COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, Colorado 80203

December 19, 2018

Daniel Robinson
Robinson Sons Inc.
1228 East 7th Street
Trinidad, CO 81082

Re: Robinson Sons Gravel Pit No. 1, Permit No. M-2008-076
Amendment Application (Revision No. AM-01), Adequacy Review No. 3

Mr. Robinson:

The Division of Reclamation, Mining and Safety (Division) has completed its adequacy review of your response submitted on December 17, 2018. The Division has revised its reclamation bond estimate (see enclosed) for the proposed operation based on the availability of fill material at the creek disturbance areas to backfill the pits and grade any steep slopes to 3H:1V. Please review the enclosed estimate and submit any comments at your earliest convenience.

If the Division receives no comments from you by the application decision date of **December 24, 2018**, the application will be approved with the required financial warranty set at the amount provided in the estimate, $173,730.00. This amount will be an increase of $120,915.00 from the currently held bond of $52,815.00, and will be due within 60 days of the amendment approval date.

If you have any questions, you may call me at (303) 866-3567, ext. 8129, or email me at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger

Amy Eschberger
Environmental Protection Specialist

Encl: Division's revised bond estimate

Ec: Ben Langenfeld, Greg Lewicki and Associates at: benl@lewicki.biz

COST SUMMARY WORK

Task description: **Cost Summary**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-000
User: AME

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Backfill 1,000 ft vertical highwall to 3H:1V in Area 1	LOADER	1	102.14	$9,999.00
002	Rip stockpiling/processing areas in Area 1	RIPPER	1	16.27	$3,665.00
003	Retopsoil 17.14 ac at 8 in depth in Area 1	SCRAPER1	1	35.36	$27,421.00
004	Revegetate 17.14 ac in Area 1	REVEGE	1	34.00	$28,377.00
005	Grade 2.12 ac in Area 2	DOZER	1	9.48	$2,099.00
006	Retopsoil 2.12 ac at 8 in depth in Area 2	SCRAPER1	1	6.89	$5,340.00
007	Revegetate 2.12 ac in Area 2	REVEGE	1	4.00	$3,510.00
008	Demolition of scale and scale house	DEMOLISH	1	10.00	$3,192.98
009	Backfill creek pits and grade slopes to 3H:1V	DOZER	1	29.37	$6,499.00
010	Haul topsoil to creek areas, spread at 8 in depth	TRUCK1	1	37.03	$23,183.00
011	Revegetate 6.74 ac creek areas	REVEGE	1	14.00	$11,159.00
012	Mobilization/Demobilization of Equipment	MOBILIZE	1	12.04	$21,465.00
		SUBTOTALS:		**310.58**	**$145,910**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$2,947.38
Performance bond:	1.05	Total =	$1,532.06
Job superintendent:	0.00	Total =	$0.00
Profit:	10.00	Total =	$14,591.00
		TOTAL O & P =	$19,070.44
		CONTRACT AMOUNT (direct + O & P) =	$164,980.44

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	500.00	Total =	500.00
Engineering work and/or contract/bid preparation:	0.00	Total =	$0.00
Reclamation management and/or administration:	5.00		$8,249.02
CONTINGENCY:	0.00	Total =	$0.00
		TOTAL INDIRECT COST =	$27,819.46
		TOTAL BOND AMOUNT (direct + indirect) =	**$173,729.46**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **Backfill 1,000 ft vertical highwall to 3H:1V in Area 1**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-001
User: AME

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: CAT 950H Horsepower: 197
Attachment 1: ROPS Cab Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$26.14	NA
Operating Cost/Hour:	$30.84	100
Operator Cost/Hour:	$40.90	NA
Total Unit Cost/Hour:	$97.89	
Total Fleet Cost/Hour:	$97.89	

MATERIAL QUANTITIES

Initial volume: 18,000 CCY Swell factor: 1.125
Loose volume: **20,250** LCY

Source of estimated volume: 1,000’ L x 18 ft H from vertical to 3H:1V
Source 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:	Material 1/8” to 3/4” diameter -0.02	-0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 0.00	0.000	(Cat HB)
Truck Ownership:	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:	-0.100	minutes
	Adjusted Basic Cycle Time:	0.400	minutes

Rolling Resistance – Road Conditions

Haul: Soft, rutted dirt, no maintenance or water, 4” tire penetration 8.0
Return: Soft, rutted dirt, no maintenance or water, 4” tire penetration 8.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source
Haul Route:	350	2.00	8.00	10.00	0.4723	(Cat HB)
Return Route:	350	-2.00	8.00	6.00	0.3158	(Cat HB)

Total Travel Time:	0.7881	minutes
Total Cycle Time:	**1.1881**	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: 6990 feet

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

Unadjusted Hourly Unit Production:	238.86	LCY/Hour
Adjusted Hourly Unit Production:	198.26	LCY/Hour
Adjusted Hourly Fleet Production:	**198.26**	LCY/Hour

JOB TIME AND COST

Fleet size:	1	Loader(s)	Total job time:	**102.14**	Hours
Unit cost:	$0.494	/LCY	Total job cost:	**$9,999**	

BULLDOZER RIPPING WORK

Task description: **Rip stockpiling/processing areas in Area 1**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 002 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-002
User: AME

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

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

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$93.62	NA
Operating Cost/Hour:	$73.35	100
Ripper Ownership Cost/Hour:	$8.93	NA
Ripper Operating Cost/Hour:	$7.78	100
Operator Cost/Hour:	$41.52	NA
Total Unit Cost/Hour:	$225.20	

Total Fleet Cost/Hour: **$225.20**

MATERIAL QUANTITIES

Selected estimating method: Area

Alternate Methods:

Seismic: NA Bank Volume: NA BCY NA
Area: 10.80 acres Rip Depth (ft): 2.00 Volume: 34,848 BCY or CCY

Source of estimated quantity: DRMS estimate 3.4 ac OB pile + 7.4 ac pit floor and piles

HOURLY PRODUCTION

Seismic:

Seismic Velocity: NA feet/second

Area:

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

Job Condition Correction Factors

Unadjusted Hourly Unit Production: 0.800 Acres/hr

Site Altitude:	6,990	feet
Altitude Adj:	1.00	(CAT HB)
Job Efficiency:	0.83	(1 shift/day)
Net Correction:	0.83	multiplier

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

JOB TIME AND COST

Fleet size: 1 Grader(s) Total job time: **16.27** Hours

Unit cost: $339.348 Per acre Total job cost: **$3,665**

SCRAPER TEAM WORK

Task description: **Retopsoil 17.14 ac at 8 in depth in Area 1**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 003 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-003
User: AME

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:	NA
Road Maintenance –Motor Grader:	CAT 16M
-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:	$155.61	NA	$93.62	NA	$77.19	$12.39
Operating cost/hour:	$166.86	NA	$73.35	NA	$63.34	$26.02
%Utilization-ripper:	NA	NA	NA	NA	50	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$4.07	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$1.77	$0.00
Operator cost/hour:	$31.05	NA	$41.52	NA	$28.69	$0.00
Unit Subtotals:	$353.51	NA	$208.49	NA	$175.05	$38.41
Number of Units:	1	0	1	0	1	1
Group Subtotals:	Work:	$353.51	Support:	$208.49	Maint:	$213.46

Total work team cost/hour: **$775.46**

MATERIAL QUANTITIES

Initial volume: 18,435 CCY Swell factor: 1.215
Loose volume: **22,399** LCY

Source of estimated volume: 17.14 ac x 8 in depth, avg 800 ft distance
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 1,600 lbs/LCY
Material description: Top Soil
Rated Payload: 81,600 pounds
Payload Capacity: 51.00 LCY

Scraper Bowl (volume) Basis:

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

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 6990 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 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	1.00	3.00	4.00	2394	0.49

Haul Time: **0.49** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	800.00	-1.00	3.00	2.00	2960	0.39

Return Time: **0.39** minutes

Total Scraper team cycle time: **2.28** minutes
Adjusted for job conditions: 633.42 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 633.42 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **633.42** LCY/Hour

Unadjusted unit production/hour: 763.16 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **35.36** Hours

Unit cost: $1.224 /LCY Total job cost: **$27,421**

REVEGETATION WORK

Task description: **Revegetate 17.14 ac in Area 1**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 004 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-004
User: AME

Agency or organization name: DRMS

FERTILIZING

Materials

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

Application

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

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	$92.77
Weed control spraying (MEANS 31 31 16.13 3100)	$193.60
Total Tilling Cost/Acre	**$286.37**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Big Bluestem - Native	5.50	16.41	$57.75
Blue Grama - Native	1.50	24.48	$22.28
Sideoats Grama - Vaughn	4.50	14.77	$46.08
Western Wheatgrass - Native	8.00	20.20	$57.36
Totals Seed Mix	19.50	75.87	**$183.47**

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	$288.00	$576.00
Total Mulch Materials Cost/Acre				**$576.00**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$68.78
Weed spray, hand, non-aquatic area, nox. [DMG]	$184.32
Total Mulch Application Cost/Acre	**$253.10**

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: 17.14
Estimated Failure Rate: 30%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,530.94
Cost /Acre*: $415.47

Initial Job Cost: **$26,240.31**
Reseeding Job Cost: **$2,136.35**
Total Job Cost: **$28,377**
Job Hours: **34.00**

BULLDOZER WORK

Task description: **Grade 2.12 ac in Area 2**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-005
User: AME

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: 3-shank ripper
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$93.62	NA
Operating Cost/Hour:	$73.35	100
Ripper own. Cost/Hour:	$8.93	NA
Ripper op. Cost/Hour:	$3.89	50
Operator Cost/Hour:	$41.52	NA

Total unit Cost/Hour: $221.31
Total Fleet Cost/Hour: **$221.31**

MATERIAL QUANTITIES

Initial Volume: 6,840
Swell factor: 1.000
Loose volume: **6,840** LCY

Source of estimated volume: 2.12 ac x 2 ft
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

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

Materials consistency description: Loose stockpile 1.2

Average push gradient: 5 %
Average site altitude: 6,990 feet

Material weight: 2,650 lbs/LCY

Weight description: Decomposed rock - 25% Rock, 75% Earth

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	1.200	(CAT HB)
Dozing method:	1.100	(50% SL)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.800	(FND-RF)
Push gradient:	0.903	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5152

Adjusted unit production: 721.28 LCY/hr
Adjusted fleet production: **721.28** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.307/LCY

Total job time: **9.48** Hours
Total job cost: **$2,099**

SCRAPER TEAM WORK

Task description: **Retopsoil 2.12 ac at 8 in depth in Area 2**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 006 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-006
User: AME

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:	NA
Road Maintenance –Motor Grader:	CAT 16M
-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:	$155.61	NA	$93.62	NA	$77.19	$12.39
Operating cost/hour:	$166.86	NA	$73.35	NA	$63.34	$26.02
%Utilization-ripper:	NA	NA	NA	NA	50	NA
Ripper own. cost/hour:	NA	NA	$0.00	NA	$4.07	$0.00
Ripper op. cost/hour:	NA	NA	$0.00	NA	$1.77	$0.00
Operator cost/hour:	$31.05	NA	$41.52	NA	$28.69	$0.00
Unit Subtotals:	$353.51	NA	$208.49	NA	$175.05	$38.41
Number of Units:	1	0	1	0	1	1
Group Subtotals:	Work:	$353.51	Support:	$208.49	Maint:	$213.46

Total work team cost/hour: **$775.46**

MATERIAL QUANTITIES

Initial volume: 2,280 CCY Swell factor: 1.215
Loose volume: **2,770** LCY

Source of estimated volume: 2.12 ac x 8 in depth, avg 2,000 ft distance
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 1,600 lbs/LCY
Material description: Top Soil
Rated Payload: 81,600 pounds
Payload Capacity: 51.00 LCY

Scraper Bowl (volume) Basis:

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

Cycle Time:

Scraper Loading Time: 0.80 Minutes
Maneuver and Spread Time: 0.60 Minutes

Job Condition Correction: Site Altitude: 6990 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 3.0

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	3.00	3.00	6.00	1477	1.41

Haul Time: **1.41** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2000.00	-3.00	3.00	0.00	2965	0.78

Return Time: **0.78** minutes

Total Scraper team cycle time: **3.59** minutes
Adjusted for job conditions: 402.28 LCY/Hour
Selected Number of Scrapers: 1 Scraper(s)
Adjusted single scraper team (unit) hourly production: 402.28 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **402.28** LCY/Hour

Unadjusted unit production/hour: 484.68 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **6.89** Hours

Unit cost: $1.928 /LCY Total job cost: **$5,340**

REVEGETATION WORK

Task description: **Revegetate 2.12 ac in Area 2**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 007 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-007
User: AME

Agency or organization name: DRMS

FERTILIZING

Materials

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

Application

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

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	$92.77
Weed control spraying (MEANS 31 31 16.13 3100)	$193.60
Total Tilling Cost/Acre	**$286.37**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Big Bluestem - Native	5.50	16.41	$57.75
Blue Grama - Native	1.50	24.48	$22.28
Sideoats Grama - Vaughn	4.50	14.77	$46.08
Western Wheatgrass - Native	8.00	20.20	$57.36
Totals Seed Mix	19.50	75.87	**$183.47**

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	$288.00	$576.00
Total Mulch Materials Cost/Acre				**$576.00**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$68.78
Weed spray, hand, non-aquatic area, nox. [DMG]	$184.32
Total Mulch Application Cost/Acre	**$253.10**

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: 2.12
Estimated Failure Rate: 30%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,530.94
Cost /Acre*: $415.47

Initial Job Cost: **$3,245.59**
Reseeding Job Cost: **$264.24**
Total Job Cost: **$3,510**
Job Hours: **4.00**

DEMOLITION WORK

Task description: **Demolition of scale and scale house**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 008 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-008
User: AME

Agency or organization name: DRMS

UNIT COSTS **Location adjustment: 91.50 %**

Structure or Item Description	Dimensions	Demolition Menu Selection	Quantity	Unit	Unit Cost	Total Cost
Truck Scale Demo	1,100 SF	Floor, concrete, demolition only, average reinforcing - 12 in. thick	1,100.00	SF	$1.59	$1,749.00
Scale House Demo	160 SF x 8 F	Demo. only, small or single buildings (single story) - Wood structures	1,280.00	CF	$0.18	$225.28
Loading and Off-site Disposal	40.7 CY + 47.4 CY	Loading and 2 mile haul, no salvage - Machine loading	88.10	CY	$17.20	$1,515.32

Job Hours: 10.00 **Subtotal (unadjusted): $3,489.60** **Total Cost (adjusted for location): $3,192.98**

BULLDOZER WORK

Task description: **Backfill creek pits and grade slopes to 3H:1V**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 009 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-010
User: AME

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D8T - 8SU
Horsepower: 310
Blade Type: Semi-Universal
Attachment: 3-shank ripper
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$93.62	NA
Operating Cost/Hour:	$73.35	100
Ripper own. Cost/Hour:	$8.93	NA
Ripper op. Cost/Hour:	$3.89	50
Operator Cost/Hour:	$41.52	NA

Total unit Cost/Hour: $221.31
Total Fleet Cost/Hour: **$221.31**

MATERIAL QUANTITIES

Initial Volume: 10,164
Swell factor: 1.124
Loose volume: **11,420** LCY

Source of estimated volume: 1.4 ac (N side) + 0.7 ac (S side), 3 ft deep to BF GW
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

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

Materials consistency description: Compacted fill or embankment 0.9

Average push gradient: 0 %
Average site altitude: 6,990 feet

Material weight: 2,900 lbs/LCY

Weight description: Sand and gravel - Dry

Job Condition Correction Factor		Source
Operator Skill:	1.000	(EXCL.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.100	(50% SL)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)

Spoil pile:	0.700	(FND-MF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.793	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4561

Adjusted unit production: 388.87 LCY/hr
Adjusted fleet production: **388.87** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)
Unit cost: $0.569/LCY

Total job time: **29.37** Hours
Total job cost: **$6,499**

TRUCK/LOADER TEAM WORK

Task description: **Haul topsoil to creek areas, spread at 8 in depth**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 010 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-011
User: AME

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Shift basis: 1 per day

	Equipment Description
Truck Loader Team -Truck:	Generic 8-10 cy, 6x4
-Loader:	CAT 950H
Support Equipment -Load Area:	NA
-Dump Area:	Cat D8T - 8SU
Road Maintenance –Motor Grader:	CAT 16M
-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	NA	100	100	100
Ownership cost/hour:	$15.87	$26.14	NA	$93.62	$77.19	$12.39
Operating cost/hour:	$40.15	$30.84	NA	$73.35	$63.34	$26.02
%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:	$0.00	$40.90	NA	$41.52	$28.69	$0.00
Unit Subtotals:	$56.02	$97.89	NA	$208.49	$169.22	$38.41
Number of Units:	2	1	0	1	1	1
Group Subtotals:	Work:	$209.93	Support:	$208.49	Maint:	$207.63

Total work team cost/hour: **$626.05**

MATERIAL QUANTITIES

Initial volume: 7,250 CCY Swell factor: 1.215
Loose volume: **8,809** LCY

Source of estimated volume: 6.74 ac x 8 in depth, topsoil from Area 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: 1,600 Pounds/LCY
Description: Top Soil
Rated Payload: 27,280 Pounds
Payload Capacity: 17.05 LCY

Truck Bed (volume) Basis:

Struck Volume:	8.00	LCY
Heaped Volume:	10.00	LCY
Average Volume:	9.00	LCY
Adjusted Volume:	10.00	LCY

Final Truck Volume Based on Number of Loader Passes: **9.46** LCY

Loading Tool Capacity

Bucket Size Class: NA

Rated Capacity:	4.300	LCY (heaped)
Bucket Fill Factor:	1.100	Other - rock/dirt mixtures (100-120%) 1.100
Adjusted Capacity:	**4.730**	LCY

Job Condition Corrections: Site Altitude (ft.): 6990 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: 2 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): 0.500 minutes

Cycle Time Factors		Factor (min.)	Source
Material:	Material 1/8" to 3/4" diameter -0.02	-0.020	(Cat HB)
Stockpile:	Conveyor or dozer piled 10 ft. high and up 0.00	0.000	(Cat HB)
Truck Ownership:	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:	-0.100	minutes
	Adjusted Loader Cycle Time:	**0.400**	minutes
	Net Load Time per Truck:	**0.500**	minutes

Truck Cycle Time:

Truck Exchange Time:	0.50	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Load Time:	0.500	Minutes	Adjusted for site altitude:	0.500	Minutes
Truck Maneuver and Dump Time:	0.80	Minutes	Adjusted for site altitude:	0.800	Minutes

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

Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2600.00	2.00	3.00	5.00	2218	1.241

Haul Time: **1.241** minutes

Return Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	2600.00	-2.00	3.00	1.00	2913	0.920

Return Time: **0.920** minutes
Total Truck Cycle Time: **3.961** minutes

Loading Tool unit Production 567.60 LCY/Hour Adjusted for job efficiency: 471.11 LCY/Hour

Truck Unit Production 143.30 LCY/Hour Adjusted for job efficiency: 118.94 LCY/Hour

Optimal No. of Trucks: 4 Truck(s) Selected Number of Trucks: 2 Truck(s)

Adjusted hourly truck team production: 237.87 LCY/Hour
Adjusted single truck/loader team production: 237.87 LCY/Hour
Adjusted multiple truck/loader team production: **237.87** LCY/Hour

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **37.03** Hours

Unit cost: $2.632 /LCY Total job cost: **$23,183**

REVEGETATION WORK

Task description: **Revegetate 6.74 ac creek areas**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 011 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-012
User: AME

Agency or organization name: DRMS

FERTILIZING

Materials

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

Application

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

TILLING

Description	Cost /Acre
Chisel plowing {DMG}	$92.77
Weed control spraying (MEANS 31 31 16.13 3100)	$193.60
Total Tilling Cost/Acre	**$286.37**

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Big Bluestem - Native	5.50	16.41	$57.75
Blue Grama - Native	1.50	24.48	$22.28
Sideoats Grama - Vaughn	4.50	14.77	$46.08
Western Wheatgrass - Native	8.00	20.20	$57.36
Totals Seed Mix	19.50	75.87	**$183.47**

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	$288.00	$576.00
Total Mulch Materials Cost/Acre				**$576.00**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$68.78
Weed spray, hand, non-aquatic area, nox. [DMG]	$184.32
Total Mulch Application Cost/Acre	**$253.10**

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: 6.74
Estimated Failure Rate: 30%
*Selected Replanting Work Items: SEEDING

Cost /Acre: $1,530.94
Cost /Acre*: $415.47

Initial Job Cost: **$10,318.54**
Reseeding Job Cost: **$840.08**
Total Job Cost: **$11,159**
Job Hours: **14.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mobilization/Demobilization of Equipment**

Site: **Robinson Sons Gravel Pit No. 1** Permit Action: AM-01 Bond Estimate Permit/Job#: M2008076

PROJECT IDENTIFICATION

Task #: 012 State: Colorado Abbreviation: None
Date: 12/10/2018 County: Las Animas Filename: M076-013
User: AME

Agency or organization name: DRMS

EQUIPMENT TRANSPORT RIG COST

Shift basis: 1 per day
Cost Data Source: CRG Data

Truck Tractor Description: GENERIC ON-HIGHWAY TRUCK TRACTOR, 6X4, DIESEL POWERED, 400 HP (2ND HALF, 2006)

Truck Trailer Description: GENERIC FOLDING GOOSENECK, DROP DECK EQUIPMENT TRAILER (25T, 50T, AND 100T)

Cost Breakdown:

Available Rig Capacities	0-25 Tons	26-50 Tons	51+ Tons
Ownership Cost/Hour:	$16.63	$18.37	$22.33
Operating Cost/Hour:	$44.38	$46.13	$50.07
Operator Cost/Hour:	$27.66	$27.66	$27.66
Helper Cost/Hour:	$0.00	$25.39	$25.39
Total Unit Cost/Hour:	$88.67	$117.55	$125.45

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
CAT 950H	20.13	$26.14	$88.67	2	$229.62	$177.34	$500.00
Cat D8T - 8SU	53.08	$102.55	$125.45	2	$456.00	$250.90	$750.00
Cat 637G	57.28	$155.61	$125.45	2	$562.12	$250.90	$500.00
CAT 16M	28.73	$77.19	$117.55	1	$194.74	$117.55	$500.00
Subtotals:					**$1,442.48**	**$796.69**	**$2,250.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Generic 8-10 cy, 6x4	$85.75	2	$171.50	$171.50
Water Tanker, 3,500 Gal.	$38.41	1	$38.41	$38.41
Drill/Broadcast Seeder with Tractor	$36.08	1	$36.08	$36.08
Subtotals:			**$245.99**	**$245.99**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	TRINIDAD	
Total one-way travel distance:	23.00	miles
Average Travel Speed:	45.00	mph

Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$21,213.73
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$251.46

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.51	0.51
Return Time (Hours):	0.51	0.51
Loading Time (Hours):	2.50	NA
Unloading Time (Hours):	2.50	NA
Subtotals:	6.02	1.02

JOB TIME AND COST

Total job time:	**12.04**	Hours
Total job cost:	**$21,465**	