



March 24, 2023

Julie Mikulas  
Martin Marietta Materials, Inc.  
1800 N. Taft Hill Road  
Fort Collins, CO 80521

**Re: Martin Marietta Materials, Inc., Windsor East Mine, File No. M-2022-042,  
112c Permit Application Third Adequacy Review**

Ms. Mikulas,

The Division of Reclamation, Mining and Safety (Division/DRMS/Office) reviewed the content of the Martin Marietta Materials, Inc. 112c permit application first adequacy response dated March 3, 2023 for the Windsor East Mine, File No. M-2022-042 and submits the following comments. The Division is required to issue an approval or denial decision no later than April 17, 2023, therefore a response to the following adequacy review concerns should be submitted to the Division as soon as possible.

The review consisted of comparing the application content with the specific requirements of Rules 1, 3, 6.1, 6.2, 6.4 and 6.5 of the Minerals Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials effective date July 15, 2019. Any inadequacies are identified under the respective exhibit heading along with suggested actions to correct them.

**6.4.6 Exhibit G - Water Information**

1. On March 22, 2023, the Division sent a copy of the Summary of Adequacy Response Review letter from Eric Scott dated March 17, 2023 regarding Exhibit G. Please respond to the comments contained in the letter.

**6.4.12 Exhibit L - Reclamation Costs**

2. The Division calculated the cost for an independent contractor to reclaim the site based on the information provided by the Applicant in the permit application at \$2,300,000.00. A copy of the Division's bond estimate is attached for review.

**6.4.18 Exhibit R - Proof of Filing with County Clerk and Recorder**

3. Please provide an affidavit or receipt indicating the date on which the revised application information required to address this adequacy letter and the second adequacy letter dated March 22, 2023 were placed with the Weld County Clerk and Recorder for public review, pursuant to Subparagraph 1.6.2(1)(c).



Please be advised the Windsor East Mine application may be deemed inadequate, and the application may be denied on April 17, 2023, unless the above mentioned adequacy review items are addressed to the satisfaction of the Division. If more time is needed to complete the reply, the Division can grant an extension to the decision date. This will be done upon receipt of a written waiver of the Applicant's right to a decision by April 17, 2023 and request for additional time. This must be received no later than the decision date.

If you have any questions, please contact me at [peter.hays@state.co.us](mailto:peter.hays@state.co.us) or (303) 866-3567 Ext. 8124.

Sincerely,



Peter S. Hays  
Environmental Protection Specialist

Enclosures – Reclamation Cost Estimate

Ec: Jared Ebert; Division of Reclamation, Mining & Safety

## COST SUMMARY WORK

Task description: Windsor East Mine Bond Estimate

Site: Windsor East Mine Permit Action: 2023 Permit Application

Permit/Job#: M2022042

### PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None  
Date: 3/24/2023 County: Weld Filename: M042-001  
User: PSH

Agency or organization name: DRMS

### TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
002	Overburden Replacement	SCRAPER1	1	247.17	\$747,969
003	Topsoil Replacement	SCRAPER1	1	33.84	\$102,414
004	Dewatering	SITEMAINT ENANCE	1	0.00	\$10,350
005	Revegetation - 96 Acres	REVEGE	1	120.00	\$429,092
006	Cell C Liner Mobilization	SITEMAINT ENANCE	1	20.00	\$150,000
007	Cell C - Backfill 200-400' Along River	SCRAPER1	1	51.70	\$181,899
008	Cell C - Foundation Excavation	SCRAPER1	1	7.71	\$27,115
009	Cell C - Slope Liner Embankment	SCRAPER1	1	38.54	\$135,577
010	Cell C - Reservoir Grading	DOZERGRADER	1	200.00	\$55,270
<b><u>SUBTOTALS:</u></b>				<b>718.96</b>	<b>\$1,839,686</b>

### INDIRECT COSTS

#### OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$37,162
Performance bond:	1.05	Total =	\$19,317
Job superintendent:	299.48	Total =	\$22,500
Profit:	10.00	Total =	\$183,969
		TOTAL O & P =	\$262,947
		CONTRACT AMOUNT (direct + O & P) =	\$2,102,633

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	\$500	Total =	\$500
Engineering work and/or contract/bid preparation:	4.25	Total =	\$89,362
Reclamation management and/or administration:	5.00		\$105,132

CONTINGENCY: 0.00 Total = \$0

TOTAL INDIRECT COST = \$457,940

**TOTAL BOND AMOUNT (direct + indirect) = \$2,297,626**  
**\$2,300,000 (Rounded)**

**SCRAPER TEAM WORK**Task description: **Overburden Replacement**Site: **Windsor East Mine**Permit Action: 2023 Permit  
ApplicationPermit/Job#: M2022042**PROJECT IDENTIFICATION**Task #: 002State: ColoradoAbbreviation: NoneDate: 3/24/2023County: WeldFilename: M042-002User: PSHAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-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	NA	100	NA	100	100
Ownership cost/hour:	\$264.49	NA	\$124.85	NA	\$114.80	\$14.98
Operating cost/hour:	\$296.10	NA	\$97.63	NA	\$79.39	\$33.32
%Utilization-ripper:	NA	NA	25	NA	NA	NA
Ripper own. cost/hour:	NA	NA	\$13.10	NA	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	\$1.83	NA	\$0.00	\$0.00
Operator cost/hour:	\$47.07	NA	\$40.04	NA	\$46.87	\$28.63
Unit Subtotals:	\$607.66	NA	\$277.44	NA	\$241.06	\$76.93
Number of Units:	4	0	1	0	1	1
Group Subtotals:	Work:	\$2,430.64	Support:	\$277.44	Maint:	\$317.99

Total work team cost/hour: **\$3,026.07****MATERIAL QUANTITIES**Initial volume: 489,000

CCY

Swell factor: 1.000Loose volume: **489,000**

LCY

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

Material weight: 2,650 lbs/LCY  
 Material description: Decomposed rock - 25% Rock,  
75% Earth  
 Rated Payload: 81,600 pounds

Struck Volume: 24.00 LCY  
 Heaped Volume: 34.00 LCY  
 Average Volume: 29.00 LCY

Payload Capacity: 30.79 LCYAdjusted Capacity: 29.00 LCYCycle Time:Scraper Loading Time: 0.80 Minutes  
Maneuver and Spread Time: 0.60 MinutesJob Condition Correction:

Site Altitude: 4729 feet

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

Travel Time:Road Condition: 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	1600.00	0.00	3.00	3.00	2800	0.84

Haul Time: 0.84 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1600.00	0.00	3.00	3.00	2949	0.68

Return Time: 0.68 minutesTotal Scraper team cycle time: 2.92 minutesAdjusted for job conditions: 494.59 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 1,978.36 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 1,978.36 LCY/HourUnadjusted unit production/hour: 595.89 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

JOB TIME AND COSTFleet size: 1 Team(s)Total job time: 247.17 HoursUnit cost: \$1.530 /LCYTotal job cost: \$747,969

**SCRAPER TEAM WORK**Task description: **Topsoil Replacement**Site: **Windsor East Mine**Permit Action: 2023 Permit  
ApplicationPermit/Job#: M2022042**PROJECT IDENTIFICATION**Task #: 003State: ColoradoAbbreviation: NoneDate: 3/24/2023County: WeldFilename: M042-003User: PSHAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-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	NA	100	NA	100	100
Ownership cost/hour:	\$264.49	NA	\$124.85	NA	\$114.80	\$14.98
Operating cost/hour:	\$296.10	NA	\$97.63	NA	\$79.39	\$33.32
%Utilization-ripper:	NA	NA	25	NA	NA	NA
Ripper own. cost/hour:	NA	NA	\$13.10	NA	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	\$1.83	NA	\$0.00	\$0.00
Operator cost/hour:	\$47.07	NA	\$40.04	NA	\$46.87	\$28.63
Unit Subtotals:	\$607.66	NA	\$277.44	NA	\$241.06	\$76.93
Number of Units:	4	0	1	0	1	1
Group Subtotals:	Work: \$2,430.64		Support: \$277.44		Maint: \$241.06	\$317.99

Total work team cost/hour: **\$3,026.07****MATERIAL QUANTITIES**Initial volume: 68,600

CCY

Swell factor: 1.000Loose volume: **68,600**

LCY

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

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

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

Site Altitude: 4729 feet

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

Travel Time:Road Condition: 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	1600.00	0.00	3.00	3.00	2800	0.77

Haul Time: 0.77 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1600.00	0.00	3.00	3.00	2949	0.68

Return Time: 0.68 minutesTotal Scraper team cycle time: 2.85 minutesAdjusted for job conditions: 506.74 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 2,026.95 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 2,026.95 LCY/HourUnadjusted unit production/hour: 610.53 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 33.84 HoursUnit cost: \$1.493 /LCYTotal job cost: \$102,414

## SITE MAINTENANCE

Task description: Dewatering

Site: Windsor East Mine Permit Action: 2023 Permit Application Permit/Job#: M2022042

### PROJECT IDENTIFICATION

Task #: 004 State: Colorado Abbreviation: None  
Date: 3/24/2023 County: Weld Filename: M042-004  
User: PSH

Agency or organization name: DRMS

### UNIT COSTS

Maintenance Item	Hours per Year	Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Dewatering	80.00	Centrifugal pump - 90M, 6 in.	200.00	EA	\$51.75	\$10,350.00

Job Hours: 0.00

Total Cost: \$10,350.00



**REVEGETATION WORK**Task description: **Revegetation - 96 Acres**

Site: **Windsor East Mine** Permit Action: **2023 Permit Application** Permit/Job#: **M2022042**

**PROJECT IDENTIFICATION**

Task #: **005** State: **Colorado** Abbreviation: **None**  
 Date: **3/24/2023** County: **Weld** Filename: **M042-005**  
 User: **PSH**

Agency or organization name: **DRMS****FERTILIZING****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
0-20-20, 4-8-12, 10-10-10	2.00	pound	\$0.23	\$0.46
			<b>Total Fertilizer Materials Cost/Acre</b>	<b>\$0.46</b>

**Application**

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	\$39.64
<b>Total Fertilizer Application Cost/Acre</b>	<b>\$39.64</b>

**TILLING**

Description	Cost /Acre
Disc harrowing, 6" deep (MEANS 32 91 13.23 6100)	\$117.18
Weed control spraying (MEANS 31 31 16.13 3100)	\$290.40
<b>Total Tilling Cost/Acre</b>	<b>\$407.58</b>

**SEEDING**

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alkali Sacaton	0.10	3.90	\$2.85
Switchgrass - Pathfinder	0.67	5.98	\$8.54
Mountain Brome - Bromar	1.74	2.80	\$6.61
Sideoats Grama - Butte	1.80	5.91	\$16.20
Western Wheatgrass - Arriba	1.74	4.39	\$11.31
Sweetvetch, Utah or Northern	1.02	0.46	\$76.50
Needle and Thread	1.29	3.41	\$53.99
Rose, Meadow	0.87	0.74	\$21.75
Prairie Sandreed - Goshen	0.48	3.01	\$4.97

Penstemon, Rocky Mountain	0.46	7.21	\$13.57
Globemallow, Gooseberry Leaf	0.26	2.94	\$25.22
<b>Totals Seed Mix</b>	10.43	40.75	<b>\$241.51</b>

**Application**

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

**MULCHING and MISCELLANEOUS****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$421.36	\$842.72
Herbicide - Tordon 22K @ 1.0 pt/ac	117.00	ACRE	\$13.40	\$1,567.80
<b>Total Mulch Materials Cost/Acre</b>				<b>\$2,410.52</b>

**Application**

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$73.00
Weed spray, truck, aquatic area, annuals [DMG]	\$22.81
Weed spray, truck, aquatic area, nox. [DMG]	\$62.72
Weed spray, truck, non-aquatic area, nox. [DMG]	\$62.72
Weed spray, truck, non-aquatic areas, ann. [DMG]	\$22.81
<b>Total Mulch Application Cost/Acre</b>	<b>\$244.06</b>

**NURSERY STOCK PLANTING**

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

**JOB TIME AND COST**

No. of Acres:	96	Cost /Acre:	\$3,575.77
Estimated Failure Rate:	25%	Cost /Acre*:	\$3,575.77
*Selected Replanting Work Items:	FERTILIZING,TILLING,SEEDING,MU LCHING		
Initial Job Cost:	\$343,273.92		
Reseeding Job Cost:	\$85,818.48		
Total Job Cost:	\$429,092		
Job Hours:	120.00		

## SITE MAINTENANCE

Task description: Cell C Liner Mobilization

Site: Windsor East Mine Permit Action: 2023 Permit Application Permit/Job#: M2022042

### PROJECT IDENTIFICATION

Task #: 006 State: Colorado Abbreviation: None  
Date: 3/24/2023 County: Weld Filename: M042-006  
User: PSH  
Agency or organization name: DRMS

### UNIT COSTS

Maintenance Item	Hours per Year	Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Cell C Liner Mobilization - MMM Provided	20.00	USER PROVIDED ITEM	1.00	1	\$150,000.00	\$150,000.00

Job Hours: 20.00

Total Cost: \$150,000.00

**SCRAPER TEAM WORK**Task description: **Cell C - Backfill 200-400' Along River**Site: **Windsor East Mine**Permit Action: 2023 Permit  
ApplicationPermit/Job#: M2022042**PROJECT IDENTIFICATION**Task #: 007State: ColoradoAbbreviation: NoneDate: 3/24/2023County: WeldFilename: M042-007User: PSHAgency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	CAT 836H
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	NA	100	100	100	100
Ownership cost/hour:	\$264.49	NA	\$124.85	\$241.92	\$114.80	\$14.98
Operating cost/hour:	\$296.10	NA	\$97.63	\$218.66	\$79.39	\$33.32
%Utilization-ripper:	NA	NA	25	NA	NA	NA
Ripper own. cost/hour:	NA	NA	\$13.10	\$0.00	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	\$1.83	\$0.00	\$0.00	\$0.00
Operator cost/hour:	\$47.07	NA	\$40.04	\$31.50	\$46.87	\$28.63
Unit Subtotals:	\$607.66	NA	\$277.44	\$492.08	\$241.06	\$76.93
Number of Units:	4	0	1	1	1	1
Group Subtotals:	Work:	\$2,430.64	Support:	\$769.52	Maint:	\$317.99

Total work team cost/hour: **\$3,518.15****MATERIAL QUANTITIES**Initial volume: 115,000

CCY

Swell factor: 1.000Loose volume: **115,000**

LCY

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

Material weight: 2,900 lbs/LCY  
 Material description: Sand and gravel - Dry  
 Rated Payload: 81,600 pounds  
 Payload Capacity: 28.14 LCY

Struck Volume: 24.00 LCY  
 Heaped Volume: 34.00 LCY  
 Average Volume: 29.00 LCY  
 Adjusted Capacity: **28.14** LCY

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

Site Altitude: 4729 feet

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

Travel Time:Road Condition: 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	1000.00	0.00	3.00	3.00	2800	0.64

Haul Time: 0.64 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	3.00	3.00	2949	0.48

Return Time: 0.48 minutesTotal Scraper team cycle time: 2.52 minutesAdjusted for job conditions: 556.06 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 2,224.24 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 2,224.24 LCY/HourUnadjusted unit production/hour: 669.95 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

JOB TIME AND COSTFleet size: 1 Team(s)Total job time: 51.70 HoursUnit cost: \$1.582 /LCYTotal job cost: \$181,899

**SCRAPER TEAM WORK**Task description: **Cell C - Foundation Excavation**Site: **Windsor East Mine**Permit Action: 2023 Permit  
Application

Permit/Job#: M2022042

**PROJECT IDENTIFICATION**

Task #: 008

State: Colorado

Abbreviation: None

Date: 3/24/2023

County: Weld

Filename: M042-008

User: PSH

Agency or organization name: DRMS

**HOURLY EQUIPMENT**

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	CAT 836H
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	NA	100	100	100	100
Ownership cost/hour:	\$264.49	NA	\$124.85	\$241.92	\$114.80	\$14.98
Operating cost/hour:	\$296.10	NA	\$97.63	\$218.66	\$79.39	\$33.32
%Utilization-ripper:	NA	NA	25	NA	NA	NA
Ripper own. cost/hour:	NA	NA	\$13.10	\$0.00	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	\$1.83	\$0.00	\$0.00	\$0.00
Operator cost/hour:	\$47.07	NA	\$40.04	\$31.50	\$46.87	\$28.63
Unit Subtotals:	\$607.66	NA	\$277.44	\$492.08	\$241.06	\$76.93
Number of Units:	4	0	1	1	1	1
Group Subtotals:	Work: \$2,430.64		Support: \$769.52		Maint: \$317.99	

Total work team cost/hour: **\$3,518.15****MATERIAL QUANTITIES**

Initial volume: 18,000

CCY

Swell factor: 1.000

Loose volume: **18,000**

LCY

Source of estimated volume: Division of Reclamation, Mining &amp; Safety

Source of estimated swell factor: Cat Handbook

**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight: 2,900 lbs/LCY  
 Material description: Sand and gravel - Dry  
 Rated Payload: 81,600 pounds  
 Payload Capacity: 28.14 LCY

Struck Volume: 24.00 LCY  
 Heaped Volume: 34.00 LCY  
 Average Volume: 29.00 LCY  
 Adjusted Capacity: **28.14** LCY

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

Site Altitude: 4729 feet

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

Travel Time:Road Condition: Very hard, smooth, asphalt or concrete, no tire penetration 1.2Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	1.20	1.20	2952	0.55

Haul Time: 0.55 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	1.20	1.20	2963	0.45

Return Time: 0.45 minutesTotal Scraper team cycle time: 2.40 minutesAdjusted for job conditions: 583.86 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 2,335.45 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 2,335.45 LCY/HourUnadjusted unit production/hour: 703.45 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 7.71 HoursUnit cost: \$1.506 /LCYTotal job cost: \$27,115

**SCRAPER TEAM WORK**Task description: **Cell C - Slope Liner Embankment**Site: **Windsor East Mine**Permit Action: 2023 Permit  
Application

Permit/Job#: M2022042

**PROJECT IDENTIFICATION**

Task #: 009

State: Colorado

Abbreviation: None

Date: 3/24/2023

County: Weld

Filename: M042-009

User: PSH

Agency or organization name: DRMS

**HOURLY EQUIPMENT**

COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 637G
-Dozer:	NA
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	CAT 836H
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	NA	100	100	100	100
Ownership cost/hour:	\$264.49	NA	\$124.85	\$241.92	\$114.80	\$14.98
Operating cost/hour:	\$296.10	NA	\$97.63	\$218.66	\$79.39	\$33.32
%Utilization-ripper:	NA	NA	25	NA	NA	NA
Ripper own. cost/hour:	NA	NA	\$13.10	\$0.00	\$0.00	\$0.00
Ripper op. cost/hour:	NA	NA	\$1.83	\$0.00	\$0.00	\$0.00
Operator cost/hour:	\$47.07	NA	\$40.04	\$31.50	\$46.87	\$28.63
Unit Subtotals:	\$607.66	NA	\$277.44	\$492.08	\$241.06	\$76.93
Number of Units:	4	0	1	1	1	1
Group Subtotals:	Work:	\$2,430.64	Support:	\$769.52	Maint:	\$317.99

Total work team cost/hour: **\$3,518.15****MATERIAL QUANTITIES**

Initial volume: 90,000

CCY

Swell factor: 1.000

Loose volume: 90,000

LCY

Source of estimated volume: Division of Reclamation, Mining &amp; Safety

Source of estimated swell factor: Cat Handbook

**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight: 2,900 lbs/LCY  
 Material description: Sand and gravel - Dry  
 Rated Payload: 81,600 pounds  
 Payload Capacity: 28.14 LCY

Struck Volume: 24.00 LCY  
 Heaped Volume: 34.00 LCY  
 Average Volume: 29.00 LCY  
 Adjusted Capacity: 28.14 LCY



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

Site Altitude: 4729 feet

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

Travel Time:Road Condition: Very hard, smooth, asphalt or concrete, no tire penetration 1.2Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	1.20	1.20	2952	0.55

Haul Time: 0.55 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	1.20	1.20	2963	0.45

Return Time: 0.45 minutesTotal Scraper team cycle time: 2.40 minutesAdjusted for job conditions: 583.86 LCY/HourSelected Number of Scrapers: 4 Scraper(s)Adjusted single scraper team (unit) hourly production: 2,335.45 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 2,335.45 LCY/HourUnadjusted unit production/hour: 703.45 LCY/Hour

Optimal Number of Scrapers per push dozer: \_\_\_\_\_

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 38.54 HoursUnit cost: \$1.506 /LCYTotal job cost: \$135,577

DOZERGRADER WORKTask description: Cell C - Reservoir Grading

Site: Windsor East Mine Permit Action: 2023 Permit Application Permit/Job#: M2022042

PROJECT IDENTIFICATION

Task #: 010 State: Colorado Abbreviation: None  
 Date: 3/24/2023 County: Weld Filename: M042-010  
 User: PSH

Agency or organization name: DRMSHOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU  
 Horsepower: \_\_\_\_\_  
 Blade Type: \_\_\_\_\_  
 Attachment: 3-shank ripper  
 Shift Basis: 1 per day  
 Data Source: \_\_\_\_\_

Cost Breakdown:

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$124.85</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$97.63</u>	<u>100</u>
Ripper own. Cost/Hour:	<u>\$13.10</u>	<u>NA</u>
Ripper op. Cost/Hour:	<u>\$0.73</u>	<u>10</u>
Operator Cost/Hour:	<u>\$40.04</u>	<u>NA</u>
Total unit Cost/Hour:	<u>\$276.35</u>	
Total Fleet Cost/Hour:	<u>\$276.35</u>	

JOB TIME AND COST

Fleet size: 1 Dozer(s)  
 Unit cost: \$276.35/LCY

Total job time: 200.00 Hours  
 Total job cost: \$55,270