



COLORADO
Division of Reclamation,
Mining and Safety
Department of Natural Resources

1313 Sherman Street, Room 215
Denver, CO 80203

January 4, 2018

Jason McGraw
General Shale Brick, Inc.
1845 West Dartmouth Ave.
Denver, CO 80110

RE: Chieftain South Mine; DRMS File No. M-1981-148; Adequacy Review No. 1 (TR02)

Dear Mr. McGraw,

The Division of Reclamation, Mining and Safety (Division) received Technical Revision No. 2 for the Chieftain South Mine on December 28, 2017. The decision date for this Technical Revision is January 29, 2018. The Division has reviewed the Technical Revision Application and has the following comments:

1. The Operator is proposing to construct a temporary stormwater diversion ditch along the southern permit boundary to divert stormwater. The Division requests the following information:
 - a. Specify the size of the storm event for which the stormwater diversion channel was designed. The Division requires temporary stormwater structures to be designed for a 25-year / 24-hour storm event, while permanent stormwater structures must be designed for 100-year / 24-hour storm event.
 - b. Specify how long the temporary stormwater diversion channel will remain in place.
 - c. Provide the results of any analyses which were used to design the stormwater diversion ditch.
 - d. Clarify if the stormwater diversion ditch will be earth-lined.
 - e. Specify how the stormwater diversion ditch will be protected from erosion where the ditch turns from a north-south to an east-west direction. The Division recommends armoring the outside portion of the ditch in this section.
 - f. Specify how the terminus of the ditch will be armored to prevent erosion and potential head-cutting.
 - g. Specify how the natural drainage will be protected from scouring at the point where it receives the stormwater discharge.
 - h. Provide typical cross-section drawings of the stormwater diversion ditch for the upper, middle and lower sections.
2. The Operator has indicated the temporary stormwater diversion channel will be replaced with a permanent stormwater channel at the end of the life of the mine. The Operator should be aware the designs of the final stormwater diversion ditch must be submitted and approved through the appropriate revision prior to construction. In addition, the Division requests the Operator commit to not removing the temporary stormwater diversion ditch until such time as the permanent stormwater



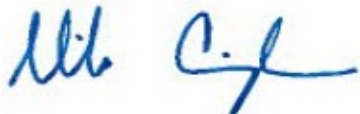
diversion ditch has been constructed or until other provisions for conveying stormwater have been approved by the Division. Please respond.

3. The Operator is proposing to perform reclamation at the end of the life of the mine, rather than concurrently. However, the Operator is not proposing a change to the maximum allowed affected area (99 acres) or to the financial warranty estimate. Please clarify how the proposed Reclamation Plan differs from the Reclamation Plan which is currently approved.
4. The Operator has revised the Reclamation Plan to include the application of mulch. The financial warranty estimate has been adjusted to account for this change to the Reclamation Plan. In addition, the unit costs for the other reclamation tasks have been updated. A copy of the financial warranty calculation has been enclosed for your review.
5. Please specify how often the Operator will monitor for noxious weeds.
6. The label for Staging Boundary 2 is obstructed by an adjacent label. Please update the Mining and Reclamation Plan Maps so the label for the Staging Boundary 2 is unobstructed.
7. The revised Mining Plan in the first paragraph of Page 12 (track changes version) contains errors with respect to the staging numbers. Please provide a corrected version of Page 12 of the Mining Plan.

This concludes the Division's preliminary adequacy review of this Technical Revision. Please remember the decision date for this Technical Revision is January 29, 2018. If you are unable to provide satisfactory responses to any inadequacies prior to this date, it will be your responsibility to request an extension of time to allow for continued review of this Technical Revision. If there are still unresolved issues when the decision date arrives and no extension has been requested, the Technical Revision will be denied.

If you have any questions, please contact me at (303)866-3567 x8116.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mike C.", is positioned above the printed name of the sender.

Michael A. Cunningham
Environmental Protection Specialist

Enclosure (1)

CC: Wally Erickson, DRMS

COST SUMMARY WORK

Task description: _____

Site: Chieftain South Mine

Permit Action: 2017 Bond Calculation

Permit/Job#: M1981148

PROJECT IDENTIFICATION

Task #: 000

State: Colorado

Abbreviation: None

Date: 7/18/2017

County: Jefferson

Filename: M148-000

User: MAC

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Backfill overburden	DOZER	1	695.51	\$171,168.00
002	Replace topsoil	SCRAPER1	1	50.90	\$50,698.00
003	Revegetating affected area	REVEGE	1	30.00	\$102,279.00
004	Equipment Mobilization	MOBILIZE	1	8.44	\$10,944.00
<u>SUBTOTALS:</u>				784.85	\$335,089

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$6,768.80
Performance bond:	1.05	Total =	\$3,518.43
Job superintendent:	0.00	Total =	\$0.00
Profit:	10.00	Total =	\$33,508.90
		TOTAL O & P =	\$43,796.13
		CONTRACT AMOUNT (direct + O & P) =	\$378,885.13

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	0.00	Total =	0.00
Engineering work and/or contract/bid preparation:	0.00	Total =	\$0.00
Reclamation management and/or administration:	5.00		\$18,944.26
CONTINGENCY:	0.00	Total =	\$0.00

TOTAL INDIRECT COST = \$62,740.39

TOTAL BOND AMOUNT (direct + indirect) = \$397,829.39

TOTAL BOND AMOUNT (rounded up) = \$397,830.00

BULLDOZER WORKTask description: **Backfill overburden**Site: **Chieftain South Mine** Permit Action: **2017 Bond Calculation** Permit/Job#: **M1981148****PROJECT IDENTIFICATION**

Task #: 001 State: Colorado Abbreviation: None
 Date: 7/18/2017 County: Jefferson Filename: M148-001
 User: MAC

Agency or organization name: DRMS**HOURLY EQUIPMENT COST**

Basic Machine: Cat D9T - 9SU
 Horsepower: 405
 Blade Type: Semi-Universal
 Attachment: 3-shank ripper
 Shift Basis: 1 per day
 Data Source: (CRG)

Cost Breakdown:

		<u>Utilization %</u>
Ownership Cost/Hour:	\$100.59	NA
Operating Cost/Hour:	\$87.23	100
Ripper own.	\$10.94	NA
Cost/Hour:		
Ripper op. Cost/Hour:	\$6.82	100
Operator Cost/Hour:	\$40.52	NA
Total unit Cost/Hour:	\$246.10	
Total Fleet Cost/Hour:	\$246.10	

MATERIAL QUANTITIES

Initial Volume: 341,435
 Swell factor: 1.000
 Loose volume: **341,435** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
 Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 200 feet
 Unadjusted hourly production: 700.0 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: -10 %
 Average site altitude: 6,000 feet

Material weight: 2,400 lbs/LCYWeight description: Clay and gravel - Dry

Job Condition Correction Factor Source
 Operator Skill: 0.750 (AVG.)

Material consistency:	1.000	(CAT HB)
Dozing method:	1.200	(SLOT)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.225	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.958	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7013

Adjusted unit
production: 490.91 LCY/hr

Adjusted fleet
production: **490.91** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: \$0.501/LCY

Total job time: **695.51** Hours

Total job cost: **\$171,168**

SCRAPER TEAM WORKTask description: Replace topsoilSite: Chieftain South MinePermit Action: 2017 Bond CalculationPermit/Job#: M1981148**PROJECT IDENTIFICATION**Task #: 002State: ColoradoAbbreviation: NoneDate: 7/18/2017County: JeffersonFilename: M148-002User: MACAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 631G
-Dozer:	NA
Support Equipment -Load Area:	NA
-Dump Area:	Cat D9T - 9SU
Road Maintenance -Motor Grader:	NA
-Water Truck:	Water Tanker, 2,500 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	NA	NA	100	NA	100
Ownership cost/hour:	\$98.72	NA	NA	\$100.59	NA	\$7.88
Operating cost/hour:	\$108.19	NA	NA	\$87.23	NA	\$14.74
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	NA	NA	\$0.00	NA	\$0.00
Ripper op. cost/hour:	NA	NA	NA	\$0.00	NA	\$0.00
Operator cost/hour:	\$41.46	NA	NA	\$40.52	NA	\$0.00
Unit Subtotals:	\$248.37	NA	NA	\$228.34	NA	\$22.62
Number of Units:	3	0	0	1	0	1
Group Subtotals:	Work:	\$745.11	Support:	\$228.34	Maint:	\$22.62

Total work team cost/hour: **\$996.07****MATERIAL QUANTITIES**Initial volume: 74,000

CCY

Swell factor: 1.000Loose volume: **74,000**

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>1,600 lbs/LCY</u>	Struck Volume:	<u>24.00</u>	LCY
Material description:	<u>Top Soil</u>	Heaped Volume:	<u>34.00</u>	LCY
Rated Payload:	<u>81,600 pounds</u>	Average Volume:	<u>29.00</u>	LCY
Payload Capacity:	<u>51.00 LCY</u>	Adjusted Capacity:	<u>29.00</u>	LCY

Cycle Time:

Scraper Loading Time: 0.80 Minutes
 Maneuver and Spread Time: 0.70 Minutes

Job Condition Correction:

Site Altitude: 6000 feet

	Scraper	Push Dozer	Source
Altitude Adj:	1.000	NA	(CAT HB)
Job Efficiency:	0.830	NA	(CAT HB)
Net Correction:	0.830	NA	

Travel Time:Road Condition: Hard, smooth, stabilized, surfaced, watered, maintained 2.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	5.00	2.00	7.00	962	1.07

Haul Time: 1.07 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	-5.00	2.00	-3.00	2920	0.41

Return Time: 0.41 minutes

Total Scraper team cycle time: 2.98 minutes
 Adjusted for job conditions: 484.63 LCY/Hour
 Selected Number of Scrapers: 3 Scraper(s)
 Adjusted single scraper team (unit) hourly production: 1,453.89 LCY/Hour
 Adjusted multiple scraper team (fleet) hourly production: 1,453.89 LCY/Hour

Unadjusted unit production/hour: 583.89 LCY/Hour

Optimal Number of Scrapers per push dozer: _____

JOB TIME AND COSTFleet size: 1 Team(s) Total job time: 50.90 HoursUnit cost: \$0.685 /LCY Total job cost: \$50,698

REVEGETATION WORKTask description: Revegetating affected areaSite: Chieftain South MinePermit Action: 2017 Bond CalculationPermit/Job#: M1981148PROJECT IDENTIFICATIONTask #: 003
Date: 7/18/2017
User: MACState: Colorado
County: JeffersonAbbreviation: None
Filename: M148-003Agency or organization name: DRMSFERTILIZING**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
			\$	\$
			Total Fertilizer Materials Cost/Acre	\$0.00

Application

Description	Cost /Acre
	\$
Total Fertilizer Application Cost/Acre	\$0.00

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	\$90.60
Total Tilling Cost/Acre	\$90.60

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Little Bluestem - Native	1.00	5.97	\$15.75
Sideoats Grama - Butte	1.00	3.28	\$9.67
Intermediate Wheatgrass - Oahe	4.00	8.54	\$15.36
Pubescent Wheatgrass - Greenleaf	3.50	7.23	\$13.06
Slender Wheatgrass - Native	3.00	10.95	\$8.46
Wheat, Winter - Tam 107	4.00	3.67	\$1.12
Totals Seed Mix	16.50	39.65	\$63.42

Application

Description	Cost /Acre
Drill Seeding (DRMS Survey Cost)	\$232.00
Total Seed Application Cost/Acre	\$232.00

MULCHING and MISCELLANEOUS

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$261.00	\$522.00
Total Mulch Materials Cost/Acre				\$522.00

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$66.02
Total Mulch Application Cost/Acre	\$66.02

NURSERY STOCK PLANTING

Common Name	No / Acre	Type and Size	Planting Cost	Fertilizer Pellet Cost	Cost /Acre
					\$
Totals Nursery Stock Cost / Acre					\$0.00

JOB TIME AND COST

No. of Acres:	99	Cost /Acre:	\$974.04
Estimated Failure Rate:	20%	Cost /Acre*:	\$295.42
*Selected Replanting Work Items:	SEEDING		
Initial Job Cost:	\$96,429.96		
Reseeding Job Cost:	\$5,849.32		
Total Job Cost:	\$102,279		
Job Hours:	30.00		

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: **Equipment Mobilization**Site: **Chieftain South Mine**Permit Action: **2017 Bond Calculation**Permit/Job#: **M1981148****PROJECT IDENTIFICATION**Task #: **004**State: **Colorado**Abbreviation: **None**Date: **7/18/2017**County: **Jefferson**Filename: **M148-004**User: **MAC**Agency or organization name: **DRMS****EQUIPMENT TRANSPORT RIG COST**Shift basis: **1 per day**Cost Data Source: **CRG Data**Truck Tractor Description: **GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED,
400 HP (2ND HALF, 2006)**Truck Trailer Description: **GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT
TRAILER (25T, 50T, AND 100T)****Cost Breakdown:**

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	\$16.63	\$18.37	\$22.33
Operating Cost/Hour:	\$44.38	\$46.13	\$50.07
Operator Cost/Hour:	\$27.66	\$27.66	\$27.66
Helper Cost/Hour:	\$0.00	\$25.39	\$25.39
Total Unit Cost/Hour:	\$88.67	\$117.55	\$125.45

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D9T - 9SU	66.13	\$111.53	\$125.45	1	\$236.98	\$125.45	\$250.00
Cat 631G	52.50	\$98.72	\$125.45	3	\$672.51	\$376.35	\$750.00
Drill/Broadcast Seeder with Tractor	25.00	\$12.22	\$88.67	1	\$100.89	\$88.67	\$250.00

Subtotals: **\$1,010.38** **\$590.47** **\$1,250.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 2,500 Gal.	\$22.62	1	\$22.62	\$22.62

Subtotals: **\$22.62** **\$22.62**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>LAKEWOOD</u>	
Total one-way travel distance:	<u>5.00</u>	miles
Average Travel Speed:	<u>45.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$10,938.78</u>
'* two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$5.03</u>
'** one round trip, no haul rig:	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.11</u>	<u>0.11</u>
Return Time (Hours):	<u>0.11</u>	<u>0.11</u>
Loading Time (Hours):	<u>2.00</u>	<u>NA</u>
Unloading Time (Hours):	<u>2.00</u>	<u>NA</u>
Subtotals:	<u>4.22</u>	<u>0.22</u>

JOB TIME AND COST

Total job time:	<u>8.44</u>	Hours
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Total job cost:	<u>\$10,944</u>
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