September 26, 2016

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

1313 Sherman Street, Room 215
Denver, CO 80203

Mike and Mardi Anson
Moffat Limestone Company
PO Box 777
Craig, CO 81626

RE: Juniper Quarry, Permit No. M-1982-141, Technical Revision (TR-4) Approval

Dear Mr. Anson:

On September 16, 2016 the Division of Reclamation, Mining and Safety (Division) approved the Technical Revision request (TR-4) submitted on July 18, 2016, addressing the following:

- *Updated mining plan and map.*
- *Updated reclamation plan. No reclamation maps were submitted.*
    - *Stipulation: prior to release, updated reclamation plans shall be submitted in the form of a technical revision depicting current site conditions and topography.*

The terms of the TR-4 approved by the Division are hereby incorporated into Permit No. M-1982-141. All other conditions and requirements of the permit remain in full force and effect.

The Division has updated the Reclamation cost estimated based on changes approved under TR-4. The Division has found that the currently held bond amount of $154,405 is adequate based on current disturbances observed on September 21, 2016 and the approved plans.

If you require additional information, or have questions or concerns, please feel free to contact me. Amy Yeldell at the Division of Reclamation, Mining and Safety, 1313 Sherman St., Room 215, Denver, CO 80203. Direct contact can be made by phone at 970-254-8511 or via email at amy.yeldell@ state.co.us

Sincerely,

Amy Yeldell

Amy Yeldell
Environmental Protection Specialist
Department of Natural Resources
Division of Reclamation, Mining and Safety
Phone: (970) 254-8511
Fax: (970) 241-1516

Cc:
Russ Means, Senior EPS, Grand Junction DRMS
Jennifer Maiolo, Little Snake Field Office BLM, 455 Emerson St, Craig, CO 81625

COST SUMMARY WORK

Task description: **Updated based on TR-4**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 7/22/2016 County: Moffat Filename: M141-000
User: ACY

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Removal of mining equipment and debris	DEMOLISH	1	8.00	$3,364.50
02a	AM1 Highwall Reduction	BLASTING	1	30.72	$10,281.00
03a	AM1 Highwall reduction (grade HW) and overburden	DOZER	2	6.43	$2,575.00
04a	AM1 Rip process area and access road	RIPPER	2	2.26	$968.00
05a	AM1 Distribute topsoil throughout disturbed area	LOADER	2	9.63	$2,707.00
06a	AM1 Spread topsoil	DOZER	2	4.13	$1,653.00
07a	AM1 Revegetate disturbed area	REVEGE	1	24.00	$15,386.00
08a	CN1 Highwall reduction	DOZER	1	14.64	$2,345.00
08b	CN1 Grade various processing benches	DOZER	2	8.51	$3,406.00
08c	CN1 Grade stockpiles	DOZER	2	2.72	$1,090.00
09a	CN1 Rip pit floor, process area and roads	RIPPER	2	4.67	$2,002.00
10a	CN1 Distribute topsoil throughout disturbed area	LOADER	2	25.62	$7,202.00
11a	CN1 Spread topsoil	DOZER	2	6.88	$2,754.00
12a	CN1 Revegetate disturbed area	REVEGE	1	40.00	$29,589.00
13a	Mobilize reclamation crew and equipment	MOBILIZE	1	4.66	$8,010.00
			SUBTOTALS:	**192.87**	**$93,333**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$1,885.33
Performance bond:	1.05	Total =	$980.00
Job superintendent:	96.44	Total =	$7,182.48
Profit:	10.00	Total =	$9,333.30
		TOTAL O & P =	$19,381.11
		CONTRACT AMOUNT (direct + O & P) =	$112,714.11

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	500.00	Total =	500.00
Engineering work and/or contract/bid preparation:	8.00	Total =	$9,017.13
Reclamation management and/or administration:	5.81		$6,548.69
CONTINGENCY:	0.00	Total =	$0.00
		TOTAL INDIRECT COST =	$35,446.93
		TOTAL BOND AMOUNT (direct + indirect) =	**$128,779.93**

DEMOLITION WORK

Task description: **Removal of mining equipment and debris**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 01A
Date: 7/22/2016
User: ACY

State: Colorado
County: Moffat

Abbreviation: None
Filename: M141-01a

Agency or organization name: DRMS

UNIT COSTS **Location adjustment: 91.30 %**

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Trailer and misc. metal in AM-1	8'W x 20'L x 10'H	Loading and 5 mile haul, salvage allowed - Steel frame structures	59.30	CY	$10.57	$626.80
Remove 10,000 gallon fuel tank	10,000 gallon	Haul tank to certified salvage dump - 9,000 to 12,000 gal. tank	1.00	EA	$1,050.00	$1,050.00
Remove steel trailers in CN-1	150 CY	Loading and 5 mile haul, salvage allowed - Steel frame structures	150.00	CY	$10.57	$1,585.50
Remove misc. refuse/debris in CN-1	40 CY	Loading and 5 mile haul, salvage allowed - Steel frame structures	40.00	CY	$10.57	$422.80

Job Hours: **8.00**

Subtotal (unadjusted): **$3,685.10**

Total Cost (adjusted for location): **$3,364.50**

SURFACE BLASTING WORK

Task description: **AM1 Highwall Reduction**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 02A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-02a
User: ACY

Agency or organization name: DRMS

BLAST AREA DIMENSIONS

	QUANTITY	UNIT
Blast Area Configuration:	Wedge-shaped mass (highwall reduction using balanced cut/fill)	
Blasting Method Description:	Conventional surface blast (fragmentation only)	
Highwall or Bench Face Angle:	0.00	h:1v
Regraded Slope Angle:	1.50	h:1v
Highwall or Bench Length:	300	feet
Highwall or Bench Width:	30	feet
Highwall or Bench Height:	50.0	feet
Depth to Base of Cut at Highwall:	20.0	feet

BLAST AREA VOLUMES

	QUANTITY	UNIT
Total Volume of Dimensional Mass to be Shot:	3,333	cubic yards
Blast Volume to Subdrill Grade and Blast Pattern Lines:	3,603	cubic yards
Blast Volume to Finish Grade and Blast Pattern Lines:	2,963	cubic yards
Remaining Volume Required to be Re-Shot or Ripped:	370	cubic yards

BLAST AREA DESIGN

	QUANTITY	UNIT
Recommended Blasthole Diameter:	2.940	inches
Selected Blasthole Diameter:	4.000	inches
Subdrilling Allowance:	2.4	feet
Blasthole Depth:	11.7	feet
Density of Rock:	Average Density Rock (ANFO Basis)	rock density
Burden to Charge Diameter Ratio:	25	times diameter
Burden:	8.0	feet
Spacing to Burden Ratio:	1.3	times burden
Spacing:	10.0	feet
Cubic Yards of Rock per Blasthole:	41.48	cubic yards
Powder Factor Description:	High	rock strength
Powder Factor:	1.000	pounds/cu. yd.
Density of Blasting Agent:	1.10	grams/cc
Quantity of Explosives per Blasthole:	41.48	POUNDS
Height of Powder Column:	6.92	feet
Height of Stemming per Blasthole:	4.81	feet
Stemming to Burden Ratio:	0.60	times burden
Quantity of Stemming per Blasthole:	0.0156	cubic yards
Number of Rows:	3	rows
Number of Blastholes per Row:	30	holes per row
Total Number of Blastholes:	90	holes
Total Length of all Blastholes:	1,056	feet

BLASTING MATERIALS QUANTITIES

	QUANTITY	UNIT
Total Quantity of Stemming Required:	1.40	cubic yards
Total Quantity of Explosives Required:	3,733	pounds
Total Quantity of det. cord/fuse/wire Required:	2,178	linear feet
Quantity of Blasting Caps per Blasthole:	1	cap(s)
Total Quantity of Blasting Caps Required:	90	caps
Quantity of Primers per Blasthole:	1	primer(s)
Total Quantity of Primers Required:	90	primers
Quantity of Delays per Blasthole:	1	delay(s)
Total Quantity of Delays Required:	93	delays

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Description
Drilling Equipment - Drill:	ATLAS COPCO ROC D7-11,4.0 in.
-Drill Pad Preparation:	Cat D8T - 8SU
Misc. Drill Support Equipment:	NA
Misc. Explosives Support Equipment:	NA
Explosives Delivery –Bulk Truck:	NA
-Cap Truck:	NA

Cost Breakdown:	Drilling Equipment	Drill Pad Preparation	Misc. Drill Support	Misc. Expl. Support	Explosives Delivery Bulk Truck	Explosives Delivery Cap Truck
	Drilling	Dozer				
%Utilization-machine:	100	100	NA	NA	NA	NA
Ownership cost/hour:	$69.43	$82.01	NA	NA	NA	NA
Operating cost/hour:	$69.00	$79.23	NA	NA	NA	NA
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	NA	NA	NA
Ripper op. cost/hour:	NA	$0.00	NA	NA	NA	NA
Operator cost/hour:	$0.00	$38.89	NA	NA	NA	NA
Unit Subtotals:	$138.43	$200.13	$0.00	$0.00	$0.00	$0.00
Number of Units:	1	1	0	0	0	0
Group Subtotals:	$138.43	$200.13	$0.00	$0.00	$0.00	$0.00

Total work team cost/hour: **$338.56**

MATERIALS COST

	Description	Unit	Unit Cost	Quantity	Total Cost
Blasting Agent:	Bulk ANFO high density (7,900-15,000 fps)	Pound	$0.341	3733.333	$1,273.07
Primers or Boosters:	Aluminized ANFO booster (electric or non-electric system)	Bag	$11.800	90.000	$1,062.00
Blasting Caps:	Electric cap, inst. (electric systems)	Each	$21.252	90.000	$1,912.68
Det. Cord, fuse, or wire:	Blasting wire, 12-14 gage (electric systems)	Linear foot	$0.088	2178.000	$191.66
Delays:	NO DELAY MATERIALS REQUIRED	NA	$0.000	93.000	$0.00
Miscellaneous:	Expl. magazine - agent (rental basis - meet MSHA req.)	Day	$6.118	0.000	$0.00

Drill bits:	Bit life = 1,400	Linear feet	$1,095.19	0.754	$826.09
				Total Materials Cost:	**$5,265.50**

DRILLING AND EXPLOSIVES PREPARATION TIME

Total Drilling Length:	1,056	linear feet
Unadjusted Drilling Rate:	112.00	feet/hour
Drilling Time:	14.81	hours

Job Condition Corrections:

Site Altitude:	6,600	feet
Altitude Adjustment:	0.95	(DRMS est.)
Job Efficiency Factor:	0.67	(CH. Exc. HB)
Adjusted Drilling Rate:	**71.29**	feet/hour
Explosives Prep. Time:	15.91	hours

JOB TIME AND COST

Total Job Time: **30.72** Hours

Unit cost: $2.853 per cu. yd.

Total Job Cost: **$10,281**

BULLDOZER WORK

Task description: **AM1 Highwall reduction (grade HW) and overburden**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 03A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-03a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $200.13
Total Fleet Cost/Hour: **$400.26**

MATERIAL QUANTITIES

Initial Volume: 6,000
Swell factor: 1.695
Loose volume: **10,169** LCY

Source of estimated volume: 3:1 overburden on benches, backfill highwall, stopckpiles
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,400.0 LCY/hr

Materials consistency description: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 790.30 LCY/hr

Adjusted fleet production: **1580.6** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)

Unit cost: $0.253/LCY

Total job time: **6.43** Hours

Total job cost: **$2,575**

BULLDOZER RIPPING WORK

Task description: **AM1 Rip process area and access road**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
Date: 7/22/2016 County: Moffat Filename: M141-04a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU Horsepower: 310
Ripper Attachment: 3-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper Ownership Cost/Hour:	$8.40	NA
Ripper Operating Cost/Hour:	$5.62	100
Operator Cost/Hour:	$38.89	NA
Total Unit Cost/Hour:	$214.15	

Total Fleet Cost/Hour: **$428.30**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 3.00 acres Rip Depth (ft): 2.00 Volume: 9,680 BCY or CCY

Source of estimated quantity: Field Estimates & Google Earth digitizing

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	mph
Average Ripping Width:	7.08	degrees
Average Ripping Length:	300.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.800	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.800	Acres/hr
Site Altitude:	6,600	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Adjusted Hourly Unit Production: 0.66 Acres/hr
Adjusted Hourly Fleet Production: **1.33** Acres/hr

JOB TIME AND COST

Fleet size: 2 Grader(s) Total job time: **2.26** Hours

Unit cost: $322.697 Per acre Total job cost: **$968**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **AM1 Distribute topsoil throughout disturbed area**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 05A
Date: 7/22/2016
User: ACY

State: Colorado
County: Moffat

Abbreviation: None
Filename: M141-05a

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 972H
Attachment 1: ROPS Cab

Horsepower: 287
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$44.71	NA
Operating Cost/Hour:	$57.22	100
Operator Cost/Hour:	$38.60	NA
Total Unit Cost/Hour:	$140.53	

Total Fleet Cost/Hour: $281.05

MATERIAL QUANTITIES

Initial volume: 6,050 CCY Swell factor: 1.000
Loose volume: **6,050** LCY

Source of estimated volume: 15 ac. disturbance x 3”
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.525 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material up to 1/8” diameter 0.02	0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high or less 0.01	0.010	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.010	minutes
	Adjusted Basic Cycle Time:	0.515	minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0
Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	200	0.00	5.00	5.00	0.1844	(Cat HB)
Return Route:	200	0.00	5.00	5.00	0.1664	(Cat HB)

Total Travel Time:	0.3508	minutes
Total Cycle Time:	**0.8658**	minutes

Load Bucket Capacity

Rated Capacity:	5.60	LCY (heaped)
Bucket Fill Factor:	0.975	Loose material - uniform aggregates to 1/8" (95-100%) 0.975
Adjusted Capacity:	**5.46**	LCY

Job Condition Correction Factors
Site Altitude: 6600 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	378.36	LCY/Hour
Adjusted Hourly Unit Production:	314.04	LCY/Hour
Adjusted Hourly Fleet Production:	**628.08**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**9.63**	Hours
Unit cost:	$0.447	/LCY	Total job cost:	**$2,707**	

BULLDOZER WORK

Task description: **AM1 Spread topsoil**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 06A State: Colorado Abbreviation: None
Date: 7/22/2016 County: Moffat Filename: M141-06a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $200.13
Total Fleet Cost/Hour: **$400.26**

MATERIAL QUANTITIES

Initial Volume: 6,050
Swell factor: 1.000
Loose volume: **6,050** LCY

Source of estimated volume: Task 05a
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 732.64 LCY/hr
Adjusted fleet production: **1465.28** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.273/LCY

Total job time: **4.13** Hours
Total job cost: **$1,653**

REVEGETATION WORK

Task description: **AM1 Revegetate disturbed area**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 07A State: Colorado Abbreviation: None
Date: 7/22/2016 County: Moffat Filename: M141-07a
User: ACY

Agency or organization name: DRMS

FERTILIZING

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
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$107.59
Total Tilling Cost/Acre	**$107.59**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indian Ricegrass - Nespar	6.00	19.42	$42.54
Sandberg Bluegrass - VNS	3.00	63.71	$26.10
Thickspike Wheatgrass - Critana	5.50	19.44	$28.49
Western Wheatgrass - Arriba	8.00	20.20	$29.52
Prairie Junegrass	7.50	398.66	$258.53
Totals Seed Mix	30.00	521.43	**$385.18**

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
Herbicide - Glyphosate (Journey)@ 1.0 pt/ac	1.00	ACRE	$1.56	$1.56
Total Mulch Materials Cost/Acre				**$1.56**

Application

Description	Cost /Acre
Weed spray, truck, non-aquatic area, nox. [DMG]	$62.72
Total Mulch Application Cost/Acre	**$62.72**

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: 15 Cost /Acre: $789.05

Estimated Failure Rate: 30% Cost /Acre*: $789.05

*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **$11,835.75**

Reseeding Job Cost: **$3,550.73**

Total Job Cost: **$15,386**

Job Hours: **24.00**

BULLDOZER WORK

Task description: **CN1 Highwall reduction**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 08A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-08a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8U
Horsepower: 305
Blade Type: Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$52.86	NA
Operating Cost/Hour:	$68.35	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $160.10
Total Fleet Cost/Hour: **$160.10**

MATERIAL QUANTITIES

Initial Volume: 10,000
Swell factor: 1.345
Loose volume: **13,450** LCY

Source of estimated volume: Backfill approx. 30 lft. x 30 ft. 1H:1V to 3H:1V
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,627.0 LCY/hr

Materials consistency description: Rock, well ripped or blasted 0.8

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5645

Adjusted unit production: 918.44 LCY/hr
Adjusted fleet production: **918.44** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.174/LCY

Total job time: **14.64** Hours
Total job cost: **$2,345**

BULLDOZER WORK

Task description: **CN1 Grade various processing benches**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 08B State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-08b
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $200.13
Total Fleet Cost/Hour: **$400.26**

MATERIAL QUANTITIES

Initial Volume: 12,500
Swell factor: 1.345
Loose volume: **16,813** LCY

Source of estimated volume: Grade benches, aprox 1500'L, avg 30' H
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,400.0 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor

		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7056

Adjusted unit production: 987.84 LCY/hr
Adjusted fleet production: **1975.68** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.203/LCY

Total job time: **8.51** Hours
Total job cost: **$3,406**

BULLDOZER WORK

Task description: **CN1 Grade stockpiles**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 08C
Date: 9/22/2016
User: ACY
State: Colorado
County: Moffat
Abbreviation: None
Filename: M141-08c

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $200.13
Total Fleet Cost/Hour: **$400.26**

MATERIAL QUANTITIES

Initial Volume: 4,000
Swell factor: 1.345
Loose volume: **5,380** LCY

Source of estimated volume: Grade stockpiles
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,400.0 LCY/hr

Materials consistency description: Consolidated stockpile 1.0

Average push gradient: -30 %
Average site altitude: 6,600 feet

Material weight: 2,600 lbs/LCY

Weight description: Limestone - Broken

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.601	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.885	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.7056

Adjusted unit production: 987.84 LCY/hr
Adjusted fleet production: **1975.68** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.203/LCY

Total job time: **2.72** Hours
Total job cost: **$1,090**

BULLDOZER RIPPING WORK

Task description: **CN1 Rip pit floor, process area and roads**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 09A
Date: 9/12/2016
User: ACY

State: Colorado
County: Moffat

Abbreviation: None
Filename: M141-09a

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Ripper Attachment: 3-Shank Ripper

Horsepower: 310
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper Ownership Cost/Hour:	$8.40	NA
Ripper Operating Cost/Hour:	$5.62	100
Operator Cost/Hour:	$38.89	NA
Total Unit Cost/Hour:	$214.15	
Total Fleet Cost/Hour:	**$428.30**	

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA
Area: 6.00 acres

Bank Volume: NA BCY NA
Rip Depth (ft): 2.00 Volume: 19,360 BCY or CCY

Source of estimated quantity: Filed estimates and Google Earth digitizing

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.56	mph
Average Ripping Width:	7.08	degrees
Average Ripping Length:	200.00	feet
Average Dozer Speed:	88.00	feet
Average Maneuver Time:	0.25	feet
Production per unit area:	0.773	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.773	Acres/hr
Site Altitude:	6,600	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.64	Acres/hr
Adjusted Hourly Fleet Production:	**1.28**	Acres/hr

JOB TIME AND COST

Fleet size: 2 Grader(s) Total job time: **4.68** Hours

Unit cost: $333.721 Per acre Total job cost: **$2,002**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **CN1 Distribute topsoil throughout disturbed area**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 10A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-10a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 972H Horsepower: 287
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$44.71	NA
Operating Cost/Hour:	$57.22	100
Operator Cost/Hour:	$38.60	NA
Total Unit Cost/Hour:	$140.53	

Total Fleet Cost/Hour: $281.05

MATERIAL QUANTITIES

Initial volume: 10,083 CCY Swell factor: 1.000
Loose volume: **10,083** LCY

Source of estimated volume: 25 ac. x 3”
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.525 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material up to 1/8” diameter 0.02	0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 0.00	0.000	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.020	minutes
	Adjusted Basic Cycle Time:	0.505	minutes

Rolling Resistance – Road Conditions

Haul: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0
Return: Rutted dirt, little maintenance, no water, 2” tire penetration 5.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	500	0.00	5.00	5.00	0.4611	(Cat HB)
Return Route:	500	0.00	5.00	5.00	0.4160	(Cat HB)

Total Travel Time:	0.8771	minutes
Total Cycle Time:	**1.3821**	minutes

Load Bucket Capacity

Rated Capacity:	5.60	LCY (heaped)
Bucket Fill Factor:	0.975	Loose material - uniform aggregates to 1/8" (95-100%) 0.975
Adjusted Capacity:	**5.46**	LCY

Job Condition Correction Factors
Site Altitude: 6600 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

Unadjusted Hourly Unit Production:	237.03	LCY/Hour
Adjusted Hourly Unit Production:	196.74	LCY/Hour
Adjusted Hourly Fleet Production:	**393.48**	LCY/Hour

JOB TIME AND COST

Fleet size:	2	Loader(s)	Total job time:	**25.63**	Hours
Unit cost:	$0.714	/LCY	Total job cost:	**$7,202**	

BULLDOZER WORK

Task description: **CN1 Spread topsoil**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 11A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-11a
User: ACY

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$82.01	NA
Operating Cost/Hour:	$79.23	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$38.89	NA

Total unit Cost/Hour: $200.13
Total Fleet Cost/Hour: **$400.26**

MATERIAL QUANTITIES

Initial Volume: 10,083
Swell factor: 1.000
Loose volume: **10,083** LCY

Source of estimated volume: Task 12a
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 100 feet
Unadjusted hourly production: 852.6 LCY/hr

Materials consistency description: Loose stockpile 1.2

Average push gradient: 0 %
Average site altitude: 6,600 feet

Material weight: 1,600 lbs/LCY

Weight description: Top Soil

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.8593

Adjusted unit production: 732.64 LCY/hr
Adjusted fleet production: **1465.28** LCY/hr

JOB TIME AND COST

Fleet size: 2 Dozer(s)
Unit cost: $0.273/LCY

Total job time: **6.88** Hours
Total job cost: **$2,754**

REVEGETATION WORK

Task description: **CN1 Revegetate disturbed area**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 12A State: Colorado Abbreviation: None
Date: 9/12/2016 County: Moffat Filename: M141-12a
User: ACY

Agency or organization name: DRMS

FERTILIZING

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
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$107.59
Total Tilling Cost/Acre	**$107.59**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Indian Ricegrass - Nespar	6.00	19.42	$42.54
Sandberg Bluegrass - VNS	3.00	63.71	$26.10
Thickspike Wheatgrass - Critana	5.50	19.44	$28.49
Western Wheatgrass - Arriba	8.00	20.20	$29.52
Prairie Junegrass	7.50	398.66	$258.53
Totals Seed Mix	30.00	521.43	**$385.18**

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
Herbicide - Glyphosate (Journey)@ 1.0 pt/ac	1.00	ACRE	$1.56	$1.56
Total Mulch Materials Cost/Acre				**$1.56**

Application

Description	Cost /Acre
Weed spray, truck, non-aquatic area, nox. [DMG]	$62.72
Total Mulch Application Cost/Acre	**$62.72**

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: 30 Cost /Acre: $789.05
Estimated Failure Rate: 25% Cost /Acre*: $789.05
*Selected Replanting Work Items: TILLING,SEEDING,MULCHING

Initial Job Cost: **$23,671.50**
Reseeding Job Cost: **$5,917.88**
Total Job Cost: **$29,589**
Job Hours: **40.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilize reclamation crew and equipment**

Site: **Juniper Quarry** Permit Action: TR-4 Permit/Job#: M1982141

PROJECT IDENTIFICATION

Task #: 13A
Date: 9/12/2016
User: ACY

State: Colorado
County: Moffat

Abbreviation: None
Filename: M141-13a

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 D8T - 8SU	53.08	$65.28	$125.45	2	$381.46	$250.90	$500.00
CAT 972H	28.00	$36.70	$117.55	2	$308.50	$235.10	$500.00
ATLAS COPCO ROC D7-11,4.0 in.	0.00	$48.87	$88.67	1	$137.54	$88.67	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$30.65	$88.67	1	$119.32	$88.67	$250.00
Power Mulcher (Reinco M90)	6.00	$6.72	$88.67	1	$95.39	$88.67	$250.00
				Subtotals:	**$1,042.21**	**$752.01**	**$1,750.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 1 T. Crew	$25.30	1	$25.30	$25.30
		Subtotals:	**$25.30**	**$25.30**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	CRAIG	
Total one-way travel distance:	30.00	miles
Average Travel Speed:	45.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$7,976.71	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$33.73	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.67	0.67
Return Time (Hours):	0.67	0.67
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	2.33	1.33

JOB TIME AND COST

Total job time: **4.67** Hours

Total job cost: **$8,010**