



STATE OF
COLORADO

Carter - DNR, Jocelyn <jocelyn.carter@state.co.us>

Two Rivers Pit M-1998-038 AM1 Reclamation Cost Estimate

1 message

Carter - DNR, Jocelyn <jocelyn.carter@state.co.us>

Mon, Aug 26, 2024 at 8:08 PM

To: Jodi Schreiber <jodi@arycorp.com>

Cc: Amy Eschberger - DNR <amy.eschberger@state.co.us>, John Paul Ary <Jp@arycorp.com>

Hi Jodi,

Please see the attached reclamation cost estimate calculated for the AM1 application.

Thanks,
Jocelyn

--

Jocelyn Carter
Environmental Protection Specialist
Division of Reclamation, Mining, and Safety
1313 Sherman St Suite 215
Denver, CO 80203
cell: (720) 666-1065



20240826_M1998038_AM1_RCE.pdf

638K

COST SUMMARY WORK

Task description: _____

Site: Two Rivers

Permit Action: 2024 AM1

Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 000

State: Colorado

Abbreviation: None

Date: 8/26/2024

County: Pueblo

Filename: M038-000

User: JLC

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Grade Highwalls, 1000' L and 45' H, 3H:1V Pushdown	DOZER	4	21.55	\$18,948
002	Reclaim Highwall in the 200' buffer zone	LOADER	2	60.84	\$15,658
003	Spread 18" of topsoil over 63.3 acres	SCRAPER1	1	89.36	\$340,546
004	Revegetation of 63.3 acres	REVEGE	1	32.00	\$135,826
005	Mob	MOBILIZE	1	8.08	\$30,511
<u>SUBTOTALS:</u>				211.83	\$541,489

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance: 2.02

Total = \$10,938

Performance bond: 1.05

Total = \$5,686

Job superintendent: 105.92

Total = \$8,396

Profit: 10.00

Total = \$54,149

TOTAL O & P = \$79,168

CONTRACT AMOUNT (direct + O & P) = \$620,657

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs): \$500

Total = \$500

Engineering work and/or contract/bid preparation: 4.25

Total = \$26,378

Reclamation management and/or administration: 5.00

\$31,033

CONTINGENCY: 0.00

Total = \$0

TOTAL INDIRECT COST = \$137,079

TOTAL BOND AMOUNT (direct + indirect) = \$678,568

BULLDOZER WORKTask description: **Grade Highwalls, 1000' L and 45' H, 3H:1V Pushdown**Site: **Two Rivers**Permit Action: **2024 AM1**Permit/Job#: **M1998038****PROJECT IDENTIFICATION**Task #: **001**State: **Colorado**Abbreviation: **None**Date: **8/23/2024**County: **Pueblo**Filename: **M038-001**User: **JLC**Agency or organization name: **DRMS****HOURLY EQUIPMENT COST**Basic Machine: **Cat D7R DS XR Series II**Horsepower: **240**Blade Type: **Semi-Universal**Attachment: **3-shank ripper**Shift Basis: **1 per day**Data Source: **(CRG)****Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$90.24	NA
Operating Cost/Hour:	\$78.95	100
Ripper own. Cost/Hour:	\$9.25	NA
Ripper op. Cost/Hour:	\$1.30	25
Operator Cost/Hour:	\$40.04	NA

Total unit Cost/Hour: **\$219.78**Total Fleet Cost/Hour: **\$879.10****MATERIAL QUANTITIES**Initial Volume: **22,786**Swell factor: **1.430**Loose volume: **32,584 LCY**Source of estimated volume: **4098ft msrd HW,(ex. 200' area) 20' estimated max hw height**Source of estimated swell factor: **Cat Handbook****HOURLY PRODUCTION**Average push distance: **70 feet**Unadjusted hourly production: **887.8 LCY/hr**Materials consistency description: **Rock, well ripped or blasted 0.8**Average push gradient: **-5 %**Average site altitude: **4,500 feet**Material weight: **3,300 lbs/LCY**Weight description: **Decomposed rock - 75% Rock, 25% Earth****Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.100	(50% SL)

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	1.000	(DOZ-OC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.697	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4257

Adjusted unit production: 377.94 LCY/hr

Adjusted fleet production: **1511.76 LCY/hr**

JOB TIME AND COST

Fleet size: 4 Dozer(s)

Unit cost: \$0.582/LCY

Total job time: **21.55 Hours**

Total job cost: **\$18,948**

WHEEL LOADER – LOAD AND CARRY WORKTask description: Reclaim Highwall in the 200' buffer zoneSite: Two RiversPermit Action: 2024 AM1Permit/Job#: M1998038**PROJECT IDENTIFICATION**Task #: 002State: ColoradoAbbreviation: NoneDate: 8/26/2024County: PuebloFilename: M038-002User: JLCAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: CAT 950HAttachment 1: ROPS CabHorsepower: 197Shift Basis: 1 per dayData Source: (CRG)**Cost Breakdown:**

		Utilization %
Ownership Cost/Hour:	\$36.61	NA
Operating Cost/Hour:	\$35.43	100
Operator Cost/Hour:	\$56.64	NA
Total Unit Cost/Hour:	\$128.68	
Total Fleet Cost/Hour:	\$257.35	

MATERIAL QUANTITIESInitial volume: 19,000

CCY

Swell factor: 1.250Loose volume: 23,750

LCY

Source of estimated volume: Division of Reclamation, Mining & SafetySource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Loader Cycle Time: Unadjusted Basic Cycle Time (load, dump, maneuver): 0.500 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 Basic Cycle Time:		0.460	minutes

Rolling Resistance – Road ConditionsHaul: Firm, smooth, rolling, dirt/lit. surfaced, watered, maintained 3.0Return: Firm, smooth, rolling, dirt/lit. surfaced, watered, maintained 3.0**Haul and Return Time**

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	475	0.00	3.00	3.00	0.3861	(Cat HB)
Return Route:	475	0.00	3.00	3.00	0.3608	(Cat HB)

Total Travel Time: 0.7469 minutes
 Total Cycle Time: 1.2069 minutes

Load Bucket Capacity

Rated Capacity: 4.30 LCY (heaped)
 Bucket Fill Factor: 1.100 Other - rock/dirt mixtures (100-120%) 1.100
 Adjusted Capacity: 4.73 LCY

Job Condition Correction Factors

Site Altitude: 4500 feet

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

Unadjusted Hourly Unit Production: 235.15 LCY/Hour
 Adjusted Hourly Unit Production: 195.18 LCY/Hour
 Adjusted Hourly Fleet Production: 390.35 LCY/Hour

JOB TIME AND COST

Fleet size: 2 Loader(s) Total job time: 60.84 Hours
 Unit cost: \$0.659 /LCY Total job cost: \$15,658

SCRAPER TEAM WORKTask description: **Spread 18" of topsoil over 63.3 acres**Site: **Two Rivers**Permit Action: 2024 AM1Permit/Job#: M1998038**PROJECT IDENTIFICATION**Task #: 003State: ColoradoAbbreviation: NoneDate: 8/26/2024County: PuebloFilename: 003User: JLCAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

	Equipment Description
-Scraper:	Cat 637G
-Dozer:	Cat D7R DS XR Series II
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	CAT 14M
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:**Scraper Work Team****Support Equipment****Maintenance Equipment**

	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	25	NA	NA	25	25
Ownership cost/hour:	\$329.66	\$90.24	NA	NA	\$129.81	\$17.11
Operating cost/hour:	\$347.48	\$19.74	NA	NA	\$22.28	\$9.20
%Utilization-ripper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$9.25	NA	NA	\$0.00	\$0.00
Ripper op. cost/hour:	NA	\$0.00	NA	NA	\$0.00	\$0.00
Operator cost/hour:	\$57.52	\$40.04	NA	NA	\$56.70	\$0.00
Unit Subtotals:	\$734.66	\$159.26	NA	NA	\$208.79	\$26.31
Number of Units:	4	4	0	0	1	1
Group Subtotals:	Work:	\$3,575.68	Support:	\$0.00	Maint:	\$235.10

Total work team cost/hour: **\$3,810.78****MATERIAL QUANTITIES**Initial volume: 153,186

CCY

Swell factor: 1.000Loose volume: **153,186**

LCY

Source of estimated volume: Replacing 6" of topsoil over ~99 acresSource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>2,100 lbs/LCY</u>	Struck Volume:	<u>24.00</u>	LCY
Material description:	<u>Earth - Loam</u>	Heaped Volume:	<u>34.00</u>	LCY
Rated Payload:	<u>81,600 pounds</u>	Average Volume:	<u>29.00</u>	LCY
Payload Capacity:	<u>38.86 LCY</u>	Adjusted Capacity:	<u>29.00</u>	LCY

Cycle Time:Scraper Loading Time: 0.80 MinutesManeuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4500 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: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	2.00	3.00	5.00	1867	1.18

Haul Time: 1.18 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	-2.00	3.00	1.00	2963	0.79

Return Time: 0.79 minutesTotal Scraper team cycle time: 3.37 minutesAdjusted for job conditions: 428.55 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 1,714.18 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 1,714.18 LCY/HourUnadjusted unit production/hour: 516.32 LCY/Hour

Optimal Number of Scrapers per push dozer: _____

JOB TIME AND COSTFleet size: 1 Team(s)Total job time: 89.36 HoursUnit cost: \$2.223 /LCYTotal job cost: \$340,546

REVEGETATION WORKTask description: Revegetation of 63.3 acresSite: Two RiversPermit Action: 2024 AM1Permit/Job#: M1998038**PROJECT IDENTIFICATION**Task #: 004State: ColoradoAbbreviation: NoneDate: 8/26/2024County: PuebloFilename: 004User: JLCAgency 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)	\$117.61
Weed control spraying (MEANS 31 31 16.13 3100)	\$338.80
Total Tilling Cost/Acre	\$456.41

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Millet, Foxtail - German R	15.00	28.24	\$118.68
Sorghum, Sudan - Sweetener-N-Honey	15.00	8.61	\$13.60
Totals Seed Mix	30.00	36.85	\$132.28

Application

Description	Cost /Acre
Drill Seeding (DRMS Survey Cost)	\$236.64

Total Seed Application Cost/Acre	\$236.64
---	-----------------

MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$492.78	\$985.56
Total Mulch Materials Cost/Acre				\$985.56

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$85.37
Power mulcher (MEANS 32 91 13.16 0350)	\$157.25
Total Mulch Application Cost/Acre	\$242.63

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:	63.3	Cost /Acre:	\$2,053.52
Estimated Failure Rate:	25%	Cost /Acre*:	\$368.92
*Selected Replanting Work Items:	SEEDING		

Initial Job Cost:	\$129,987.82
Reseeding Job Cost:	\$5,838.16
Total Job Cost:	\$135,826
Job Hours:	32.00

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: **Mob**Site: **Two Rivers**Permit Action: 2024 AM1Permit/Job#: M1998038**PROJECT IDENTIFICATION**Task #: 005State: ColoradoAbbreviation: NoneDate: 8/26/2024County: PuebloFilename: 005User: JLCAgency or organization name: DRMS**EQUIPMENT TRANSPORT RIG COST**Shift basis: 1 per dayCost Data Source: CRG DataTruck 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:	\$10.44	\$22.18	\$23.94
Operating Cost/Hour:	\$26.48	\$54.55	\$55.65
Operator Cost/Hour:	\$22.52	\$22.52	\$22.52
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$59.44	\$122.78	\$125.64

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 D7R DS XR Series II	35.93	\$99.49	\$122.78	4	\$889.08	\$491.12	\$250.00
Cat 637G	57.28	\$329.66	\$125.64	4	\$1,821.20	\$502.56	\$750.00
CAT 14M	23.57	\$129.81	\$59.44	1	\$189.25	\$59.44	\$250.00
Drill/Broadcast Seeder with Tractor	25.00	\$41.02	\$59.44	2	\$200.92	\$118.88	\$500.00
Power Mulcher (Bowie LD-90)	6.00	\$27.21	\$59.44	1	\$86.65	\$59.44	\$250.00
CAT 950H high lift	20.13	\$36.61	\$59.44	2	\$192.10	\$118.88	\$500.00

Subtotals: **\$3,379.20** **\$1,350.32** **\$2,500.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 3,500 Gal.	\$53.90	1	\$53.90	\$53.90
Light Duty Pickup, 4x4, 3/4 T.	\$97.64	1	\$97.64	\$97.64
Fuel Tanker, 4x2, 170 HP	\$73.01	1	\$73.01	\$73.01
Lube Truck, 4x2, 190 HP	\$80.32	1	\$80.32	\$80.32

Subtotals:	\$304.87	\$304.87
------------	-----------------	-----------------

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>PUEBLO, CO</u>	
Total one-way travel distance:	<u>26.00</u>	miles
Average Travel Speed:	<u>50.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$30,193.90</u>
** two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$317.06</u>
** one round trip, no haul rig:	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.52</u>	<u>0.52</u>
Return Time (Hours):	<u>0.52</u>	<u>0.52</u>
Loading Time (Hours):	<u>1.50</u>	<u>NA</u>
Unloading Time (Hours):	<u>1.50</u>	<u>NA</u>
Subtotals:	<u>4.04</u>	<u>1.04</u>

JOB TIME AND COST

Total job time:	<u>8.08</u>	Hours
-----------------	-------------	-------

Total job cost:	<u>\$30,511</u>
-----------------	-----------------