

STATE OF
COLORADO

Zuber - DNR, Rob <rob.zuber@state.co.us>

Fourth adequacy letter for Bernhardt with cost estimate

1 message

Zuber - DNR, Rob <rob.zuber@state.co.us>

Thu, Jun 20, 2024 at 11:31 AM

To: JC York <jcyork@j-tconsulting.com>, Andy Carpenter <acarpenter@wwclyde.net>

Cc: Amy Eschberger - DNR <amy.eschberger@state.co.us>

Hello, Andy and J.C. -

Please see the enclosed adequacy letter with two additional adequacy items. One is based on your correspondence with Mike Janeczko, and one is based on DRMS efforts related to the cost estimate (RCE).

Enclosed with this letter is our RCE. J.C., since you and I talked this morning, I did add engineering costs to the indirect costs; this is now a DRMS policy.

For the slurry wall cost, I am using a unit cost of \$6.50 per linear foot.

If you guys decide to extend the decision date for this application, Amy Eschberger and I think that a date of July 12th would be appropriate for the schedule related to a pre-hearing conference and Board hearing.

Thank you very much for your attention to these items.

Rob

Rob Zuber, P.E.
Environmental Protection Specialist
Active Mines Regulatory Program



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

I am working remotely and can be reached by cell at 720.601.2276.

Physical Address:

1313 Sherman Street, Room 215
Denver, CO 80203

Mailing Address:

Division of Reclamation, Mining and Safety, Room 215
1001 East 62nd Avenue
Denver, CO 80216

rob.zuber@state.co.us | <http://drms.colorado.gov>



M2023025_DRMS Fourth Adequacy Review with Divisions RCE.pdf
495K



June 20, 2024

Andy Carpenter
WW Clyde & Company
10303 East Dry Creek Road, #300
Englewood, CO 80112

**Re: Bernhardt Sand and Gravel Pit, File No. M-2023-025,
112c Permit Application, Fourth Adequacy Review with cost estimate**

Mr. Carpenter:

The Division of Reclamation, Mining and Safety (Division/DRMS) reviewed the contents of the 112c permit application for the Bernhardt Sand and Gravel Pit, File No. M-2023-025, and your responses (letters dated April 8, May 21, and June 11, 2024) to our adequacy reviews.

You have addressed all the issues in our previous adequacy letters, but we have two additional adequacy items.

- 1. Please update the Wildlife Exhibit (Exhibit H). In the last paragraph of this exhibit, you commit to an additional raptor survey. However, you should add additional language stating that, based on the results of this survey, you will coordinate with the Division and Colorado Parks and Wildlife and update the Mining Plan, as appropriate, to limit wildlife impacts.**
- 2. The second item is related to the Division's Reclamation Cost Estimate (RCE). Please add the cost of constructing the riprap rundown to Exhibit L. Also include a discussion of how this cost item was developed, including the volume of rock and source.**

I am including for your review the RCE that the Division has created with our cost estimating software. Please call or email me with comments and/or questions related to this.

Please be advised that this application for the Bernhardt Sand and Gravel Pit may be deemed inadequate, and the application may be denied 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. Also, please allow the Division time to perform another review of your additional responses. This request for an extension must be received no later than the decision date of June 30, 2024.



If you have any questions, please contact me at rob.zuber@state.co.us or (720) 601-2276.

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert D. Zuber".

Robert D. Zuber, P.E.

Environmental Protection Specialist

Enclosure

Copied via e-mail: Amy Eschberger, DRMS
J.C. York, P.E., J&T Consulting, Inc.

COST SUMMARY WORK

Task description: Cost Summary

Site: Bernhardt Sand and Gravel Pit

Permit Action: Initial RCE

Permit/Job#: M2023025

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 6/12/2024 County: Weld Filename: M025-000
User: RDZ

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
01a	Dewatering of pit	PUMPING	1	746.53	\$92,742
02a	Haul material for banks of reservoir	TRUCK1	1	407.74	\$571,899
02b	Grade banks of reservoir	DOZER	2	127.63	\$108,570
02c	Compact banks of reservoir	COMPACT	2	90.56	\$53,661
02d	Construct riprap rundown near SW corner of pit	POSTMINING	1	725.89	\$298,061
03a	Construct slurry wall and groundwater drain	NA	1	400.00	\$1,807,000
03b	Construct groundwater drain	NA	1	40.00	\$77,800
04a	Haul topsoil	TRUCK1	1	32.22	\$45,192
04b	Grade topsoil	DOZER	2	3.59	\$3,053
05a	Reseeding of upper banks of reservoir and corners of site	REVEGE	1	7.50	\$35,667
06a	Demo for scale house, scale (use remains for riprap channel)	DEMOLISH	1	20.00	\$1,462
07a	Mob./Demob. Equipment	MOBILIZE	1	1.50	\$4,359
<u>SUBTOTALS:</u>				2603.16	\$3,099,466

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	\$62,609
Performance bond:	1.05	Total =	\$32,544
Job superintendent:	707.88	Total =	\$46,069
Profit:	10.00	Total =	\$309,947
		TOTAL O & P =	\$451,169
		CONTRACT AMOUNT (direct + O & P) =	\$3,550,635

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	\$500	Total =	\$500
Engineering work and/or contract/bid preparation:	4.25	Total =	\$150,902
Reclamation management and/or administration:	5.00		\$177,532

CONTINGENCY: 0.00 Total = \$0

TOTAL INDIRECT COST = \$780,103

TOTAL BOND AMOUNT (direct + indirect) = \$3,879,569

PUMPING WORK

Task description: Dewatering of pit

Site: Bernhardt Sand and Gravel Pit

Permit Action:

Initial RCE

Permit/Job#: M2023025

PROJECT IDENTIFICATION

Task #: 01A

State: Colorado

Abbreviation: None

Date: 6/12/2024

County: Weld

Filename: M025-01a

User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

	Description	Quantity
Make and Model:	Submersible pump - 460v, 8 in.	5
Attachment 1:	Suction hose - 6 in. diam., 25 ft.	5
Attachment 2:	Discharge hose - 6 in. D., 25 ft.	5
Labor Unit 1:	Pump operator	1
Horsepower:	95	
Shift Basis:	1 per day	
Weight:	0.70	
	(US Tons)	

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	\$76.40	NA
Operating Cost/Hour:	\$19.60	100
Operator Cost/Hour:	\$28.23	NA
Total Unit Cost/Hour:	\$124.23	
Total Fleet Cost/Hour:	\$124.23	

PUMPING QUANTITIES

Initial Pond Volume:	684,000,000.00		Conversion factor:	1.0000
Final Pond Volume:	684,000,000.00	gallons		
Total Pond Inflow Surface Area:	1,000	Sq. ft.	Unit inflow rate in gph/sq. ft.:	0.0879
Total Pond Inflow Volume per Hour:	87.90	gallons		

Source of estimated volume: Exhibit L

PUMPING TIME

Maximum Pump Capacity:	170,000	gph/pump
Estimated Suction Head:	0	feet
Estimated Discharge Head:	0	feet
Total Head:	0	feet
CPB Pump Capacity:	168,000	gph/pump
Site Altitude:	4,725	feet
Adjusted Pumping Capacity:	840,000	gph
Initial Unadjusted Pumping Time:	814.29	hours
Inflow during Initial Pumping:	71,576	gallons
Net Unadjusted Pumping Time:	814.37	Hours
Altitude Adjustment Factor:	1.0000	(3% rule)
Pump Efficiency Factor:	0.9167	(55 min./hr.)
Total Adjusted Pumping Time:	746.53	hours

JOB TIME AND COST

Total job time: 746.53 Hours

Unit cost: \$0.000136 /Gallon

Total job cost: \$92,742

TRUCK/LOADER TEAM WORKTask description: Haul material for banks of reservoirSite: Bernhardt Sand and Gravel
PitPermit Action: Initial RCEPermit/Job#: M2023025PROJECT IDENTIFICATION

Task #: 02A State: Colorado Abbreviation: None
 Date: 6/12/2024 County: Weld Filename: M025-02a
 User: RDZ

Agency or organization name: DRMSHOURLY EQUIPMENT COSTShift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	CAT 966H high lift
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	Cat D8T - 8SU
Road Maintenance -Motor Grader:	NA
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

	Truck/Loader Team		Support Equipment		Maintenance Equipment	
	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	100	100	NA	100
Ownership cost/hour:	\$26.39	\$65.69	\$241.38	\$241.38	NA	\$16.65
Operating cost/hour:	\$64.76	\$48.09	\$143.92	\$143.92	NA	\$37.60
%Utilization-ripper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	\$0.00
Ripper op. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	\$0.00
Operator cost/hour:	\$24.82	\$35.97	\$40.04	\$40.04	NA	\$0.00
Unit Subtotals:	\$115.97	\$149.75	\$425.34	\$425.34	NA	\$54.25
Number of Units:	3	1	1	1	0	1
Group Subtotals:	Work: \$497.66		Support: \$850.68		Maint: \$54.25	

Total work team cost/hour: \$1,402.59MATERIAL QUANTITIES

Initial volume: 175,000 CCY Swell factor: 1.115
 Loose volume: 195,125 LCY

Source of estimated volume: Exhibit L for total for bank and assume half to be hauled.
 Source of estimated swell factor: Cat Handbook
 Material Purchase Cost: \$0.00
 Total Cost: \$0.00

HOURLY PRODUCTIONTruck Capacity:

Truck Payload (weight) Basis:

Material weight: 2,100 Pounds/LCY
 Description: Earth - Loam
 Rated Payload: 50,300 Pounds

Payload Capacity: 23.95 LCY**Truck Bed (volume) Basis:**

Struck Volume: 12.00 LCY
 Heaped Volume: 18.00 LCY
 Average Volume: 15.00 LCY
 Adjusted Volume: 18.00 LCY

Final Truck Volume Based on Number of Loader Passes: 15.38 LCY**Loading Tool Capacity**Bucket Size Class: NA

Rated Capacity: 5.000 LCY (heaped)
 Bucket Fill Factor: 1.025 Rock - Earth Mixture (100%-105%) 1.025
 Adjusted Capacity: 5.125 LCY

Job Condition Corrections:Site Altitude (ft.): 4725 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: 3 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: 0.100Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Operation:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Dump Target:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Net Cycle Time Adjustment:		0.000	minutes
Adjusted Loader Cycle Time:		0.500	minutes
Net Load Time per Truck:		1.100	minutes

Truck Cycle Time:

Truck Exchange Time: 0.50 Minutes Adjusted for site altitude: 0.500 Minutes
 Truck Load Time: 1.100 Minutes Adjusted for site altitude: 1.100 Minutes
 Truck Maneuver and Dump Time: 0.90 Minutes Adjusted for site altitude: 0.900 Minutes

Truck Travel (Haul & Return) Time:
maintained 3.0Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered,

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	3.00	3.00	2824	0.515

Haul Time: **0.515** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1000.00	0.00	3.00	3.00	2874	0.383

Return Time: **0.383** minutesTotal Truck Cycle Time: **3.398** minutes

Loading Tool unit
 Production 576.56 LCY/Hour Adjusted for job efficiency: 478.55 LCY/Hour
 Truck Unit Production
271.48 LCY/Hour Adjusted for job efficiency: 225.33 LCY/Hour
 Optimal No. of Trucks: 2 Truck(s) Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 675.99 LCY/Hour
 Adjusted single truck/loader team production: 478.55 LCY/Hour
 Adjusted multiple truck/loader team production: **478.55** LCY/Hour

JOB TIME AND COSTFleet size: 1 Team(s) Total job time: **407.74** HoursUnit cost: \$2.931 /LCY Total job cost: **\$571,899**

BULLDOZER WORKTask description: Grade banks of reservoirSite: Bernhardt Sand and Gravel
PitPermit Action: _____
Initial RCE _____Permit/Job#: M2023025**PROJECT IDENTIFICATION**Task #: 02B
Date: 6/12/2024
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M025-02bAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: NA
Shift Basis: 1 per day
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$241.38</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$143.92</u>	<u>100</u>
Ripper own. Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Ripper op. Cost/Hour:	<u>\$0.00</u>	<u>0</u>
Operator Cost/Hour:	<u>\$40.04</u>	<u>NA</u>
Total unit Cost/Hour:	<u>\$425.34</u>	
Total Fleet Cost/Hour:	<u>\$850.67</u>	

MATERIAL QUANTITIESInitial Volume: 352,000
Swell factor: 1.000
Loose volume: 352,000 LCYSource of estimated volume: Division of Reclamation, Mining & Safety
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feet
Unadjusted hourly production: 1,400.0 LCY/hrMaterials consistency description: Loose stockpile 1.2Average push gradient: -5 %
Average site altitude: 4,725 feetMaterial weight: 2,100 lbs/LCYWeight description: Earth - Loam**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	<u>0.750</u>	<u>(AVG.)</u>
Material consistency:	<u>1.200</u>	<u>(CAT HB)</u>
Dozing method:	<u>1.200</u>	<u>(S-BY-S)</u>

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.900	(SSD-FC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.095	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.9850

Adjusted unit production: 1,379.00 LCY/hr

Adjusted fleet production: **2758 LCY/hr**

JOB TIME AND COST

Fleet size: 2 Dozer(s)
 Unit cost: \$0.308/LCY

Total job time: **127.63 Hours**
 Total job cost: **\$108,570**

COMPACTION WORK

Task description: Compact banks of reservoir

Site: Bernhardt Sand and Gravel Pit Permit Action: Initial RCE Permit/Job#: M2023025

PROJECT IDENTIFICATION

Task #: 02C State: Colorado Abbreviation: None
Date: 6/12/2024 County: Weld Filename: M025-02c
User: RDZ

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 815F Horsepower: 240
Compactor Type: Soil - tamping foot Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

Ownership Cost/Hour:	<u>\$147.57</u>	Utilization %	<u>NA</u>
Operating Cost/Hour:	<u>\$117.19</u>		<u>100</u>
Operator Cost/Hour:	<u>\$31.50</u>		<u>NA</u>
Total Unit Cost/Hour:	<u>\$296.26</u>		
Total Fleet Cost/Hour:	<u>\$592.53</u>		

MATERIAL QUANTITIES

Loose volume: 352,000 LCY Shrinkage factor: 0.905
Compacted volume: 318,560 CCY
Source of estimated volume: Exhibit L
Source of estimated shrinkage factor: Cat Handbook

HOURLY PRODUCTION

Unadjusted hourly production = $(W \times S \times L \times C) / P$

Compacted width per pass (W): 6.50 feet
Average Compactor Speed (S): 8.00 mph
Compacted thickness of each lift (L): 10.00 inches
Conversion Constant (C): 16.3 (5,280ft./12in./27cu.ft.)
Required number of machine passes (P): 4 passes
Unadjusted Hourly Unit Production: 2,119.00 CCY/hour

Job Condition Correction Factors

Site Altitude: 4,725 feet

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

Adjusted Hourly Unit Production: 1,758.77 CCY/Hour
Adjusted Hourly Fleet Production: 3,517.54 CCY/Hour

JOB TIME AND COST

Fleet size: 2 Compactor(s) Total job time: 90.56 Hours
Unit cost: \$0.168 per CCY Total job cost: \$53,661

Post-Mining Drainage Channel Construction (Ditches)

Task description: Construct riprap rundown near SW corner of pit

Site: Bernhardt Sand and Gravel
Pit

Permit Action: Initial RCE

Permit/Job#: M2023025

PROJECT IDENTIFICATION

Task #: 02D
Date: 6/13/2024
User: RDZ

State: Colorado
County: Weld

Abbreviation: None
Filename: M025-02d

Agency or organization name: DRMS

Channel	Length (ft)	Depth (ft)	Width (bottom) (ft)	Side Slopes (XH:1V)	Width (top) (ft)	Excavated Vol./LF (CY)	Excavated Vol. (total) (CY)
Rundown	250	5.00	100.00	10.00	200.00	27.7778	6,944
Totals:	250						6,944

Riprap	Riprap Thickness (2xD50) (ft)	Perimeter, P (ft)	Area for Geotextile (excl. anchor trenches) (sf)	Riprap Vol. (CY)
	2.00	200.50	50,125	3,713
Totals:			50,125	3,713

Materials Needed:

Geotextile (SY incl. 15% wastage): 6,405
Riprap (CY): 3,713
Excavation (CY): 6,944

Costs:

Material Costs:	Geotextile (SY):	<u>\$3.30</u>	Riprap (CY):	<u>\$34.50</u>	Excavation (CY):	<u>\$0.00</u>
Labor Cost:		<u>\$0.32</u>		<u>\$14.65</u>		<u>\$2.84</u>
Equipment Cost:		<u>\$0.00</u>		<u>\$15.10</u>		<u>\$2.39</u>
Means Reference	31 32 1916 1510		31 37 1310 0100		31 23 1642 0310	

Totals:

Geotextile (SY): \$23,185.45
Riprap (CY): \$238,556.39
Excavation (CY): \$36,319.44

Hours:

Geotextile (SY): 73.20
87.50 SY/HR
Riprap (CY): 479.09
7.75 CY/HR
Excavation (CY): 173.61
40.00 CY/HR

Total Post-Mining Channel Reconstruction hours: 725.90 Hours

Total Post-Mining Channel Reconstruction Cost:	<u>\$298,061</u>
--	-------------------------

TRUCK/LOADER TEAM WORKTask description: Haul topsoilSite: Bernhardt Sand and Gravel
PitPermit Action: Initial RCEPermit/Job#: M2023025PROJECT IDENTIFICATION

Task #: 04A State: Colorado Abbreviation: None
 Date: 6/12/2024 County: Weld Filename: M025-04a
 User: RDZ

Agency or organization name: DRMSHOURLY EQUIPMENT COSTShift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 12-18 cy, 6x4
-Loader:	CAT 966H high lift
Support Equipment -Load Area:	Cat D8T - 8SU
-Dump Area:	Cat D8T - 8SU
Road Maintenance -Motor Grader:	NA
-Water Truck:	Water Tanker, 3,500 Gal.

Cost Breakdown:

Truck/Loader Team

Support Equipment

Maintenance Equipment

	Truck	Loader	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	100	100	100	NA	100
Ownership cost/hour:	\$26.39	\$65.69	\$241.38	\$241.38	NA	\$16.65
Operating cost/hour:	\$64.76	\$48.09	\$143.92	\$143.92	NA	\$37.60
%Utilization-riper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	\$0.00
Ripper op. cost/hour:	NA	\$0.00	\$0.00	\$0.00	NA	\$0.00
Operator cost/hour:	\$24.82	\$35.97	\$40.04	\$40.04	NA	\$0.00
Unit Subtotals:	\$115.97	\$149.75	\$425.34	\$425.34	NA	\$54.25
Number of Units:	3	1	1	1	0	1
Group Subtotals:	Work: \$497.66		Support: \$850.68		Maint: \$54.25	

Total work team cost/hour: \$1,402.59MATERIAL QUANTITIES

Initial volume: 13,000 CCY Swell factor: 1.215
 Loose volume: 15,795 LCY

Source of estimated volume: Exhibit D
 Source of estimated swell factor: Cat Handbook
 Material Purchase Cost: \$0.00
 Total Cost: \$0.00

HOURLY PRODUCTIONTruck Capacity:Truck Payload (weight) Basis:

Material weight: 1,600 Pounds/LCY
 Description: Top Soil
 Rated Payload: 50,300 Pounds

Payload Capacity: 31.44 LCY**Truck Bed (volume) Basis:**

Struck Volume: 12.00 LCY
 Heaped Volume: 18.00 LCY
 Average Volume: 15.00 LCY
 Adjusted Volume: 18.00 LCY

Final Truck Volume Based on Number of Loader Passes: 15.75 LCY**Loading Tool Capacity**Bucket Size Class: NA

Rated Capacity: 5.000 LCY (heaped)
 Bucket Fill Factor: 1.050 Moist loam or sandy clay (100% - 110%) 1.050
 Adjusted Capacity: 5.250 LCY

Job Condition Corrections:Site Altitude (ft.): 4725 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: 3 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: 0.100Wheel and Track Loaders - Unadjusted Basic Loader Cycle Time (load, dump, maneuver): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Operation:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Dump Target:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Net Cycle Time Adjustment:		0.000	minutes
Adjusted Loader Cycle Time:		0.500	minutes
Net Load Time per Truck:		1.100	minutes

Truck Cycle Time:

Truck Exchange Time: 0.50 Minutes Adjusted for site altitude: 0.500 Minutes
 Truck Load Time: 1.100 Minutes Adjusted for site altitude: 1.100 Minutes
 Truck Maneuver and Dump Time: 0.90 Minutes Adjusted for site altitude: 0.900 Minutes

Truck Travel (Haul & Return) Time:
maintained 3.0Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered,

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	0.00	3.00	3.00	2824	0.870

Haul Time: **0.870** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	0.00	3.00	3.00	2874	0.731

Return Time: **0.731** minutesTotal Truck Cycle Time: **4.101** minutes

Loading Tool unit
 Production 590.63 LCY/Hour Adjusted for job efficiency: 490.22 LCY/Hour
 Truck Unit Production
230.43 LCY/Hour Adjusted for job efficiency: 191.26 LCY/Hour
 Optimal No. of Trucks: 3 Truck(s) Selected Number of Trucks: 3 Truck(s)

Adjusted hourly truck team production: 573.77 LCY/Hour
 Adjusted single truck/loader team production: 490.22 LCY/Hour
 Adjusted multiple truck/loader team production: **490.22** LCY/Hour

JOB TIME AND COSTFleet size: 1 Team(s) Total job time: **32.22** HoursUnit cost: \$2.861 /LCY Total job cost: **\$45,192**

BULLDOZER WORKTask description: Grade topsoilSite: Bernhardt Sand and Gravel
Pit

Permit Action:

Initial RCEPermit/Job#: M2023025**PROJECT IDENTIFICATION**Task #: 04BState: ColoradoAbbreviation: NoneDate: 6/12/2024County: WeldFilename: M025-04bUser: RDZAgency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8SUHorsepower: 310Blade Type: Semi-UniversalAttachment: NAShift Basis: 1 per dayData Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$241.38</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$143.92</u>	<u>100</u>
Ripper own. Cost/Hour:	<u>\$0.00</u>	<u>NA</u>
Ripper op. Cost/Hour:	<u>\$0.00</u>	<u>0</u>
Operator Cost/Hour:	<u>\$40.04</u>	<u>NA</u>

Total unit Cost/Hour: \$425.34Total Fleet Cost/Hour: \$850.67**MATERIAL QUANTITIES**Initial Volume: 13,000Swell factor: 1.000Loose volume: 13,000 LCYSource of estimated volume: Exhibit DSource of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feetUnadjusted hourly production: 1,400.0 LCY/hrMaterials consistency description: Loose stockpile 1.2Average push gradient: -5 %Average site altitude: 4,725 feetMaterial weight: 1,600 lbs/LCYWeight description: Top Soil**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	<u>0.750</u>	<u>(AVG.)</u>
Material consistency:	<u>1.200</u>	<u>(CAT HB)</u>
Dozing method:	<u>1.200</u>	<u>(S-BY-S)</u>

Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.900	(SSD-FC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	1.438	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 1.2935

Adjusted unit production: 1,810.90 LCY/hr

Adjusted fleet production: **3621.8 LCY/hr**

JOB TIME AND COST

Fleet size: 2 Dozer(s)

Unit cost: \$0.235/LCY

Total job time: **3.59 Hours**

Total job cost: **\$3,053**

REVEGETATION WORKTask description: Reseeding of upper banks of reservoir and corners of siteSite: Bernhardt Sand and Gravel
PitPermit Action: Initial RCEPermit/Job#: M2023025**PROJECT IDENTIFICATION**Task #: 05A
Date: 6/12/2024
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M025-05aAgency or organization name: DRMS**FERTILIZING****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
10-34-0, 18-46-0, 5-10-5	200.00	pound	\$0.50	\$99.34
			Total Fertilizer Materials Cost/Acre	\$99.34

Application

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	\$41.82
Total Fertilizer Application Cost/Acre	\$41.82

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	\$100.40
Weed control spraying (MEANS 31 31 16.13 3100)	\$338.80
Total Tilling Cost/Acre	\$439.20

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Alkali Sacaton	0.01	0.39	\$0.28
Switchgrass - Blackwell	0.90	8.04	\$10.35
Blue Grama - Lovington	0.20	3.26	\$3.20
Indian Ricegrass - Native	1.90	6.15	\$12.35
Sand Dropseed	0.01	1.19	\$0.10
Kentucky Bluegrass - Ginger	0.05	2.47	\$0.16
Little Bluestem - Pastura	0.70	4.18	\$9.44
Sideoats Grama - Vaughn	1.80	5.91	\$15.08
Strawberry Clover (coated)	0.10	0.68	\$0.63

Smooth Brome - Manchac	0.10	0.33	\$0.33
Sheep Fescue - Covar	0.40	6.24	\$2.44
Tall Wheatgrass - Jose	1.10	1.99	\$3.71
Totals Seed Mix	7.27	40.84	\$58.06

Application

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

MULCHING and MISCELLANEOUS**Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost / Acre
Herbicide - Curtail @ 4.0 pt/ac	1.00	ACRE	\$35.09	\$35.09
Straw, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$429.79	\$859.57
Total Mulch Materials Cost/Acre				\$894.66

Application

Description	Cost / Acre
Crimping, with tractor {DMG survey data}	\$74.46
Weed spray, truck, non-aquatic area, nox. [DMG]	\$62.72
Total Mulch Application Cost/Acre	\$137.18

NURSERY STOCK PLANTING

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

JOB TIME AND COST

No. of Acres: 15 Cost /Acre: \$1,902.26
 Estimated Failure Rate: 25% Cost /Acre*: \$1,902.26
 *Selected Replanting Work Items: FERTILIZING,TILLING,SEEDING,MULCHING

Initial Job Cost: \$28,533.90
 Reseeding Job Cost: \$7,133.48
 Total Job Cost: \$35,667
 Job Hours: 7.50

DEMOLITION WORK

Task description: Demo for scale house, scale (use remains for riprap channel)

Site: Bernhardt Sand and Gravel
Pit

Permit Action: Initial RCE

Permit/Job#: M2023025

PROJECT IDENTIFICATION

Task #: 06A

State: Colorado

Abbreviation: None

Date: 6/12/2024

County: Weld

Filename: M025-06a

User: RDZ

Agency or organization name: DRMS

UNIT COSTS

Location adjustment: 89.20 %

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Six blocks under scale house	6 X 2'x2'x1.5'	Footing, concrete, average reinforcing - 1.5 ft. x 2 ft.	12.00	LF	\$7.19	\$86.27
Six blocks under scale	6 X 12'x3'x3'	Footing, concrete, average reinforcing - 2.0 ft. x 3 ft.	108.00	LF	\$14.38	\$1,552.88

Job Hours: 20.00

Subtotal
(unadjusted): \$1,639.15

Total Cost
(adjusted for location): \$1,462.12

EQUIPMENT MOBILIZATION/DEMOBILIZATIONTask description: **Mob./Demob. Equipment**Site: **Bernhardt Sand and Gravel**
Pit

Permit Action:

Initial RCEPermit/Job#: M2023025**PROJECT IDENTIFICATION**Task #: 07A
Date: 6/13/2024
User: RDZState: Colorado
County: WeldAbbreviation: None
Filename: M025-07aAgency or organization name: DRMS**EQUIPMENT TRANSPORT RIG COST**Shift basis: 1 per day
Cost 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:	\$20.26	\$36.04	\$47.05
Operating Cost/Hour:	\$39.51	\$76.08	\$82.85
Operator Cost/Hour:	\$22.52	\$22.52	\$22.52
Helper Cost/Hour:	\$0.00	\$23.53	\$23.53
Total Unit Cost/Hour:	\$82.29	\$158.17	\$175.95

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 D8T - 8SU	52.21	\$258.78	\$175.95	2	\$869.46	\$351.90	\$500.00
CAT 966H high lift	25.80	\$65.69	\$82.29	1	\$147.98	\$82.29	\$250.00
CAT 815F	22.88	\$147.57	\$82.29	2	\$459.72	\$164.58	\$500.00

Subtotals: **\$1,477.16** **\$598.77** **\$1,250.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Generic 12-18 cy, 6x4	\$115.97	3	\$347.91	\$347.91
Water Tanker, 3,500 Gal.	\$54.25	1	\$54.25	\$54.25

Subtotals: **\$402.16** **\$402.16**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	<u>GREELEY</u>	
Total one-way travel distance:	<u>15.00</u>	miles
Average Travel Speed:	<u>40.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$4,056.95</u>
** two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$301.62</u>
** one round trip, no haul rig:	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	<u>0.38</u>	<u>0.38</u>
Return Time (Hours):	<u>0.38</u>	<u>0.38</u>
Loading Time (Hours):	<u>0.00</u>	<u>NA</u>
Unloading Time (Hours):	<u>0.00</u>	<u>NA</u>
Subtotals:	<u>0.75</u>	<u>0.75</u>

JOB TIME AND COST

Total job time:	<u>1.50</u>	Hours
-----------------	-------------	-------

Total job cost:	<u>\$4,359</u>
-----------------	----------------