurance	\$ 410,000.00	\$ 410,000.00	1	\$ 410,000.00	100.00%	\$ -
			Not to exceed 10% of total Bid						
I-2			Bald Butte Haul Road Improvement and Maintenance						
I-2a	1	LS	Improve and Maintain Roads	\$ 89,500.00	\$ 89,500.00	1	\$ 89,500.00	100.00%	\$ -
I-2b	33547	GAL	Magnesium Chloride Treatment	\$ 0.69	\$ 23,147.43	50098.07	\$ 34,567.67	149.34%	\$ (11,420.24)
I-3			Construct Repository						
I-3a	68439	CY	Excavate and Stockpile Cover Soil and Subsoil	\$ 1.75	\$ 119,768.25	67788	\$ 118,629.00	99.05%	\$ 1,139.25
I-3b	45460	SY	Prepare Subgrade	\$ 0.40	\$ 18,184.00	45811	\$ 18,324.40	100.77%	\$ (140.40)
I-3c	45460	SY	Install Geocushion	\$ 2.75	\$ 125,015.00	45811	\$ 125,980.25	100.77%	\$ (965.25)
I-3d	45460	SY	Install Geomembrane	\$ 3.67	\$ 166,838.20	45811	\$ 168,126.37	100.77%	\$ (1,288.17)
I-3e	45460	SY	Install Geocomposite Drainage Layer	\$ 4.72	\$ 214,571.20	45811	\$ 216,227.92	100.77%	\$ (1,656.72)
I-3f	1	LS	Install Leachate Collection System	\$ 15,900.00	\$ 15,900.00	1	\$ 15,900.00	100.00%	\$ -
I-3g	4704	GAL	Apply Acrylic Resin Cover	\$ 6.80	\$ 31,987.20	4950	\$ 33,660.00	105.23%	\$ (1,672.80)
I-4	1	LS	Install Culvert and Construct New Road	\$ 16,305.00	\$ 16,305.00	1	\$ 16,305.00	100.00%	\$ -
I-5			Construct Diversion and Drainage Channels						
I-5a	2630	LF	Construct Dog Creek Diversion Channel	\$ 14.00	\$ 36,820.00	3505	\$ 49,070.00	133.27%	\$ (12,250.00)
I-5b	1060	LF	Construct Drainage and Dewatering Channel	\$ 15.50	\$ 16,430.00	1060	\$ 16,430.00	100.00%	\$ -
I-5c	1	LS	Construct Sediment Pond	\$ 36,200.00	\$ 36,200.00	1	\$ 36,200.00	100.00%	\$ -
I-5d	1	LS	Construct Unnamed Tributary Diversion System	\$ 30,300.00	\$ 30,300.00	1	\$ 30,300.00	100.00%	\$ -
I-6	1	LS	Dewater Ponds and Excavation Areas	\$ 134,400.00	\$ 134,400.00	1	\$ 134,400.00	100.00%	\$ -
I-7	1	LS	Clear and Grub	\$ 30,000.00	\$ 30,000.00	1	\$ 30,000.00	100.00%	\$ -
I-8	300	Tons	Remove and Dispose Debris	\$ 50.00	\$ 15,000.00	212.02	\$ 10,601.00	70.67%	\$ 4,399.00
I-9	74950	CY	Excavate, Haul, Place, And Compact Tailings	\$ 6.00	\$ 449,700.00	147231	\$ 883,386.00	196.44%	\$ (433,686.00)
I-10	51716	CY	Excavate, Haul, Place, And Compact Waste Rock	\$ 5.85	\$ 302,538.60	68659	\$ 401,655.15	132.76%	\$ (99,116.55)

I-11	16	AC	Grade Excavated Areas And Floodplain	\$ 4,000.00	\$ 64,800.00	24.9	\$ 99,600.00	153.70%	\$ (34,800.00)
I-12			Construct Dog Creek Stream Channel						
I-12a	1582	LF	Channel Run	\$ 26.30	\$ 41,606.60	1522.5	\$ 40,041.75	96.24%	\$ 1,564.85
I-12b	102	LF	Non-Deformable Channel Run	\$ 70.00	\$ 7,140.00	111.2	\$ 7,784.00	109.02%	\$ (644.00)
I-12c	1200	LF	Channel Pool	\$ 27.00	\$ 32,400.00	1197.5	\$ 32,332.50	99.79%	\$ 67.50
I-12d	24	EA	Channel Step	\$ 1,000.00	\$ 24,000.00	22	\$ 22,000.00	91.67%	\$ 2,000.00
I-12e	610	LF	Channel Step Pool	\$ 50.00	\$ 30,500.00	649	\$ 32,450.00	106.39%	\$ (1,950.00)
I-12f	1200	LF	Brush Layer	\$ 10.00	\$ 12,000.00	1197.5	\$ 11,975.00	99.79%	\$ 25.00
I-12g	1	LS	Plant Willow Cuttings	\$ 12,000.00	\$ 12,000.00	1	\$ 12,000.00	100.00%	\$ -
I-12h	1	LS	Plant Shrub Tubelings	\$ 10,000.00	\$ 10,000.00	1	\$ 10,000.00	100.00%	\$ -
I-13			Construct Tributary Channels						
I-13a	1269	LF	Construct Unnamed Tributary Channel	\$ 36.00	\$ 45,684.00	1060	\$ 38,160.00	83.53%	\$ 7,524.00
I-13b	208	LF	Construct Dago Gulch Tributary Channel	\$ 28.00	\$ 5,824.00	170	\$ 4,760.00	81.73%	\$ 1,064.00
I-14	21700	CY	Excavate and Stockpile Borrow Area Cover Soil	\$ 1.75	\$ 37,975.00	12932	\$ 22,631.00	59.59%	\$ 15,344.00
I-15	396	Tons	Amend Cover Soil	\$ 130.00	\$ 51,480.00	0	\$ -	0.00%	\$ 51,480.00
I-16	55394	CY	Load, Haul, Place, And Grade Cover Soil	\$ 3.95	\$ 218,806.30	51238	\$ 202,390.10	92.50%	\$ 16,416.20
I-17	46	AC	Fertilize and Seed	\$ 650.00	\$ 29,900.00	49.4	\$ 32,110.00	107.39%	\$ (2,210.00)
I-18	44	AC	Mulch	\$ 1,400.00	\$ 61,600.00	47.8	\$ 66,920.00	108.64%	\$ (5,320.00)
I-19			Close Repository						
I-19a	45530	SY	Install Geomembrane Liner	\$ 3.58	\$ 162,997.40	47948	\$ 171,653.84	105.31%	\$ (8,656.44)
I-19b	45530	SY	Install Geocomposite Cap Drainage Layer	\$ 4.81	\$ 218,999.30	47948	\$ 230,629.88	105.31%	\$ (11,630.58)
I-19c	1	LS	Construct Perimeter Drain	\$ 54,700.00	\$ 54,700.00	1	\$ 54,700.00	100.00%	\$ -
I-20	3690	LF	Reclaim Diversion And Drainage Channels	\$ 5.00	\$ 55,350.00	4565	\$ 68,475.00	123.71%	\$ (13,125.00)
I-21	1	LS	Reclaim Roads	\$ 27,300.00	\$ 27,300.00	1	\$ 27,300.00	100.00%	\$ -
I-22			Construct Fences						
I-22a	2865	LF	Construct Jack Leg Fence	\$ 15.00	\$ 42,975.00	2478	\$ 37,170.00	86.49%	\$ 5,805.00
I-22b	3490	LF	Construct Smooth Wire Fence	\$ 5.00	\$ 17,450.00	4574	\$ 22,870.00	131.06%	\$ (5,420.00)
I-23			Close Mine Openings						
I-23a	1	LS	Close Neenan Mine Shaft	\$ 5,000.00	\$ 5,000.00	1	\$ 5,000.00	100.00%	\$ -
I-23b	1	LS	Close Larson Mine Shaft	\$ 8,500.00	\$ 8,500.00	1	\$ 8,500.00	100.00%	\$ -
I-23c	1	LS	Close Carbonate Mine Subsidence	\$ 8,000.00	\$ 8,000.00	1	\$ 8,000.00	100.00%	\$ -

I-23d	1	LS	Close Devon/Sterling Mine Adit	\$ 9,500.00	\$ 9,500.00	1	\$ 9,500.00	100.00%	\$ -
I-23e	1	LS	Install Riprap Apron at Albion Mine Adit	\$ 6,500.00	\$ 6,500.00	1	\$ 6,500.00	100.00%	\$ -
I-24			Install Construction BMPs						
I-24a	2200	LF	Install Silt Fence	\$ 2.50	\$ 5,500.00	661	\$ 1,652.50	30.05%	\$ 3,847.50
I-24b	6000	LF	Install Straw Wattles	\$ 2.00	\$ 12,000.00	4593	\$ 9,186.00	76.55%	\$ 2,814.00
I-24c	9712	SY	Install Erosion Control Mat	\$ 2.50	\$ 24,280.00	2870.512	\$ 7,176.28	29.56%	\$ 17,103.72
			Change Orders						
CO-1	40112.82	CY	Screen Existing Stockpiled Materials	\$ 1.95	\$ 78,220.00	39727	\$ 77,467.65	99.04%	\$ 752.35
CO-2	1	LS	Close Adams Mine Shafts	\$ 14,685.00	\$ 14,685.00	1	\$ 14,685.00	100.00%	\$ -
			Additional Mine Closures						
CO-7	1	LS	GD-1	\$ 1,500.00	\$ 1,500.00	1	\$ 1,500.00	100.00%	\$ -
CO-7	1	LS	GD-2	\$ 1,000.00	\$ 1,000.00	1	\$ 1,000.00	100.00%	\$ -
CO-7	1	LS	GD-3	\$ 2,000.00	\$ 2,000.00	1	\$ 2,000.00	100.00%	\$ -
CO-7	1	LS	GD-4	\$ 8,000.00	\$ 8,000.00	1	\$ 8,000.00	100.00%	\$ -
CO-7	1	LS	GD-5	\$ 10,000.00	\$ 10,000.00	1	\$ 10,000.00	100.00%	\$ -
CO-7	1	LS	GD-6	\$ 16,000.00	\$ 16,000.00	1	\$ 16,000.00	100.00%	\$ -
CO-7	1	LS	GD-7	\$ 21,000.00	\$ 21,000.00	1	\$ 21,000.00	100.00%	\$ -
CO-7	1	LS	GD-10	\$ 2,500.00	\$ 2,500.00	1	\$ 2,500.00	100.00%	\$ -
CO-7	1	LS	GD-16	\$ 7,000.00	\$ 7,000.00	1	\$ 7,000.00	100.00%	\$ -
			Additional Fence Closures						
CO-7	1	LS	FGD-8	\$ 17,825.00	\$ 17,825.00	1	\$ 17,825.00	100.00%	\$ -
CO-7	1	LS	FGD-13	\$ 39,100.00	\$ 39,100.00	1	\$ 39,100.00	100.00%	\$ -
CO-7	1	LS	FGD-16	\$ 41,400.00	\$ 41,400.00	1	\$ 41,400.00	100.00%	\$ -
CO-10	1	LS	FGD-14	\$ 12,650.00	\$ 12,650.00	1	\$ 12,650.00	100.00%	\$ -
CO-10	1	LS	FGD-17	\$ 27,600.00	\$ 27,600.00	1	\$ 27,600.00	100.00%	\$ -
CO-10	1	LS	FGD-2	\$ 10,350.00	\$ 10,350.00	1	\$ 10,350.00	100.00%	\$ -
CO-10	1	LS	FGD-3	\$ 6,000.00	\$ 6,000.00	1	\$ 6,000.00	100.00%	\$ -
CO-9	1	LS	Condition Road Surface and Apply Magnesium Chloride	\$ 2,000.00	\$ 2,000.00	1	\$ 2,000.00	100.00%	\$ -
CO-12	1	LS	Dog Creek Access Gates	\$ 2,200.00	\$ 2,200.00	1	\$ 2,200.00	100.00%	\$ -
CO-12	1	LS	Expedited Shipping for Liner Cap Materials	\$ 4,966.00	\$ 4,966.00	1	\$ 4,966.00	100.00%	\$ -
			Subtotal, Bald Butte		\$ 3,953,368.48		\$ 4,467,974.26	113.02%	\$ (514,605.78)

Schedule II - Great Divide Sand Tailings Reclamation Project									
Bid Item	EST QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE	Units To Date	Cost To Date	Percent Complete	Balance to Bill
II-1			Great Divide Haul Road Improvement and Maintenance						
II-1a	1	LS	Improve and Maintain Roads	\$70,000.00	\$70,000.00	1	\$70,000.00	100.00%	\$0.00
II-1b	32,356	GAL	Magnesium Chloride Treatment	\$0.69	\$22,325.64	32,990.95	\$22,763.76	101.96%	(\$438.12)
II-2	39,300	CY	Excavate, Load, Haul, And Place Mine Waste In Repository	\$7.10	\$279,030.00	37,775.00	\$268,202.50	96.12%	\$10,827.50
II-3	1	LS	Excavate And Backfill Around Ski Towers No. 5 And 6	\$23,700.00	\$23,700.00	1.00	\$23,700.00	100.00%	\$0.00
II-5			Relocate Utility Lines						
II-5a	1	LS	Relocate Underground Telephone Cable	\$8,000.00	\$8,000.00	1.00	\$8,000.00	100.00%	\$0.00
II-5b	1	LS	Relocate Underground 2400 V Power Cable	\$40,000.00	\$40,000.00	1.00	\$40,000.00	100.00%	\$0.00
II-6			Replace Utility Lines						
II-6a	800	LF	Replace Water Line (Snow Production System)	\$60.00	\$48,000.00	757.00	\$45,420.00	94.63%	\$2,580.00
II-6b	600	LF	Replace Underground Cable (Snow Production System)	\$19.00	\$11,400.00	647.00	\$12,293.00	107.83%	(\$893.00)
II-6c	3	Each	Replace Light Poles (Slope Lighting)	\$6,000.00	\$18,000.00	3.00	\$18,000.00	100.00%	\$0.00
II-6d	1,100	LF	Replace Underground Cable (Slope Lighting)	\$13.00	\$14,300.00	1,165.00	\$15,145.00	105.91%	(\$845.00)
II-6e	1,100	LF	Replace Underground Cable (Tower Communications)	\$19.00	\$20,900.00	1,142.00	\$21,698.00	103.82%	(\$798.00)
II-11			Reconstruct Upper Road						
II-11a	700	LF	Reconstruct Upper Road	\$11.00	\$7,700.00	687.00	\$7,557.00	98.14%	\$143.00
II-11b	1	LS	Construct Upper Road Swale	\$7,000.00	\$7,000.00	1.00	\$7,000.00	100.00%	\$0.00
II-12	290	LF	Reconstruct Lower Road	\$28.00	\$8,120.00	275.00	\$7,700.00	94.83%	\$420.00
II-13			Replace Cattle Guard And Culvert						
II-13a	1	LS	Replace Cattle Guard	\$13,500.00	\$13,500.00	1.00	\$13,500.00	100.00%	\$0.00
II-14			Install Construction BMPs						
II-14a	740	LF	Install Silt Fence	\$2.50	\$1,850.00	0.00	\$0.00	0.00%	\$1,850.00
II-14b	1,800	LF	Install Straw Wattles	\$2.00	\$3,600.00	200.00	\$400.00	11.11%	\$3,200.00
CO-5	1,486	CY	Resurface Belmont Drive	\$33.50	\$49,781.00	1,486.00	\$49,781.00	100.00%	\$0.00
CO-6	1	LS	Culvert at Ski Hill Lower Parking Lot	\$5,500.00	\$5,500.00	1.00	\$5,500.00	100.00%	\$0.00
CO-8	1	LS	Great Divide Sunnyside and Ditch Repairs	\$21,000.00	\$21,000.00	1.00	\$21,000.00	100.00%	\$0.00
			Subtotal, Great Divide - Non ARRA		\$673,706.64		\$657,960.26	97.66%	\$15,746.38

Schedule II - Great Divide Sand Tailings Reclamation Project - ARRA Funded Items									
Bid Item	EST QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	TOTAL PRICE	Units To Date	Cost To Date	Percent Complete	Balance to Bill
II-4			Construct Runoff Control Ditches						
II-4a	860	LF	Construct Runoff Control Ditch - Type I Riprap Lined	\$35.00	\$30,100.00	1580.00	\$55,300.00	183.72%	(\$25,200.00)
II-4b	90	LF	Construct Runoff Control Ditch - Type I Grouted Riprap Lined	\$65.00	\$5,850.00	0.00	\$0.00	0.00%	\$5,850.00
II-4c	235	LF	Construct Runoff Control Ditch - Type II Grouted Riprap Lined	\$125.00	\$29,375.00	283.00	\$35,375.00	120.43%	(\$6,000.00)
II-4d	635	LF	Construct Runoff Control Ditch - Grass Lined	\$30.00	\$19,050.00	0.00	\$0.00	0.00%	\$19,050.00
II-4e	1	LS	Construct Energy Dissipator	\$8,000.00	\$8,000.00	1.00	\$8,000.00	100.00%	\$0.00
II-7a	9,759	CY	Load, Haul, Place, And Grade Cover Soil	\$5.50	\$53,674.50	9535.00	\$52,442.50	97.70%	\$1,232.00
II-7b	1,003	CY	Provide and Place Surfacing Aggregate on Parking Lots	\$32.00	\$32,096.00	1088.00	\$34,816.00	108.47%	(\$2,720.00)
II-8	7	AC	Fertilize and Seed	\$650.00	\$4,550.00	6.26	\$4,069.00	89.43%	\$481.00
II-9	1	AC	Mulch	\$1,400.00	\$1,400.00	0.00	\$0.00	0.00%	\$1,400.00
II-10	29,638	SY	Install Erosion Control Mat	\$2.50	\$74,095.00	27174.00	\$67,935.000	91.69%	\$6,160.00
II-13b	344	LF	Replace Culverts	\$95.00	\$32,680.00	224.00	\$21,280.00	65.12%	\$11,400.00
			Subtotal, Great Divide - ARRA		\$290,870.50		\$279,217.50	95.99%	\$11,653.00
CO-11			Quantity Reconciliation (Bid Items I-9 and I-10)		\$532,802.55				\$532,802.55
CO-12			Quantity Reconciliation (All other non-ARRA Bid Items)		(\$33,943.15)				(\$33,943.15)
CO-12			Quantity Reconciliation (ARRA Bid Items)		(\$11,653.00)				(\$11,653.00)
CO-12			Fuel Price Adjustments		\$172,771.23		\$172,771.23		\$0.00
			TOTAL PROJECT		\$5,577,923.25		\$5,577,923.25	100.00%	\$0.00

6.0 TOTAL PROJECT COSTS

6.1 ARRA STIMULUS FUNDING



RECOVERY.GOV

The BLM granted the DEQ American Recovery and Reinvestment Act of 2009 (ARRA) stimulus funds for the Great Divide Sand Tailings Reclamation Project. Eleven bid items for the Great Divide Project (Table 5-1, Schedule II – ARRA Funded Items) were paid for with ARRA monies, totaling \$279,217.50. The DEQ reported to the Office of Management and Budget throughout the project on the use of the stimulus monies. The DEQ also ensured that the contractor abided by all of the stipulations that are identified in the ARRA for funding requirements and accountability.

Stimulus funds were awarded because the project benefits the public by reclaiming more land, improving local water quality, and protecting human health and the environment. The shared repository also consolidated the waste in one location, enabling more effective monitoring. Physical safety hazards from abandoned mine openings on land near Marysville, the repository site, and Great Divide Tailings Site also were mitigated to enhance the public's recreation experience. Finally, the projects used private sector consultants and contractors, which stimulated the local economy.

6.2 COST SUMMARY

The total construction cost incurred for the Bald Butte Mine and Millsite reclamation project (including repository construction) was \$4,467,974.26. Total construction cost for the Great Divide Sand Tailings reclamation project was \$937,177.76. Fuel price adjustments billed during the course of work totaled \$172,771.23. The total combined construction cost of the project was \$5,577,923.25.

Engineering costs for the reclamation projects totaled \$913,303.00. Costs associated with the site investigations, preparation of the *Expanded Engineering Evaluation/Cost Analysis for the Bald Butte Millsite and Devon/Sterling and Albion Mine Sites* (Olympus, 2004) and draft design of the Bald Butte Mine and Millsite reclamation project were \$179,915.99. Costs associated with the site investigations, preparation of the *Draft Final Expanded Engineering Evaluation/Cost Analysis for the Great Divide Sand Tailings* (Pioneer, 2007), and draft design of the Great Divide Sand Tailings project totaled \$185,188.96. Costs for engineering design and bid specification preparation for the final combined project bid package were \$171,441.61. Construction oversight and management costs were \$376,756.44.

An analysis of the site characterization, engineering, and construction costs for the project is presented in Table 6-1.

**Table 6-1:
Analysis of Engineering and Construction Costs for
the Bald Butte Mine and Millsite and
Great Divide Sand Tailings Reclamation Projects**

SITE CHARACTERIZATION AND ENGINEERING SERVICES	AMOUNT
Site Investigation, EEE/CA Preparation, Draft Design – Bald Butte Mine and Millsite (Olympus, 2002-2008)	\$179,915.99
Site Investigation, EEE/CA Preparation, Draft Design – Great Divide Sand Tailings (Pioneer, 2005-2009)	\$185,188.96
Final Engineering Design and Bid Specification Preparation (2009-2010)	\$171,441.61
Construction Inspection and Management – 2010 Season	\$113,790.94
Construction Inspection and Management – 2011 Season	\$157,573.38
Construction Inspection and Management – 2012 Season (through Nov. 30)	\$105,392.12
TOTAL ENGINEERING COSTS	\$913,303.00
2010 CONSTRUCTION SERVICES	
JEM Contracting – Original Contract Billed	\$1,737,623.53
JEM Contracting – Change Orders Billed	\$92,152.65
JEM Contracting – Fuel Price Adjustments	\$7,002.20
<i>Subtotal 2010 Construction Costs</i>	<i>\$1,829,776.18</i>
2011 CONSTRUCTION SERVICES	
JEM Contracting – Original Contract Billed	\$1,539,269.54
JEM Contracting – Change Orders Billed	\$222,606.00
JEM Contracting – Fuel Price Adjustments	\$89,726.68
<i>Subtotal 2011 Construction Costs</i>	<i>\$1,851,602.22</i>
2012 CONSTRUCTION SERVICES	
JEM Contracting – Original Contract Billed	\$1,733,736.50
JEM Contracting – Change Orders Billed	\$86,766.00
JEM Contracting – Fuel Price Adjustments	\$76,042.35
<i>Subtotal 2012 Construction Costs</i>	<i>\$1,896,544.85</i>
TOTAL CONSTRUCTION COST	\$5,577,923.25
TOTAL PROJECT COST (Engineering and Construction)	
	\$6,491,226.25
Engineering Investigation and Design/Construction Cost	9.6%
Construction Management/Construction Cost	6.8%
Total Engineering Cost/Construction Cost	16.4%
TOTAL ENGINEERING COST/ PROJECT COST	14.1%

The original contract price for construction of the combined project was \$4,515,668.62, resulting in a total over-run amount of \$1,062,254.63, or 24%. The most notable contributions to the over-run amount are as described in Section 4.4 and summarized below:

- \$78,220.00 under Change Order No. 1 to screen material excavated from the repository that was not suitable for use as cover soil;
- \$238,610.00 under Change Orders No. 2, 7, and 10 to mitigate additional mine collapse features discovered during the course of construction;
- \$49,781.00 under Change Order No. 5 to resurface Belmont Drive in accordance with the MOA between Lewis and Clark County and DEQ (the MOA was not finalized in time to be included in the bid package);
- \$532,802.55 under Change Order No. 11 to reconcile waste material quantity over-runs encountered during excavation at the Bald Butte Site; and
- \$172,771.23 paid in fuel price adjustments over the course of construction as a result of escalated fuel costs.

6.3 FUNDING SOURCES

The following is a list of funding sources and allocations towards the Bald Butte Mine and Millsite and Great Divide Reclamation Projects Contract # 410017:

**Table 6-2:
Funding Sources and Allocations for
the Bald Butte Mine and Millsite and
Great Divide Sand Tailings Reclamation Projects**

Source	Grant No.	Amount
Department of Natural Resources and Conservation - RIT	08-8687	\$300,000.00
Bureau of Land Management (non-ARRA)	L08AC15006	\$657,960.26
Bureau of Land Management (ARRA)	L10AC16410	\$279,217.50
Office of Surface Mining	N/A	\$4,340,745.40
	Total	\$5,577,923.25

7.0 POST CONSTRUCTION

7.1 SITE CONDITIONS AFTER COMPLETION

Waste sources that negatively impacted Jennie's Fork of Silver Creek and Dog Creek and its tributaries were removed and placed in an engineered repository to mitigate environmental exposure; physical safety hazards were mitigated to protect landowners and recreationists. Impacted areas were reclaimed and stream channels were reconstructed to re-establish vegetation and habitat.

Soil underlying the waste material was sampled at several locations within the upper TA-1 removal area in Dog Creek to ascertain suitability of sustaining vegetation without application of cover soil. Sampling results indicated elevated metals concentration levels below the risk-based cleanup goals (as updated in 2011) established for the site, and the underlying soil would support vegetation and not impose risk of exposure. No cover soil was applied to the upper end of TA-1 as a result of the analysis, and the underlying soil was revegetated in-place. Laboratory results and analysis are included in Appendix K.

Subsurface soils exposed during dewatering trench excavation within TA-1 also were sampled at greater depth due to their colored appearance (white, gray, red, and green). The subsurface samples were taken from material that represents a shallow mineralized zone of native material as indicated by the laboratory results included in Appendix K. Floodplain regrading was adjusted during construction to minimize exposure of the mineralized subsurface soils. Areas exposed during regrading had cover soil applied prior to revegetation, but could be re-exposed at some point in the future.

Underlying soil on steep-slope areas of the Devon/Sterling and Albion mine sites was hydroseeded and hydromulched in-place due to logistical and safety concerns associated with applying cover soil. Although no samples were taken from these areas, sampling results from underlying soil in Dog Creek infer that metals results are likely below the risk-based cleanup goals. Growth observed during the summer of 2012 indicates the underlying soil will support vegetation.

American Innovative Minerals (AIM) sampled waste rock placed in the repository from the Devon-Sterling and Albion mine sites. Assays were run on the waste rock samples to determine gold and silver content in the interest of pursuing reprocessing of the waste materials. Assay results provided by AIM and a map showing the sample locations are included in Appendix K.

Three monitoring wells were installed by DEQ at points surrounding the repository which can be sampled to confirm no negative impacts to groundwater as a result of waste placement in the lined repository. Monitoring well completion logs and initial sample results from BBGW-1 are included in Appendix K. The locations of the monitoring wells are shown on the as-built drawings included in Appendix L.

Approximately 12,000 cy of the R-4 stockpile remained at the north side of the repository at the conclusion of construction, consisting mostly of 6-inch minus screened material and several truckloads of 6- to 24-inch sized rock. The leftover material was intended to be placed as backfill in the cover soil borrow area. The USDI/BLM requested the material remain stockpiled for future use.

7.2 MAINTENANCE AND FOLLOW-UP

As detailed under the description for Change Order 8, snowmelt runoff at the Great Divide Site during the spring of 2012 eroded an abandoned road above the site and deposited sediment in runoff control ditches, causing overflow and moderate erosion to portions of the slope reclaimed in 2011. Repair and stabilization of the eroded areas was completed on June 27-28, 2012 to prevent future runoff from entering the reclaimed area and causing further erosion.

Weed growth at the Bald Butte Site became problematic during the 2012 season. The services of Helena Weed Control were utilized to apply herbicide along Ottawa Gulch Road and Bald Butte haul routes and to disturbed areas surrounding the repository. Weed growth in areas surrounding the Bald Butte project is extensive and is expected to continue to impact reclaimed areas.

Additional maintenance of the project sites will be determined based on continuation of post-reclamation monitoring. Periodic inspections will be conducted throughout the spring and summer of 2013, and a final inspection will be made prior to expiration of the contractor's warranty on November 2, 2013.

7.3 AS-BUILT DRAWINGS

As-Built Drawings representing final site conditions were prepared based on post-construction survey data and field notes, and are included in Appendix L.

8.0 REFERENCES

- DEQ/AMLB-Olympus, 2004. Expanded Engineering Evaluation/Cost Analysis for the Bald Butte Millsite and Devon/Sterling and Albion Mine Sites (EEE/CA). Prepared by Olympus Technical Services, Inc. December 2004.
- DEQ/AMLB-Olympus, 2008. Addendum to Expanded Engineering Evaluation/Cost Analysis for the Bald Butte Millsite and Devon/Sterling and Albion Mine Sites (EEE/CA). Prepared by Olympus Technical Services, Inc. December 2008.
- DEQ/AMLB-Pioneer, 1995. Montana Department of State Lands, Abandoned Mine Reclamation Bureau of Abandoned Hardrock Mine Priority Sites 1995 Summary Report. Prepared by Pioneer Technical Services, Inc. April 1995.
- RTI, 2008. Addendum to the June 2003 PRP Report for the Bald Mountain Mine, Marysville Mining District (PA No. 25-061). Prepared by Renewable Technologies, Inc. January 2008.
- USDI/BLM-Pioneer, 2007. Draft Final Expanded Engineering Evaluation/Cost Analysis for the Great Divide Sand Tailings (EEE/CA). Prepared by Pioneer Technical Services, Inc. November 2007.
- USDI/BLM-Pioneer, 2009. Addendum to the Draft Final Expanded Engineering Evaluation/Cost Analysis for the Great Divide Sand Tailings (EEE/CA). Prepared by Pioneer Technical Services, Inc. February 2009.

APPENDICES A-K

(Provided in electronic format on attached CD)

- Appendix A Pre-Construction Documentation**
 - Appendix A-1 Landowner Access Agreements
 - Appendix A-2 Pre-Bid Conference Agenda and Notes
 - Appendix A-3 Notice of Award
 - Appendix A-4 Contract Agreement and Notice to Proceed
 - Appendix A-5 Pre-Construction Meeting Agenda and Notes
 - Appendix A-6 Pre-Construction Submittals
- Appendix B Construction Daily Activity Reports and Field Notes**
- Appendix C Project Submittals and Information**
 - Appendix C-1 Repository Liner and Leachate System Components
 - Appendix C-2 Bald Butte Construction
 - Appendix C-3 Great Divide Construction
 - Appendix C-4 Delivery Tickets
- Appendix D Laboratory Data**
 - Appendix D-1 Soil Proctor Results
 - Appendix D-2 Repository Compaction Results
 - Appendix D-3 Pipe Bedding and Drain Rock Gradations
 - Appendix D-4 Repository Liner Test Results
- Appendix E Construction Progress Meeting Minutes**
- Appendix F Work Directive Changes**
- Appendix G Change Orders**
- Appendix H Payment Requests**
- Appendix I Payroll Approvals**
- Appendix J Project Completion Certificates**
- Appendix K Site Sampling and Monitoring Well Logs**
 - Appendix K-1 Dog Creek Soils
 - Appendix K-2 Repository Assays
 - Appendix K-3 Monitoring Wells

APPENDIX L

As-built Drawings