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

December 13, 2021

Mr. David Bieber
Front Range Aggregates, LLC
c/o Martin Marrietta Materials
1627 Cole Boulevard, Suite 200
Lakewood, CO 80401

Re: Parkdale Quarry, Permit No. M-1997-054;
Amendment 2 (AM-2) Reclamation Cost Estimate

Dear Mr. Bieber,

The Division has completed its reclamation cost estimate for the AM-2 proposed revision. The tasks presented in the attached Cost Summary Work document are based on the AM-2 application and subsequent responses to our adequacy letters received through December 11, 2021. Please review the attached document and let me know if you have any concerns. I have copied Stephanie Carter (BLM) as per our MOU, we coordinate bond estimates on lands managed by the BLM. Note the tasks related to the expansion of the mine into the BLM managed lands is a phased bond which addresses only phase 1 at this time (see tasks E100 through E120).

The current decision date is December 17, 2021. As such, please provide notice of any concerns in this estimate no later than December 15th, as I will be in the field on December 16th.

We are reviewing your latest adequacy responses sent via email on December 10th.

If you have any questions, please contact me at (303) 328-5229.

Sincerely,

Timothy A. Cazier, P.E.
Environmental Protection Specialist

ec: Michael Cunningham, DRMS
DRMS file
Stephanie Carter, BLM

COST SUMMARY WORK

Task description: **Reclamation Cost Summary**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: 0000
Date: 12/13/2021 10:49:15 AM
User: TC1

State: Colorado
County: Fremont

Abbreviation: None
Filename: M054-0000

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task [1]	Description	Form Used	Fleet Size	Task Hours	Cost
A010	Backfill alluvial pit (Source A: overburden/waste)	SCRAPER1	1	818.79	$1,503,131
A011	Backfill alluvial pit (Source B: blasted from private granit	TRUCK1	1	1,127.85	$2,435,205
A012	Place topsoil on 131 acres @ 9" depth	TRUCK1	1	414.02	$405,387
A013	Reveg 131-Ac Alluvial Pit Area	REVEGE	1	268.00	$169,858
A014	Soil Testing for fertilizer assessment (LS)	NA	1	2.00	$1,500
AR10	Rip pit floor for 90% of liner	RIPPER	1	160.53	$55,103
AR15	Recompact ripped reservoir floor	COMPACT	1	23.27	$9,614
AR20	Transport/place 90% reservoir liner from alluvial pit floor	SCRAPER1	1	189.09	$274,078
AR21	Purchase, deliver FOB offsite 6,600 CY clay ($7/ton @ 1.8T/C	NA	1	0.00	$83,160
AR22	Transport/place 10% reservoir liner from onsite stockpile	SCRAPER1	1	12.96	$15,911
E100	Backfill 4,000 ft of benches not concurrently reclaimed	TRUCK1	1	138.65	$139,109
E105	Hydroseed 4,000 ft of benches not concurrently reclaimed	REVEGE	1	8.00	$5,760
E110	Rip pit floor of Phase 1	RIPPER	1	34.32	$11,653
E111	Construct drainage channels - Blasting (LS: 9,778 CY @ $1.4	NA	1	80.00	$13,689
E112	Construct drainage channels - Remove blasted material	TRUCK1	1	24.82	$27,597
E115	Topsoil pit floor of Phase 1 (9 inches)	TRUCK1	1	70.97	$69,486
E120	Reveg pit floor of Phase 1	REVEGE	1	50.00	$32,001
G100	Backfill 1,000 ft of benches not concurrently reclaimed	TRUCK1	1	35.66	$41,113
G105	Hydroseed 1,000 ft of benches not concurrently reclaimed	REVEGE	1	4.00	$1,554
G110	Rip existing granite pit floor	RIPPER	1	32.18	$10,926
G115	Topsoil existing pit floor (9 inches x 23.14 Ac)	TRUCK1	1	75.20	$87,710
G120	Reveg existing granite pit floor	REVEGE	1	50.00	$30,004
SW01	Sitewide cleanup - 151 hrs of Compactor work	COMPACT	1	151.18	$13,607
SW02	Sitewide cleanup ~$150/hr grader	GRADER	1	150.31	$22,507
SW03	Sitewide cleanup D7 dozer	DOZERGRADER	1	151.00	$30,449
SW04	Sitewide cleanup Water Truck	MISCTRUK	1	151.00	$22,685
SW99	Mob/Demob equipment	MOBILIZE	1	6.15	$35,751

WG02	Demo plant concrete support structures & conveyor	DEMOLISH	1	0.00	$11,283
WG04	Scarify compacted ground	RIPPER	1	36.16	$12,277
WG05	Replace topsoil (6 in x 26 Ac)	TRUCK1	1	42.95	$48,922
WG06	Seed and Mulch plant area	REVEGE	1	50.00	$33,712
			SUBTOTALS:	**4359.06**	**$5,654,742**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$114,226
Performance bond:	1.05	Total =	$59,375
Job superintendent:	2,181.19	Total =	$157,111
Profit:	10.00	Total =	$565,474
		TOTAL O & P =	$896,186
		CONTRACT AMOUNT (direct + O & P) =	$6,550,928

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$0	Total =	$0
Engineering work and/or contract/bid preparation:	4.25	Total =	$278,414
Reclamation management and/or administration:	5.00		$327,546
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$1,502,147
		TOTAL BOND AMOUNT (direct + indirect) =	**$7,156,889**

(1) Task Outline

Task	Task Description
Axxx	Alluvial pit area tasks
ARxx	Alluvial pit reservoir tasks
E1xx	Expansion area tasks (Phase 1)
Gxxx	Granite Pit (Private) area tasks
SWxx	Sitewide cleanup
WGxx	Wash Plant Removal (AM-1, Exh L, Aspect G)

SCRAPER TEAM WORK

Task description: **Backfill alluvial pit (Source A: overburden/waste)**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	A010	State:	Colorado	Abbreviation:	None
Date:	12/8/2021	County:	Fremont	Filename:	M054-A010
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G
-Dozer:	Cat D9T - 9SU
Support Equipment -Load Area:	NA
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$218.34	$126.01	NA	$126.01	$85.80	$53.88
Operating cost/hour:	$208.00	$141.41	NA	$141.41	$60.40	$75.23
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$30.90	$41.30	NA	$41.30	$28.56	$0.00
Unit Subtotals:	$457.24	$308.72	NA	$308.72	$174.76	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$1,223.20	Support:	$308.72	Maint:	$303.87

Total work team cost/hour: **$1,835.79**

MATERIAL QUANTITIES

Initial volume:	550,000	CCY	Swell factor:	1.250
Loose volume:	**687,500**	LCY		

Source of estimated volume: AM-2, Exh L, p. 7
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

Material weight:	2,650 lbs/LCY	Struck Volume:	24.00	LCY
Material description:	Decomposed rock - 25% Rock, 75% Earth	Heaped Volume:	34.00	LCY
Rated Payload:	81,600 pounds	Average Volume:	29.00	LCY
Payload Capacity:	30.79 LCY	Adjusted Capacity:	**29.00**	LCY

Cycle Time:

Scraper Loading Time: 0.60 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 5800 feet

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

Travel Time:

Road Condition: Rutted dirt, little maintenance, no water, 2" tire penetration 5.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	-5.00	5.00	0.00	2965	0.84

Haul Time: **0.84** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	5.00	5.00	10.00	1476	1.40

Return Time: **1.40** minutes

Total Scraper team cycle time: **3.44** minutes
Adjusted for job conditions: 419.83 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 839.65 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **839.65** LCY/Hour

Unadjusted unit production/hour: 505.81 LCY/Hour
Optimal Number of Scrapers per push dozer: ______

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **818.79** Hours

Unit cost: $2.186 /LCY Total job cost: **$1,503,131**

TRUCK/LOADER TEAM WORK

Task description: **Backfill alluvial pit (Source B: blasted from private granit**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: A011 State: Colorado Abbreviation: None
Date: 12/8/2021 County: Fremont Filename: M054-A011
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 775F
-Loader:	CAT 990H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D9T - 9SU
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$121.36	$116.41	NA	$126.01	$66.63	$53.88
Operating cost/hour:	$93.48	$110.53	NA	$141.41	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$33.71	$40.71	NA	$41.30	$28.56	$0.00
Unit Subtotals:	$248.55	$267.65	NA	$308.72	$149.73	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work: $764.75		Support: $308.72		Maint: $278.84	

Total work team cost/hour: **$1,352.31**

MATERIAL QUANTITIES

Initial volume: 650,000 CCY Swell factor: 1.000
Loose volume: **650,000** LCY

Source of estimated volume: AM-2, Exh L, p. 7/ Material cost is for blasting ($1.40/CY)
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $1.40
Total Cost: $910,000.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 3,250 Pounds/LCY
Description: Gravel - Pitrun
Rated Payload: 141,220 Pounds
Payload Capacity: 43.45 LCY

Truck Bed (volume) Basis:

Struck Volume:	43.30	LCY
Heaped Volume:	55.60	LCY
Average Volume:	49.45	LCY
Adjusted Volume:	43.45	LCY

Final Truck Volume Based on Number of Loader Passes: **37.13** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	11.250	LCY (heaped)
Bucket Fill Factor:	0.825	Blasted rock - avg. blasted (75 - 90%) 0.825
Adjusted Capacity:	**9.281**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	Loader	Source
Altitude Adj:	1.000	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.830**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA

Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.600 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Bank or broken material 0.04	0.040	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.040	minutes
	Adjusted Loader Cycle Time:	**0.560**	minutes
	Net Load Time per Truck:	**1.780**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.80	Minutes	Adjusted for site altitude:	0.800	Minutes
Truck Load Time:	1.780	Minutes	Adjusted for site altitude:	1.780	Minutes
Truck Maneuver and Dump Time:	1.20	Minutes	Adjusted for site altitude:	1.200	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3000.00	-3.00	4.00	1.00	3550	1.284

Haul Time: **1.284** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3000.00	3.00	4.00	7.00	2453	1.352

Return Time: **1.352** minutes
Total Truck Cycle Time: **6.416** minutes

Loading Tool unit Production 863.37 LCY/Hour — Adjusted for job efficiency: 716.60 LCY/Hour

Truck Unit Production 347.18 LCY/Hour — Adjusted for job efficiency: 288.16 LCY/Hour

Optimal No. of Trucks: 2 Truck(s) — Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 576.32 LCY/Hour
Adjusted single truck/loader team production: 576.32 LCY/Hour
Adjusted multiple truck/loader team production: **576.32** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) — Total job time: **1,127.85** Hours

Unit cost: $2.346 /LCY — Total job cost: **$2,435,205**

TRUCK/LOADER TEAM WORK

Task description: **Place topsoil on 131 acres @ 9" depth**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	A012	State:	Colorado	Abbreviation:	None
Date:	12/8/2021	County:	Fremont	Filename:	M054-A012
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	CAT 160M
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$88.53	$67.72	NA	$66.63	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$54.54	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$28.56	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$149.73	$149.73	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$550.57	Support:	$149.73	Maint:	$278.84

Total work team cost/hour: **$979.14**

MATERIAL QUANTITIES

Initial volume: 158,510 CCY Swell factor: 1.429
Loose volume: **226,447** LCY

Source of estimated volume: AM-2, Exh L, pp. 3 & 9
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 1,600 Pounds/LCY
Description: Top Soil
Rated Payload: 87,000 Pounds
Payload Capacity: 54.38 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	**Loader**	**Source**
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA

Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
2	2000.00	-1.00	4.00	3.00	3005	1.458

Haul Time: **1.458** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	1.00	4.00	5.00	3005	0.905

Return Time: **0.905** minutes
Total Truck Cycle Time: **5.600** minutes

Loading Tool unit Production: 840.55 LCY/Hour — Adjusted for job efficiency: 697.65 LCY/Hour

Truck Unit Production: 329.48 LCY/Hour — Adjusted for job efficiency: 273.47 LCY/Hour

Optimal No. of Trucks: 3 Truck(s) — Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 546.94 LCY/Hour
Adjusted single truck/loader team production: 546.94 LCY/Hour
Adjusted multiple truck/loader team production: **546.94** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) — Total job time: **414.02** Hours

Unit cost: $1.790 /LCY — Total job cost: **$405,387**

REVEGETATION WORK

Task description: **Reveg 131-Ac Alluvial Pit Area**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: A013 State: Colorado Abbreviation: None
Date: 12/8/2021 County: Fremont Filename: M054-A013
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alfalfa - Common	0.20	0.96	$0.51
Blue Grama - Native	1.10	17.95	$15.10
Indian Ricegrass - Native	2.10	6.80	$13.65
Canby Bluegrass - Canbar	0.20	4.25	$2.05
Sand Dropseed	0.05	5.97	$0.49
Sideoats Grama - Vaughn	1.80	5.91	$15.08
Sheep Fescue - Bighorn	0.40	6.24	$1.76
Thickspike Wheatgrass - Critana	1.60	5.66	$11.00
Western Wheatgrass - Native	2.00	5.05	$12.00
Sage, Fringed	0.03	2.51	$1.23

Sagebrush, Louisiana or Prairie	0.03	3.02	$4.01
Saltbush, Four Wing	0.10	0.14	$1.25
Spike Muhly	0.20	7.35	$1.94
Sumac, Skunkbrush	0.10	0.05	$2.10
Purple Three-Awn	0.10	1.15	$2.66
Totals Seed Mix	10.01	73.01	**$84.82**

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**
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	**Cost /Acre**
Crimping, with tractor {DMG survey data}	$71.57
Total Mulch Application Cost/Acre	**$71.57**

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: 131
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,233.26
Cost /Acre*: $316.82

Initial Job Cost: **$161,557.06**
Reseeding Job Cost: **$8,300.68**
Total Job Cost: **$169,858**
Job Hours: **268.00**

BULLDOZER RIPPING WORK

Task description: **Rip pit floor for 90% of liner**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	AR10	State:	Colorado	Abbreviation:	None
Date:	12/9/2021	County:	Fremont	Filename:	M054-AR10
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D9T - 9SU	Horsepower:	405
Ripper Attachment:	1-Shank Ripper	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$126.01	NA
Operating Cost/Hour:	$141.41	100
Ripper Ownership Cost/Hour:	$22.17	NA
Ripper Operating Cost/Hour:	$12.36	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$343.25	

Total Fleet Cost/Hour: **$343.25**

MATERIAL QUANTITIES

Selected estimating method: Seismic

Alternate Methods:

Seismic:	59,400	BCY	Bank Volume:	59,400	BCY		Adverse	
Area:	NA	acres	Rip Depth (ft):	NA	Volume:		NA	BCY or CCY

Source of estimated quantity: AM-2 Exh L - 90% of 66,000 CY req'd volume

HOURLY PRODUCTION

Seismic:

Seismic Velocity:	5,000	feet/second

Area:

Average Ripping Depth:	NA	feet/pass
Average Ripping Width:	NA	feet/pass
Average Ripping Length:	NA	feet/pass
Average Dozer Speed:	NA	feet/minute
Average Maneuver Time:	NA	minutes/pass
Production per unit area:	NA	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	445.80	Cu. yds./hr
Site Altitude:	6,800	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	370.01	Cu. yds./hr
Adjusted Hourly Fleet Production:	**370.01**	Cu. yds./hr

JOB TIME AND COST

Fleet size:	1	Grader(s)	Total job time:	**160.53**	Hours
Unit cost:	$0.928	Per cu. yd.	Total job cost:	**$55,103**	

COMPACTION WORK

Task description: **Recompact ripped reservoir floor**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	AR15	State:	Colorado	Abbreviation:	None
Date:	12/9/2021	County:	Fremont	Filename:	M054-AR15
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	CAT 836H	Horsepower:	499
Compactor Type:	Sanitation - chopper foot	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$223.80	NA
Operating Cost/Hour:	$163.25	100
Operator Cost/Hour:	$26.02	NA
Total Unit Cost/Hour:	$413.07	
Total Fleet Cost/Hour:	**$413.07**	

MATERIAL QUANTITIES

Loose volume:	7,911	LCY	Shrinkage factor:	0.875
Compacted volume:	**6,922**	CCY		

Source of estimated volume: Exh F, 9.81 Ac floor x 6” depth

Source of estimated shrinkage factor: Cat Handbook

HOURLY PRODUCTION

Unadjusted hourly production = (W x S x L x C) / P

Compacted width per pass (W):	9.16	feet
Average Compactor Speed (S):	2.00	mph
Compacted thickness of each lift (L):	6.00	inches
Conversion Constant (C):	16.3	(5,280ft./12in./27cu.ft.)
Required number of machine passes (P):	5	passes
Unadjusted Hourly Unit Production:	358.34	CCY/hour

Job Condition Correction Factors

Site Altitude: 6,800 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.8300	multiplier

Adjusted Hourly Unit Production:	297.42	CCY/Hour
Adjusted Hourly Fleet Production:	**297.42**	CCY/Hour

JOB TIME AND COST

Fleet size:	1	Compactor(s)	Total job time:	**23.27**	Hours
Unit cost:	$1.389	per CCY	Total job cost:	**$9,614**	

SCRAPER TEAM WORK

Task description: **Transport/place 90% reservoir liner from alluvial pit floor**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: AR20 State: Colorado Abbreviation: None
Date: 12/9/2021 County: Fremont Filename: M054-AR20
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 627G
-Dozer:	Cat D9T - 9SU
Support Equipment -Load Area:	NA
-Dump Area:	CAT 815F
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$154.27	$126.01	NA	$91.25	$66.63	$53.88
Operating cost/hour:	$153.83	$141.41	NA	$66.66	$54.54	$75.23
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$30.90	$41.30	NA	$26.02	$28.56	$0.00
Unit Subtotals:	$339.00	$308.72	NA	$183.93	$149.73	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$986.72	Support:	$183.93	Maint:	$278.84

Total work team cost/hour: **$1,449.49**

MATERIAL QUANTITIES

Initial volume: 59,400 CCY Swell factor: 1.165
Loose volume: **69,201** LCY

Source of estimated volume: AM-2, Exh L, p. 4
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

Material weight: 2,100 lbs/LCY
Material description: Shale
Rated Payload: 52,800 pounds
Payload Capacity: 25.14 LCY

Struck Volume: 15.70 LCY
Heaped Volume: 22.00 LCY
Average Volume: 18.85 LCY
Adjusted Capacity: **18.85** LCY

Cycle Time:

Scraper Loading Time: 0.40 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 5800 feet

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

Travel Time:
Road Condition: Soft, rutted dirt, no maintenance or water, 8" tire penetration 14

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1800.00	5.00	14.00	19.00	578	3.12

Haul Time: **3.12** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1800.00	-5.00	14.00	9.00	1930	1.01

Return Time: **1.01** minutes

Total Scraper team cycle time: **5.13** minutes
Adjusted for job conditions: 182.99 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 365.98 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **365.98** LCY/Hour

Unadjusted unit production/hour: 220.47 LCY/Hour
Optimal Number of Scrapers per push dozer: ______

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **189.09** Hours

Unit cost: $3.961 /LCY Total job cost: **$274,078**

SCRAPER TEAM WORK

Task description: **Transport/place 10% reservoir liner from onsite stockpile**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: AR22 State: Colorado Abbreviation: None
Date: 12/9/2021 County: Fremont Filename: M054-AR22
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 627G
-Dozer:	Cat D8T - 8SU
Support Equipment -Load Area:	NA
-Dump Area:	CAT 815F
Road Maintenance –Motor Grader:	NA
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	NA	100
Ownership cost/hour:	$154.27	$97.46	NA	$91.25	NA	$53.88
Operating cost/hour:	$153.83	$97.63	NA	$66.66	NA	$75.23
%Utilization-ripper:	NA	NA	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	NA	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	NA	$0.00
Operator cost/hour:	$30.90	$41.30	NA	$26.02	NA	$0.00
Unit Subtotals:	$339.00	$236.39	NA	$183.93	NA	$129.11
Number of Units:	2	1	0	1	0	1
Group Subtotals:	Work:	$914.39	Support:	$183.93	Maint:	$129.11

Total work team cost/hour: **$1,227.43**

MATERIAL QUANTITIES

Initial volume: 6,600 CCY Swell factor: 1.250
Loose volume: **8,250** LCY

Source of estimated volume: DRMS (place materialfrom Task AR21)
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Scraper Bowl (volume) Basis:

Material weight: 2,800 lbs/LCY
Material description: Clay - Wet
Rated Payload: 52,800 pounds
Payload Capacity: 18.86 LCY

Struck Volume: 15.70 LCY
Heaped Volume: 22.00 LCY
Average Volume: 18.85 LCY
Adjusted Capacity: **18.85** LCY

Cycle Time:

Scraper Loading Time: 0.50 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 5800 feet

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

Travel Time:
Road Condition: Soft, rutted dirt, no maintenance or water, 4" tire penetration 8.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	-3.00	8.00	5.00	2218	0.85

Haul Time: **0.85** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	3.00	8.00	11.00	1584	1.00

Return Time: **1.00** minutes

Total Scraper team cycle time: **2.95** minutes
Adjusted for job conditions: 318.21 LCY/Hour
Selected Number of Scrapers: 2 Scraper(s)
Adjusted single scraper team (unit) hourly production: 636.43 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **636.43** LCY/Hour

Unadjusted unit production/hour: 383.39 LCY/Hour
Optimal Number of Scrapers per push dozer: ______

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **12.96** Hours

Unit cost: $1.929 /LCY Total job cost: **$15,911**

TRUCK/LOADER TEAM WORK

Task description: **Backfill 4,000 ft of benches not concurrently reclaimed**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	E100	State:	Colorado	Abbreviation:	None
Date:	12/9/2021	County:	Fremont	Filename:	M054-E100
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D6T LGP
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$88.53	$67.72	NA	$66.27	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$66.34	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$41.30	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$173.91	$149.73	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$550.57	Support:	$173.91	Maint:	$278.84

Total work team cost/hour: **$1,003.32**

MATERIAL QUANTITIES

Initial volume: 66,680 CCY Swell factor: 1.250

Loose volume: **83,350** LCY

Source of estimated volume: AM2, Exh L, p. 2 - PAR resp.; Tsk E100.1

Source of estimated swell factor: Cat Handbook

Material Purchase Cost: $0.00

Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,650 Pounds/LCY

Description: Decomposed rock - 25% Rock, 75% Earth

Rated Payload: 87,000 Pounds

Payload Capacity: 32.83 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	**Loader**	**Source**
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA
Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	2.00	4.00	6.00	1566	1.213

Haul Time: **1.213** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	-2.00	4.00	2.00	3005	0.645

Return Time: **0.645** minutes
Total Truck Cycle Time: **5.095** minutes

Loading Tool unit Production 840.55 LCY/Hour Adjusted for job efficiency: 697.65 LCY/Hour
Truck Unit Production 362.14 LCY/Hour Adjusted for job efficiency: 300.58 LCY/Hour

Optimal No. of Trucks: 2 Truck(s) Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 601.16 LCY/Hour
Adjusted single truck/loader team production: 601.16 LCY/Hour
Adjusted multiple truck/loader team production: **601.16** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **138.65** Hours

Unit cost: $1.669 /LCY Total job cost: **$139,109**

Task # E100.1 Highwall Backfill Volume Estimate

PROJECT: **Parkdal Quarry**

PERMIT No.: **M-1997-054: AM-2**

HIGHWALL LOCATION: **Granite Quarries (Generic)**

DATE: **12/13/2021**

LEGEND

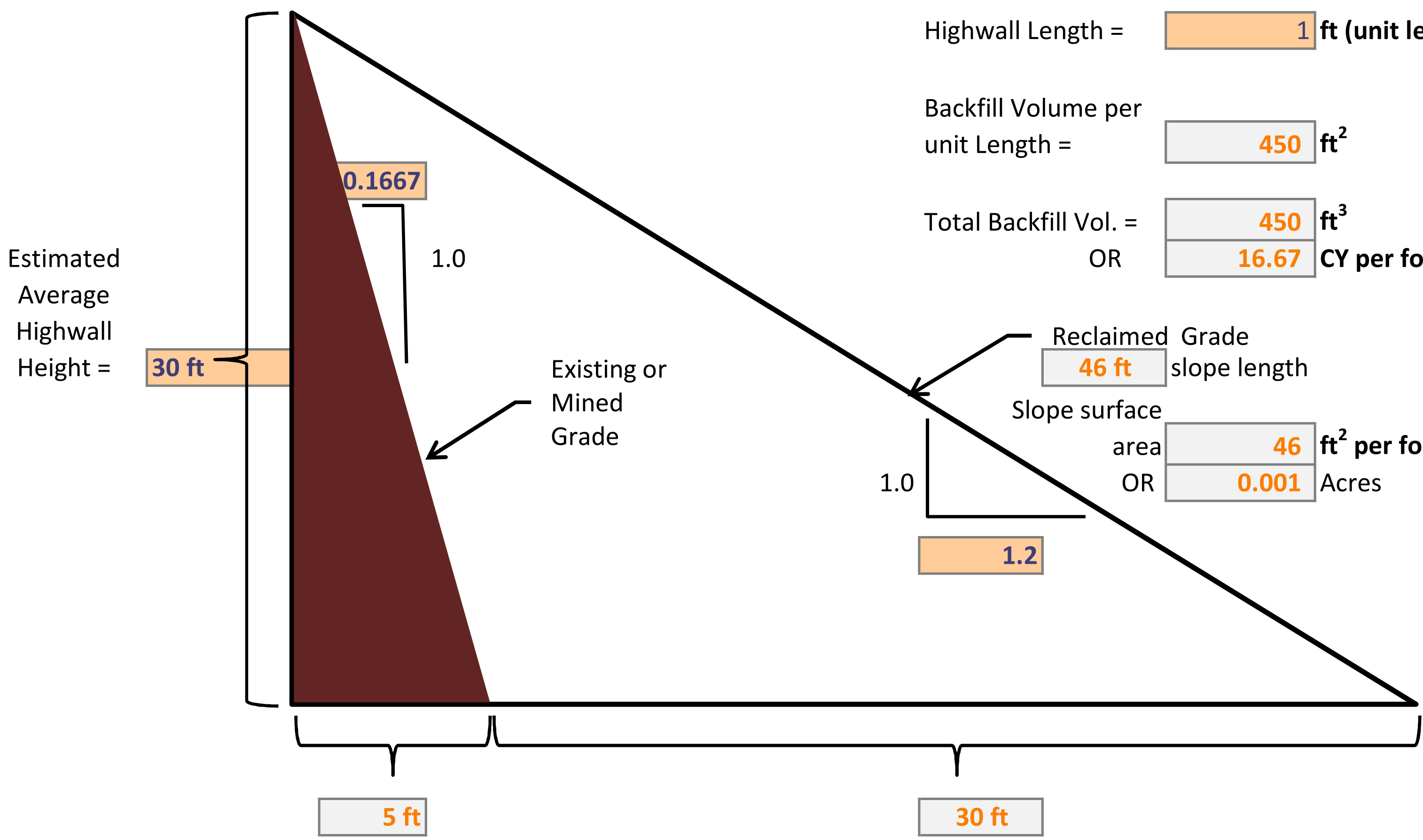
Input
Result

Highwall Length = 1 **ft (unit lengtl**

Backfill Volume per unit Length = 450 **ft^2**

Total Backfill Vol. = 450 **ft^3**

OR 16.67 **CY per foot**



HIGHWALL BACKFILL VOLUME ESTIMATE

REVEGETATION WORK

Task description: **Hydroseed 4,000 ft of benches not concurrently reclaimed**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: E105 State: Colorado Abbreviation: None
Date: 12/9/2021 County: Fremont Filename: M054-E105
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

Application

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

TILLING

Description	**Cost /Acre**
	$
Total Tilling Cost/Acre	**$0.00**

SEEDING

Seed Mix	**Rate – PLS LBS / Acre**	**Seeds per SQ. FT**	**Cost /Acre**
Alfalfa - Common	0.40	1.93	$1.02
Blue Grama - Native	2.20	35.91	$30.20
Indian Ricegrass - Native	4.20	13.60	$27.30
Canby Bluegrass - Canbar	0.40	8.50	$4.10
Sand Dropseed	0.10	11.94	$0.98
Sideoats Grama - Vaughn	3.60	11.82	$30.15
Sheep Fescue - Bighorn	0.80	12.49	$3.52
Thickspike Wheatgrass - Critana	3.20	11.31	$22.00
Western Wheatgrass - Native	4.00	10.10	$24.00

Sage, Fringed	0.06	5.01	$2.46
Sagebrush, Louisiana or Prairie	0.06	6.05	$8.01
Saltbush, Four Wing	0.20	0.28	$2.50
Spike Muhly	0.40	14.69	$3.88
Sumac, Skunkbrush	0.20	0.09	$4.20
Purple Three-Awn	0.20	2.30	$5.32
Totals Seed Mix	20.02	146.01	**$169.63**

Application

Description	**Cost /Acre**
Hydro seeding (MEANS 32 92 19.14 0200)	$965.73
Total Seed Application Cost/Acre	**$965.73**

MULCHING and MISCELLANEOUS

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
			$	$
Total Mulch Materials Cost/Acre				**$0.00**

Application

Description	**Cost /Acre**
	$
Total Mulch Application Cost/Acre	**$0.00**

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: 4

Estimated Failure Rate: 20%

*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,212.86

Cost /Acre*: $1,135.36

Initial Job Cost: **$4,851.44**

Reseeding Job Cost: **$908.29**

Total Job Cost: **$5,760**

Job Hours: **8.00**

BULLDOZER RIPPING WORK

Task description: **Rip pit floor of Phase 1**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: E110 State: Colorado Abbreviation: None
Date: 12/9/2021 County: Fremont Filename: M054-E110
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D9T - 9SU Horsepower: 405
Ripper Attachment: 3-Shank Ripper Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$126.01	NA
Operating Cost/Hour:	$141.41	100
Ripper Ownership Cost/Hour:	$19.26	NA
Ripper Operating Cost/Hour:	$11.48	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$339.46	

Total Fleet Cost/Hour: **$339.46**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 24.68 acres Rip Depth (ft): 1.00 Volume: 39,817 BCY or CCY

Source of estimated quantity: AM-2, Exh D2 Map

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

Average Ripping Depth:	2.63	feet/pass
Average Ripping Width:	7.67	feet/pass
Average Ripping Length:	300.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.866	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.866	Acres/hr
Site Altitude:	6,800	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.72	Acres/hr
Adjusted Hourly Fleet Production:	**0.72**	Acres/hr

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **34.33** Hours

Unit cost: $472.176 Per acre Total job cost: **$11,653**

TRUCK/LOADER TEAM WORK

Task description: **Construct drainage channels - Remove blasted material**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	E112	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-E112
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	Cat D7R DS XR Series II
-Dump Area:	CAT 928Hz
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	75	100	100	100
Ownership cost/hour:	$88.53	$67.72	$81.02	$30.09	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	$59.50	$29.87	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	$0.00	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	$0.00	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	$41.30	$40.71	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	$181.82	$100.67	$149.73	$129.11
Number of Units:	2	1	1	1	1	1
Group Subtotals:	Work: $550.57		Support: $282.49		Maint: $278.84	

Total work team cost/hour: **$1,111.90**

MATERIAL QUANTITIES

Initial volume: 9,778 CCY Swell factor: 1.320
Loose volume: **12,907** LCY

Source of estimated volume: AM2, Exh L, p. 2 - PAR resp. (assume trucked to conveyor)
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,800 Pounds/LCY
Description: Granite - Broken
Rated Payload: 87,000 Pounds
Payload Capacity: 31.07 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.07	LCY

Final Truck Volume Based on Number of Loader Passes: **26.25** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	0.875	Blasted rock - well blasted (80 - 95%) 0.875
Adjusted Capacity:	**6.563**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	Loader	Source
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA

Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Bank or broken material 0.04	0.040	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.040	minutes
	Adjusted Loader Cycle Time:	**0.510**	minutes
	Net Load Time per Truck:	**1.630**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.630	Minutes	Adjusted for site altitude:	1.630	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	-2.00	4.00	2.00	3005	0.962

Haul Time: **0.962** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	2.00	4.00	6.00	2742	0.769

Return Time: **0.769** minutes
Total Truck Cycle Time: **5.028** minutes

Loading Tool unit Production 698.45 LCY/Hour   Adjusted for job efficiency: 579.71 LCY/Hour
Truck Unit Production 313.27 LCY/Hour   Adjusted for job efficiency: 260.01 LCY/Hour

Optimal No. of Trucks: 2 Truck(s)   Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 520.02 LCY/Hour
Adjusted single truck/loader team production: 520.02 LCY/Hour
Adjusted multiple truck/loader team production: **520.02** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s)   Total job time: **24.82** Hours

Unit cost: $2.138 /LCY   Total job cost: **$27,597**

TRUCK/LOADER TEAM WORK

Task description: **Topsoil pit floor of Phase 1 (9 inches)**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	E115	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-E115
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	CAT 160M
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$88.53	$67.72	NA	$66.63	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$54.54	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$28.56	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$149.73	$149.73	$129.11
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$550.57	Support:	$149.73	Maint:	$278.84

Total work team cost/hour: **$979.14**

MATERIAL QUANTITIES

Initial volume: 29,863 CCY Swell factor: 1.429
Loose volume: **42,662** LCY

Source of estimated volume: AM-2, Exh L, p. 3
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 1,600 Pounds/LCY
Description: Top Soil
Rated Payload: 87,000 Pounds
Payload Capacity: 54.38 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections:

Site Altitude (ft.): 5800 feet

	Truck	**Loader**	**Source**
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time:

Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA

Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders -0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
2	1500.00	2.00	4.00	6.00	1566	1.213

Haul Time: **1.213** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1500.00	-2.00	4.00	2.00	3005	0.645

Return Time: **0.645** minutes
Total Truck Cycle Time: **5.095** minutes

Loading Tool unit Production 840.55 LCY/Hour — Adjusted for job efficiency: 697.65 LCY/Hour
Truck Unit Production 362.14 LCY/Hour — Adjusted for job efficiency: 300.58 LCY/Hour

Optimal No. of Trucks: 2 Truck(s) — Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 601.16 LCY/Hour
Adjusted single truck/loader team production: 601.16 LCY/Hour
Adjusted multiple truck/loader team production: **601.16** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) — Total job time: **70.97** Hours

Unit cost: $1.629 /LCY — Total job cost: **$69,486**

REVEGETATION WORK

Task description: **Reveg pit floor of Phase 1**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: E120 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-E120
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alfalfa - Common	0.20	0.96	$0.51
Blue Grama - Native	1.10	17.95	$15.10
Indian Ricegrass - Native	2.10	6.80	$13.65
Canby Bluegrass - Canbar	0.20	4.25	$2.05
Sand Dropseed	0.05	5.97	$0.49
Sideoats Grama - Vaughn	1.80	5.91	$15.08
Sheep Fescue - Bighorn	0.40	6.24	$1.76
Thickspike Wheatgrass - Critana	1.60	5.66	$11.00
Western Wheatgrass - Native	2.00	5.05	$12.00
Sage, Fringed	0.03	2.51	$1.23

Sagebrush, Louisiana or Prairie	0.03	3.02	$4.01
Saltbush, Four Wing	0.10	0.14	$1.25
Spike Muhly	0.20	7.35	$1.94
Sumac, Skunkbrush	0.10	0.05	$2.10
Purple Three-Awn	0.10	1.15	$2.66
Totals Seed Mix	10.01	73.01	**$84.82**

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**
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	**Cost /Acre**
Crimping, with tractor {DMG survey data}	$71.57
Total Mulch Application Cost/Acre	**$71.57**

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: 24.68
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,233.26
Cost /Acre*: $316.82

Initial Job Cost: **$30,436.86**
Reseeding Job Cost: **$1,563.82**
Total Job Cost: **$32,001**
Job Hours: **50.00**

TRUCK/LOADER TEAM WORK

Task description: **Backfill 1,000 ft of benches not concurrently reclaimed**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: G100 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-G100
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D6T LGP
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	50
Ownership cost/hour:	$88.53	$67.72	NA	$66.27	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$66.34	$54.54	$37.62
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$41.30	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$173.91	$149.73	$91.50
Number of Units:	3	1	0	1	1	1
Group Subtotals:	Work:	$737.83	Support:	$173.91	Maint:	$241.23

Total work team cost/hour: **$1,152.97**

MATERIAL QUANTITIES

Initial volume: 16,670 CCY Swell factor: 1.250
Loose volume: **20,838** LCY

Source of estimated volume: Assume 1,000 ft benches; Tsk E100.1
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,650 Pounds/LCY
Description: Decomposed rock - 25% Rock, 75% Earth
Rated Payload: 87,000 Pounds
Payload Capacity: 32.83 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections:

Site Altitude (ft.): 5800 feet

	Truck	Loader	Source
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time:

Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA
Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3500.00	5.00	4.00	9.00	983	3.651

Haul Time: **3.651** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3500.00	-5.00	4.00	-1.00	3706	0.974

Return Time: **0.974** minutes
Total Truck Cycle Time: **7.862** minutes

Loading Tool unit Production 840.55 LCY/Hour Adjusted for job efficiency: 697.65 LCY/Hour
Truck Unit Production 234.68 LCY/Hour Adjusted for job efficiency: 194.79 LCY/Hour

Optimal No. of Trucks: 4 Truck(s) Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 584.36 LCY/Hour
Adjusted single truck/loader team production: 584.36 LCY/Hour
Adjusted multiple truck/loader team production: **584.36** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **35.66** Hours

Unit cost: $1.973 /LCY Total job cost: **$41,113**

REVEGETATION WORK

Task description: **Hydroseed 1,000 ft of benches not concurrently reclaimed**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: G105 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-G105
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

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)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	**Rate – PLS LBS / Acre**	**Seeds per SQ. FT**	**Cost /Acre**
Alfalfa - Common	0.40	1.93	$1.02
Blue Grama - Native	2.20	35.91	$30.20
Indian Ricegrass - Native	4.20	13.60	$27.30
Canby Bluegrass - Canbar	0.40	8.50	$4.10
Sand Dropseed	0.10	11.94	$0.98
Sideoats Grama - Vaughn	3.60	11.82	$30.15
Sheep Fescue - Bighorn	0.80	12.49	$3.52
Thickspike Wheatgrass - Critana	3.20	11.31	$22.00
Western Wheatgrass - Native	4.00	10.10	$24.00

Sage, Fringed	0.06	5.01	$2.46
Sagebrush, Louisiana or Prairie	0.06	6.05	$8.01
Saltbush, Four Wing	0.20	0.28	$2.50
Spike Muhly	0.40	14.69	$3.88
Sumac, Skunkbrush	0.20	0.09	$4.20
Purple Three-Awn	0.20	2.30	$5.32
Totals Seed Mix	20.02	146.01	**$169.63**

Application

Description	**Cost /Acre**
Hydro seeding (MEANS 32 92 19.14 0200)	$965.73
Total Seed Application Cost/Acre	**$965.73**

MULCHING and MISCELLANEOUS

Materials

Description	**Units / Acre**	**Unit**	**Cost / Unit**	**Cost /Acre**
			$	$
Total Mulch Materials Cost/Acre				**$0.00**

Application

Description	**Cost /Acre**
	$
Total Mulch Application Cost/Acre	**$0.00**

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: 1
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,327.42
Cost /Acre*: $1,135.36

Initial Job Cost: **$1,327.42**
Reseeding Job Cost: **$227.07**
Total Job Cost: **$1,554**
Job Hours: **4.00**

BULLDOZER RIPPING WORK

Task description: **Rip existing granite pit floor**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	G110	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-G110
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D9T - 9SU	Horsepower:	405
Ripper Attachment:	3-Shank Ripper	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$126.01	NA
Operating Cost/Hour:	$141.41	100
Ripper Ownership Cost/Hour:	$19.26	NA
Ripper Operating Cost/Hour:	$11.48	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$339.46	

Total Fleet Cost/Hour: **$339.46**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic:	NA		Bank Volume:	NA	BCY	NA	
Area:	23.14	acres	Rip Depth (ft):	1.00	Volume:	37,333	BCY or CCY

Source of estimated quantity: AM-2, Exh D2 Map

HOURLY PRODUCTION

Seismic:

Seismic Velocity:	NA	feet/second

Area:

Average Ripping Depth:	2.63	feet/pass
Average Ripping Width:	7.67	feet/pass
Average Ripping Length:	300.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.866	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.866	Acres/hr
Site Altitude:	6,800	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.72	Acres/hr
Adjusted Hourly Fleet Production:	**0.72**	Acres/hr

JOB TIME AND COST

Fleet size:	1	Grader(s)	Total job time:	**32.19**	Hours
Unit cost:	$472.176	Per acre	Total job cost:	**$10,926**	

TRUCK/LOADER TEAM WORK

Task description: **Topsoil existing pit floor (9 inches x 23.14 Ac)**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: G115 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-G115
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	CAT 160M
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	100	100	100
Ownership cost/hour:	$88.53	$67.72	NA	$66.63	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$54.54	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$28.56	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$149.73	$149.73	$129.11
Number of Units:	3	1	0	1	1	1
Group Subtotals:	Work:	$737.83	Support:	$149.73	Maint:	$278.84

Total work team cost/hour: **$1,166.40**

MATERIAL QUANTITIES

Initial volume: 27,999 CCY Swell factor: 1.429
Loose volume: **39,999** LCY

Source of estimated volume: AM-2, Exh D2 Map
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 1,600 Pounds/LCY
Description: Top Soil
Rated Payload: 87,000 Pounds
Payload Capacity: 54.38 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	**Loader**	**Source**
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA

Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
2	4800.00	3.00	4.00	7.00	1281	3.901

Haul Time: **3.901** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	4800.00	-3.00	4.00	1.00	3706	1.499

Return Time: **1.499** minutes
Total Truck Cycle Time: **8.637** minutes

Loading Tool unit Production 840.55 LCY/Hour Adjusted for job efficiency: 697.65 LCY/Hour
Truck Unit Production 213.62 LCY/Hour Adjusted for job efficiency: 177.31 LCY/Hour

Optimal No. of Trucks: 4 Truck(s) Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 531.92 LCY/Hour
Adjusted single truck/loader team production: 531.92 LCY/Hour
Adjusted multiple truck/loader team production: **531.92** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **75.20** Hours

Unit cost: $2.193 /LCY Total job cost: **$87,710**

REVEGETATION WORK

Task description: **Reveg existing granite pit floor**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: G120 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-G120
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alfalfa - Common	0.20	0.96	$0.51
Blue Grama - Native	1.10	17.95	$15.10
Indian Ricegrass - Native	2.10	6.80	$13.65
Canby Bluegrass - Canbar	0.20	4.25	$2.05
Sand Dropseed	0.05	5.97	$0.49
Sideoats Grama - Vaughn	1.80	5.91	$15.08
Sheep Fescue - Bighorn	0.40	6.24	$1.76
Thickspike Wheatgrass - Critana	1.60	5.66	$11.00
Western Wheatgrass - Native	2.00	5.05	$12.00
Sage, Fringed	0.03	2.51	$1.23

Sagebrush, Louisiana or Prairie	0.03	3.02	$4.01
Saltbush, Four Wing	0.10	0.14	$1.25
Spike Muhly	0.20	7.35	$1.94
Sumac, Skunkbrush	0.10	0.05	$2.10
Purple Three-Awn	0.10	1.15	$2.66
Totals Seed Mix	10.01	73.01	**$84.82**

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**
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	**Cost /Acre**
Crimping, with tractor {DMG survey data}	$71.57
Total Mulch Application Cost/Acre	**$71.57**

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: 23.14
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,233.26
Cost /Acre*: $316.82

Initial Job Cost: **$28,537.64**
Reseeding Job Cost: **$1,466.24**
Total Job Cost: **$30,004**
Job Hours: **50.00**

COMPACTION WORK

Task description: **Sitewide cleanup - 151 hrs of Compactor work**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: SW01 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-SW01
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT PS-150C (2004) Horsepower: 96
Compactor Type: Pneumatic static (asphalt) Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$45.37	NA
Operating Cost/Hour:	$18.61	100
Operator Cost/Hour:	$26.02	NA
Total Unit Cost/Hour:	$90.00	
Total Fleet Cost/Hour:	**$90.00**	

MATERIAL QUANTITIES

Loose volume: 167,000 LCY Shrinkage factor: 0.900
Compacted volume: **150,300** CCY

Source of estimated volume: Material vol. adjusted to get 151 hrs (1/hr per acre)
Source of estimated shrinkage factor: Cat Handbook

HOURLY PRODUCTION

Unadjusted hourly production = (W x S x L x C) / P

Compacted width per pass (W):	5.67	feet
Average Compactor Speed (S):	4.00	mph
Compacted thickness of each lift (L):	8.00	inches
Conversion Constant (C):	16.3	(5,280ft./12in./27cu.ft.)
Required number of machine passes (P):	2	passes
Unadjusted Hourly Unit Production:	1,478.74	CCY/hour

Job Condition Correction Factors Site Altitude: 6,800 feet

		Source
Altitude Adj:	0.81	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.6723	multiplier

Adjusted Hourly Unit Production: 994.15 CCY/Hour
Adjusted Hourly Fleet Production: **994.15** CCY/Hour

JOB TIME AND COST

Fleet size: 1 Compactor(s) Total job time: **151.18** Hours

Unit cost: $0.091 per CCY Total job cost: **$13,607**

MOTOR GRADER WORK

Task description: **Sitewide cleanup ~$150/hr grader**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	SW02	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-SW02
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	CAT 160M	Horsepower:	213
Ripper Attachment:		Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$66.63	NA
Operating Cost/Hour:	$54.54	100
Ripper Ownership Cost/Hour:	$0.00	NA
Ripper Operating Cost/Hour:	$0.00	
Operator Cost/Hour:	$28.56	NA
Total Unit Cost/Hour:	$149.73	

Total Fleet Cost/Hour: **$149.73**

MATERIAL QUANTITIES

Total Area to be graded or ripped: 151.00 acres

Source of estimated acreage: AM2 Exh L, p. 8

HOURLY PRODUCTION

Average Grader Speed:	1.50	mph
Selected Application:	Finish grading (0-2.5 mph) - 1.5	
Selected Blade Angle:	45	degrees
Effective Blade Length:	8.50	feet
Width of blade overlap per pass:	2.00	feet
Net grading or ripping width per pass:	6.50	feet
Unadjusted Hourly Unit Production:	1.1818	acres/hour

Job Condition Correction Factors

Site Altitude: 6800 feet

		Source
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.85	(1sh/d, mod.)
Net Correction:	0.8500	multiplier

Adjusted Hourly Unit Production:	1.0045	acres/Hour
Adjusted Hourly Fleet Production:	**1.0045**	acres/Hour

JOB TIME AND COST

Fleet size:	1	Grader(s)	Total job time:	**150.32**	Hours
Unit cost:	$149.05	per acre	Total job cost:	**$22,507**	

DOZERGRADER WORK

Task description: **Sitewide cleanup D7 dozer**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	SW03	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-SW03
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D7R DS Series II LGP
Horsepower:
Blade Type:
Attachment: NA
Shift Basis: 1 per day
Data Source:

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$81.02	NA
Operating Cost/Hour:	$79.33	100
Ripper own. Cost/Hour:	$0.00	NA
Ripper op. Cost/Hour:	$0.00	0
Operator Cost/Hour:	$41.30	NA

Total unit Cost/Hour: $201.65
Total Fleet Cost/Hour: **$201.65**

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $201.65/LCY

Total job time: **151.00** Hours
Total job cost: **$30,449**

MISCELLANEOUS TRUCK WORK

Task description: **Sitewide cleanup Water Truck**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	SW04	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-SW04
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Make and Model:	Water Tanker, 7,000 Gal.	Horsepower:	330
Attachment 1:		Shift Basis:	1 per day
Attachment 2:		Weight:	29.65
Labor Unit 1:	Tanker Driver - 1 rear axle		(US Tons)
Labor Unit 2:			

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$53.88	NA
Operating Cost/Hour:	$75.23	100
Operator Cost/Hour:	$21.12	NA
Total Unit Cost/Hour:	$150.23	
Total Fleet Cost/Hour:	$150.23	

JOB TIME AND COST

Fleet size:	1	Truck(s)	Total job time:	**151.00**	Hours
Unit cost:	$150.23	/Hour	Total job cost:	**$22,685**	

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mob/Demob equipment**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	SW99	State:	Colorado	Abbreviation:	None
Date:	12/13/2021 10:39:56 AM	County:	Fremont	Filename:	M054-SW99
User:	TC1				

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:	$21.28	$37.94	$47.67
Operating Cost/Hour:	$26.55	$50.48	$56.21
Operator Cost/Hour:	$20.54	$20.54	$20.54
Helper Cost/Hour:	$0.00	$23.53	$23.53
Total Unit Cost/Hour:	$68.37	$132.49	$147.95

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 627G	41.80	$154.27	$132.49	2	$573.52	$264.98	$500.00
Cat 637G	57.28	$218.34	$147.95	2	$732.58	$295.90	$500.00
Cat D6T LGP	26.87	$66.27	$132.49	1	$198.76	$132.49	$250.00
Cat D7R DS Series II LGP	34.57	$81.02	$132.49	1	$213.51	$132.49	$250.00
Cat D8T - 8SU	47.71	$97.46	$132.49	1	$229.95	$132.49	$250.00
Cat D9T - 9SU	60.01	$126.01	$147.95	1	$273.96	$147.95	$250.00
Cat 740	36.49	$88.53	$132.49	3	$663.06	$397.47	$750.00
Cat 775F	50.39	$121.36	$132.49	2	$507.70	$264.98	$500.00
CAT 160M	17.53	$66.63	$68.37	2	$270.00	$136.74	$500.00
Water Tanker, 7,000 Gal.	29.65	$53.88	$132.49	1	$186.37	$132.49	$250.00
CAT 928Hz	13.91	$30.09	$68.37	1	$98.46	$68.37	$250.00
CAT 980H	33.12	$67.72	$132.49	1	$200.21	$132.49	$250.00
CAT 990H	83.34	$116.41	$147.95	1	$264.36	$147.95	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$7.98	$68.37	1	$76.35	$68.37	$250.00
CAT PS-150C (2004)	5.39	$45.37	$68.37	1	$113.74	$68.37	$250.00
CAT 836H	54.88	$223.80	$147.95	1	$371.75	$147.95	$250.00
				Subtotals:	**$4,974.28**	**$2,671.48**	**$5,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Hydroseeder with Tractor	$26.18	1	$26.18	$26.18
		Subtotals:	**$26.18**	**$26.18**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	COLORADO SPRINGS	
Total one-way travel distance:	58.00	miles
Average Travel Speed:	45.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$35,683.35	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$67.49	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	1.29	1.29
Return Time (Hours):	1.29	1.29
Loading Time (Hours):	0.25	NA
Unloading Time (Hours):	0.25	NA
Subtotals:	3.08	2.58

JOB TIME AND COST

Total job time: **6.16** Hours

Total job cost: **$35,751**

DEMOLITION WORK

Task description: **Demo plant concrete support structures & conveyor**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: WG02
Date: 12/10/2021
User: TC1

State: Colorado
County: Fremont

Abbreviation: None
Filename: M054-WG02

Agency or organization name: DRMS

UNIT COSTS

Location adjustment: 88.00 %

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Concrete support structures	2' x 3'	Demo. and on-site disposal in excavated pit, 2.0 ft. x 3 ft. - Max. 50 ft. push	90.00	LF	$12.25	$1,102.50
Conveyor	232'	Conveyor, Horizontal Belt 24" Belt, 61.5' Length	3.75	EA	$3,125.00	$11,718.75

Job Hours: **0.00**

Subtotal (unadjusted): **$12,821.25**

Total Cost (adjusted for location): **$11,282.70**

BULLDOZER RIPPING WORK

Task description: **Scarify compacted ground**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #:	WG04	State:	Colorado	Abbreviation:	None
Date:	12/10/2021	County:	Fremont	Filename:	M054-WG04
User:	TC1				

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine:	Cat D9T - 9SU	Horsepower:	405
Ripper Attachment:	3-Shank Ripper	Shift Basis:	1 per day
		Data Source:	(CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$126.01	NA
Operating Cost/Hour:	$141.41	100
Ripper Ownership Cost/Hour:	$19.26	NA
Ripper Operating Cost/Hour:	$11.48	100
Operator Cost/Hour:	$41.30	NA
Total Unit Cost/Hour:	$339.46	

Total Fleet Cost/Hour: **$339.46**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic:	NA		Bank Volume:	NA	BCY	NA	
Area:	26.00	acres	Rip Depth (ft):	1.00	Volume:	41,947	BCY or CCY

Source of estimated quantity: AM-1, Exh L, Aspect G

HOURLY PRODUCTION

Seismic:

Seismic Velocity:	NA	feet/second

Area:

Average Ripping Depth:	2.63	feet/pass
Average Ripping Width:	7.67	feet/pass
Average Ripping Length:	300.00	feet/pass
Average Dozer Speed:	88.00	feet/minute
Average Maneuver Time:	0.25	minutes/pass
Production per unit area:	0.866	acres/hour

Job Condition Correction Factors

Unadjusted Hourly Unit Production:	0.866	Acres/hr
Site Altitude:	6,800	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier
Adjusted Hourly Unit Production:	0.72	Acres/hr
Adjusted Hourly Fleet Production:	**0.72**	Acres/hr

JOB TIME AND COST

Fleet size:	1	Grader(s)	Total job time:	**36.16**	Hours
Unit cost:	$472.176	Per acre	Total job cost:	**$12,277**	

TRUCK/LOADER TEAM WORK

Task description: **Replace topsoil (6 in x 26 Ac)**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: WG05 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-WG05
User: TC1

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Cat 740
-Loader:	CAT 980H
Support Equipment -Load Area:	NA
-Dump Area:	CAT 160M
Road Maintenance –Motor Grader:	CAT 160M
-Water Truck:	Water Tanker, 7,000 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	NA	50	100	100
Ownership cost/hour:	$88.53	$67.72	NA	$66.63	$66.63	$53.88
Operating cost/hour:	$65.75	$67.62	NA	$27.27	$54.54	$75.23
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	$0.00	$0.00	$0.00
Operator cost/hour:	$32.98	$40.71	NA	$28.56	$28.56	$0.00
Unit Subtotals:	$187.26	$176.05	NA	$122.46	$149.73	$129.11
Number of Units:	3	1	0	1	1	1
Group Subtotals:	Work:	$737.83	Support:	$122.46	Maint:	$278.84

Total work team cost/hour: **$1,139.13**

MATERIAL QUANTITIES

Initial volume: 20,973 CCY Swell factor: 1.429
Loose volume: **29,962** LCY

Source of estimated volume: AM-1, Exh L, Aspect G
Source of estimated swell factor: Cat Handbook
Material Purchase Cost: $0.00
Total Cost: $0.00

HOURLY PRODUCTION

Truck Capacity:

Truck Payload (weight) Basis:

Material weight: 1,600 Pounds/LCY
Description: Top Soil
Rated Payload: 87,000 Pounds
Payload Capacity: 54.38 LCY

Truck Bed (volume) Basis:

Struck Volume:	24.20	LCY
Heaped Volume:	31.40	LCY
Average Volume:	27.80	LCY
Adjusted Volume:	31.40	LCY

Final Truck Volume Based on Number of Loader Passes: **30.75** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	7.500	LCY (heaped)
Bucket Fill Factor:	1.025	Rock - Earth Mixture (100%-105%) 1.025
Adjusted Capacity:	**7.688**	LCY

Job Condition Corrections: Site Altitude (ft.): 5800 feet

	Truck	**Loader**	**Source**
Altitude Adj:	0.960	1.000	(CAT HB)
Job Efficiency:	0.830	0.830	(CAT HB)
Net Correction:	**0.797**	**0.830**	

Loading Tool Cycle Time: Number of Loading Tool Passes Required to Fill Truck: 4 passes

Excavators and Front Shovels:

Machine Cycle Time vs. Job Condition Rating: NA
Selected Value within this Basic Rating: NA

Track Loaders – Material Description:

Cycle Time Elements (min.):

Load: NA Maneuver: NA Dump: 0.100

Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.550 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Mixed material 0.02	0.020	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(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:	-0.060	minutes
	Adjusted Loader Cycle Time:	**0.490**	minutes
	Net Load Time per Truck:	**1.570**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.60	Minutes	Adjusted for site altitude:	0.625	Minutes
Truck Load Time:	1.570	Minutes	Adjusted for site altitude:	1.570	Minutes
Truck Maneuver and Dump Time:	1.00	Minutes	Adjusted for site altitude:	1.042	Minutes

Truck Travel (Haul & Return) Time: Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
2	3000.00	0.00	4.00	4.00	2421	1.865

Haul Time: **1.865** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	3000.00	0.00	4.00	4.00	3005	1.195

Return Time: **1.195** minutes
Total Truck Cycle Time: **6.297** minutes

Loading Tool unit Production 840.55 LCY/Hour — Adjusted for job efficiency: 697.65 LCY/Hour
Truck Unit Production 293.01 LCY/Hour — Adjusted for job efficiency: 243.20 LCY/Hour

Optimal No. of Trucks: 3 Truck(s) — Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 729.60 LCY/Hour
Adjusted single truck/loader team production: 697.65 LCY/Hour
Adjusted multiple truck/loader team production: **697.65** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) — Total job time: **42.95** Hours

Unit cost: $1.633 /LCY — Total job cost: **$48,922**

REVEGETATION WORK

Task description: **Seed and Mulch plant area**

Site: **Parkdale Quarry** Permit Action: AM-02 Permit/Job#: M1997054

PROJECT IDENTIFICATION

Task #: WG06 State: Colorado Abbreviation: None
Date: 12/10/2021 County: Fremont Filename: M054-WG06
User: TC1

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	125.00	pound	$0.36	$45.00
Superphosphate, 0-20-0 with 12% S	125.00	pound	$0.26	$32.50
			Total Fertilizer Materials Cost/Acre	**$77.50**

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	$38.77
Total Fertilizer Application Cost/Acre	**$38.77**

TILLING

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	$114.56
Total Tilling Cost/Acre	**$114.56**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alfalfa - Common	0.20	0.96	$0.51
Blue Grama - Native	1.10	17.95	$15.10
Indian Ricegrass - Native	2.10	6.80	$13.65
Canby Bluegrass - Canbar	0.20	4.25	$2.05
Sand Dropseed	0.05	5.97	$0.49
Sideoats Grama - Vaughn	1.80	5.91	$15.08
Sheep Fescue - Bighorn	0.40	6.24	$1.76
Thickspike Wheatgrass - Critana	1.60	5.66	$11.00
Western Wheatgrass - Native	2.00	5.05	$12.00
Sage, Fringed	0.03	2.51	$1.23

Sagebrush, Louisiana or Prairie	0.03	3.02	$4.01
Saltbush, Four Wing	0.10	0.14	$1.25
Spike Muhly	0.20	7.35	$1.94
Sumac, Skunkbrush	0.10	0.05	$2.10
Purple Three-Awn	0.10	1.15	$2.66
Totals Seed Mix	10.01	73.01	**$84.82**

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**
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$307.02	$614.04
Total Mulch Materials Cost/Acre				**$614.04**

Application

Description	**Cost /Acre**
Crimping, with tractor {DMG survey data}	$71.57
Total Mulch Application Cost/Acre	**$71.57**

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: 26
Estimated Failure Rate: 20%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,233.26
Cost /Acre*: $316.82

Initial Job Cost: **$32,064.76**
Reseeding Job Cost: **$1,647.46**
Total Job Cost: **$33,712**
Job Hours: **50.00**