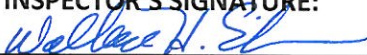




**COLORADO DIVISION OF RECLAMATION, MINING AND SAFETY**  
**MINERALS PROGRAM INSPECTION REPORT**  
**PHONE: (303) 866-3567**

The Division of Reclamation, Mining and Safety has conducted an inspection of the mining operation noted below. This report documents observations concerning compliance with the terms of the permit and applicable rules and regulations of the Mined Land Reclamation Board.

<b>MINE NAME:</b> Upper Animas Sand and Gravel Pit	<b>MINE/PROSPECTING ID#:</b> M-2005-065	<b>MINERAL:</b> Sand and gravel	<b>COUNTY:</b> San Juan
<b>INSPECTION TYPE:</b> Multi Person Inspection	<b>INSPECTOR(S):</b> Wallace Erickson, Lucas West	<b>INSP. DATE:</b> August 6, 2014	<b>INSP. TIME:</b> 15:30
<b>OPERATOR:</b> Jack Clark, Jr.	<b>OPERATOR REPRESENTATIVE:</b> Charles Ponchak	<b>TYPE OF OPERATION:</b> 112c – In-stream, pond construction	
<b>REASON FOR INSPECTION:</b> Surety Related	<b>BOND CALCULATION TYPE:</b> Complete Bond	<b>BOND AMOUNT:</b> \$32,500.00	
<b>DATE OF COMPLAINT:</b> NA	<b>POST INSP. CONTACTS:</b> None	<b>JOINT INSP. AGENCY:</b> None	
<b>WEATHER:</b> Cloudy	<b>INSPECTOR'S SIGNATURE:</b> 	<b>SIGNATURE DATE:</b> October 16, 2014	

**GENERAL INSPECTION TOPICS**

This list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each. No problems or possible violations were noted during the inspection. The mine operation was found to be in full compliance with Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for the Extraction of Construction Materials and/or for Hard Rock, Metal and Designated Mining Operations. Any person engaged in any mining operation shall notify the office of any failure or imminent failure, as soon as reasonably practicable after such person has knowledge of such condition or of any impoundment, embankment, or slope that poses a reasonable potential for danger to any persons or property or to the environment; or any environmental protection facility designed to contain or control chemicals or waste which are acid or toxic-forming, as identified in the permit.

(AR) RECORDS-----Y	(FN) FINANCIAL WARRANTY-----Y	(RD) ROADS-----Y
(HB) HYDROLOGIC BALANCE-----Y	(BG) BACKFILL & GRADING-----Y	(EX) EXPLOSIVES-----NA
(PW) PROCESSING WASTE/TAILING-----Y	(SF) PROCESSING FACILITIES-----NA	(TS) TOPSOIL-----Y
(MP) GENL MINE PLAN COMPLIANCE-----Y	(FW) FISH & WILDLIFE-----Y	(RV) REVEGETATION-----Y
(SM) SIGNS AND MARKERS-----Y	(SP) STORM WATER MGT PLAN-----Y	(SB) COMPLETE INSP-----Y
(ES) OVERBURDEN/DEV. WASTE-----Y	(SC) EROSION/SEDIMENTATION-----Y	(RS) RECL PLAN/COMP-----Y
(AT) ACID OR TOXIC MATERIALS-----Y	(OD) OFF-SITE DAMAGE-----Y	(ST) STIPULATIONS-----Y

Y = Inspected and found in compliance / N = Not inspected / NA = Not applicable to this operation / PB = Problem cited / PV = Possible violation cited

### **OBSERVATIONS**

This inspection occurred as part of the Division's monitoring program of permitted operations and to evaluate the current cost of reclamation in response to a surety reduction request (SR-01). The Upper Animas Sand and Gravel permit is approved for 16.3 acres affected lands, which includes the Pit 1, 2, 3 and 4 areas, for the extraction and processing of construction materials. Portions of the permit area are located within the active floodplain of the Animas River and/or the alluvial fan for Maggie Creek. Affected lands will be reclaimed to support rangeland post-mining land use, which will include the construction of four ponds. The Division holds \$32,500 financial warranty. This report is accompanied by one image from Google Earth, five photographs taken during the inspection, and a preliminary updated reclamation cost estimation totaling \$20,404.67.

**Pit 1 Area:** According to the reclamation plan, the excavation activity at Pit 1 will result in pit depth of 12 - 15 feet below native ground with pit slopes not steeper than 3H:1V. Pit depth will extend below the water table, exposing ground water in accordance with Division of Water Resources Permit No. 63417-F and Water Court Case No. 11CW69. DWR has indicated a new well permit for Pit 1 is required. Pit 1 is located within the active flood plain of the Animas River.

As shown on the Google Earth image and Photos 1 and 2, the operation has affected all of the Pit 1 area but the excavation has not yet extended to the full depth anticipated in the approved reclamation plan. Ground water was exposed at the far south end of Pit 1. Pit slopes were variable and ranged from not steeper than 3H:1V for approximately 700 linear feet along the northeast sides of the pit, to 1.5H:1V for the remaining 1,400 linear feet of pit perimeter. Vegetative cover was establishing for pit slopes at final grade. Topsoil stockpile was observed along the east side of Pit 1 area.

**Pit 2 Area:** According to the reclamation plan, the excavation activity at Pit 2 will result in pit depth of 35 – 40 feet below native ground with pit slopes not steeper than 3H:1V. Pit depth will not extend below the water table and the operation is not authorized to expose ground water at Pit 2. However, Pit 2 may be filled with water from Maggie Creek in accordance with Water Court Case No. 11CW69. Pit 2 is located within the alluvial fan of Maggie Creek.

As shown on the Google Earth image and Photos 3 and 4, the excavation activity appears complete for the western portions of Pit 2 and approximately 60% complete for the eastern portions of Pit 2. The pit perimeter may be extended along the southeast corner of Pit 2. All pit slopes, approximately 1,440 linear feet, were at final grade, not steeper than 3H:1V. Vegetative cover was establishing for all 3H:1V slopes. Topsoil stockpile was observed along the east side of Pit 2 area.

**Pit 3 Area:** The excavation at Pit 3 has not commenced. The lands have been affected only by material processing and stockpiling activities. A substantial stockpile of processed material was located at Pit 3. Topsoil was stockpiled along the east side of Pit 3 area. Comments from DWR indicate the Operator does not yet have a clear water right to fill a pond at Pit 3.

**Pit 4 Area:** The excavation at Pit 4 has not commenced. The lands appear to have been previously affected by material processing and stockpiling activities, but subsequently reclaimed. Vegetative cover was well established. Topsoil stockpile was observed along the east side of Pit 4 area. Comments from DWR indicate the Operator does not yet have a clear water right to fill a pond at Pit 4.

**Financial Warranty:** Pursuant to Rule 4.2.1(4), the Division has completed a preliminary estimation for the current cost of reclamation totaling \$20,404.67. Please find enclosed 19 pages of summary, work sheets and drawings utilized by the Division to estimate the current cost of reclamation. The estimation assumes continued mining to occur at Pit 2, thus the slope reduction task for Pit 2, task 002. Additional information and/or clarification from the Operator will cause the Division to re-evaluate its preliminary reclamation cost estimation.

**SR-01:** Based on observations made during the inspection and recorded in this report the Division recommends approval of the Operator's request for surety reduction (SR-01). The available information indicates the existing \$32,500 financial warranty may be reduced to \$20,405, representing a reduction of \$12,095. However, the financial warranty shall not be less than \$20,405 to ensure the successful completion of reclamation.

Response to this inspection report should be directed to Wally Erickson at the Division's office in Durango at 691 County Road 233, Suite A-2, Durango, Colorado 81301, phone (970) 247-5469, email [wally.erickson@state.co.us](mailto:wally.erickson@state.co.us).

**Inspection Contact Address**

Jack Clark, Jr.  
P.O. Box 767  
Silverton, CO 81433

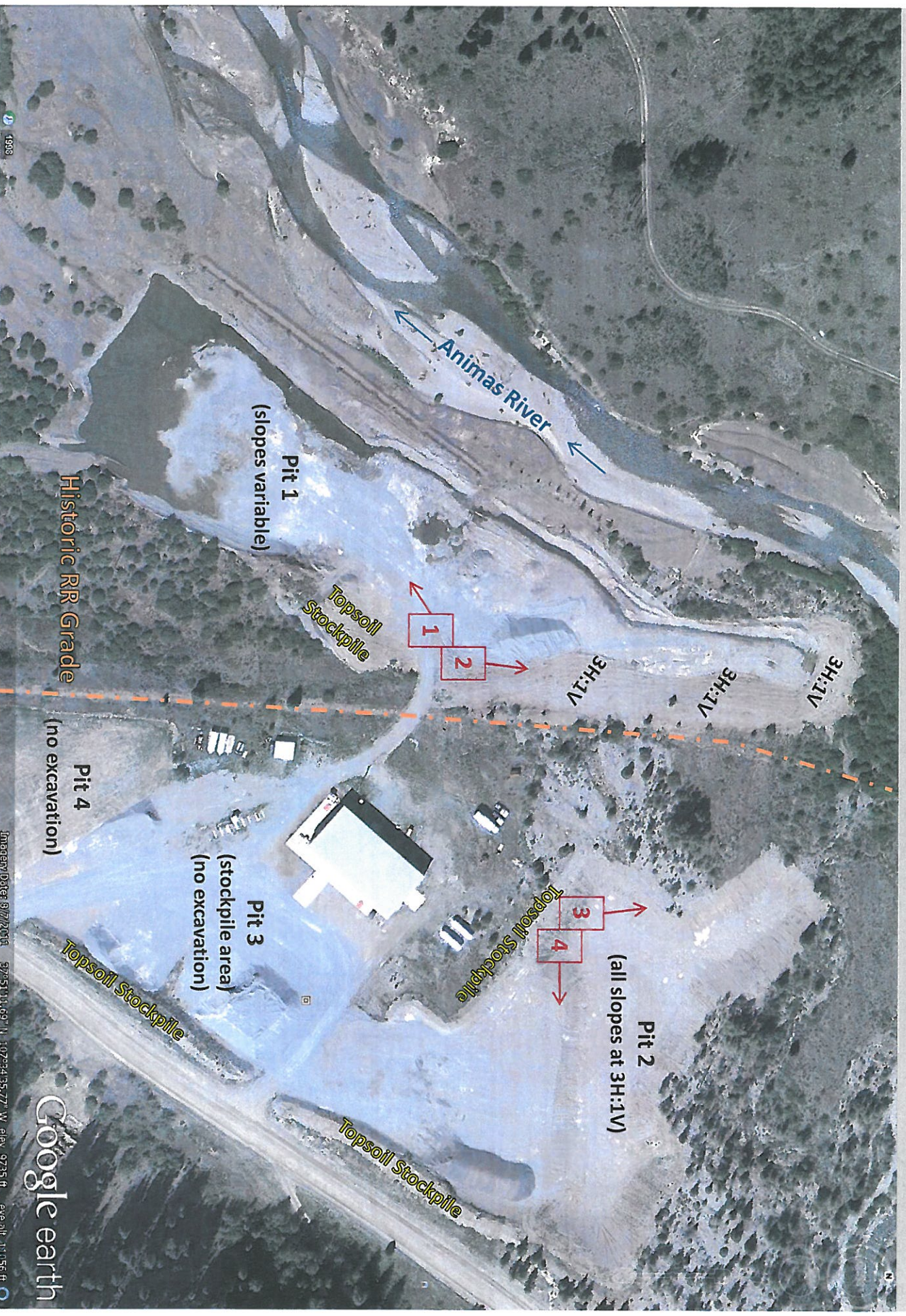
Enclosure:    1)     One image from Google Earth;  
                  2)     Five photographs taken during the inspection; and  
                  3)     Reclamation cost estimation totaling \$20,404.67

cc w/enclosure:   Charles Ponchak  
                          Consulting Geologist  
                          15292 6050 Road  
                          Montrose, CO 81403

ec w/enclosure:   Russ Means, DRMS GJFO

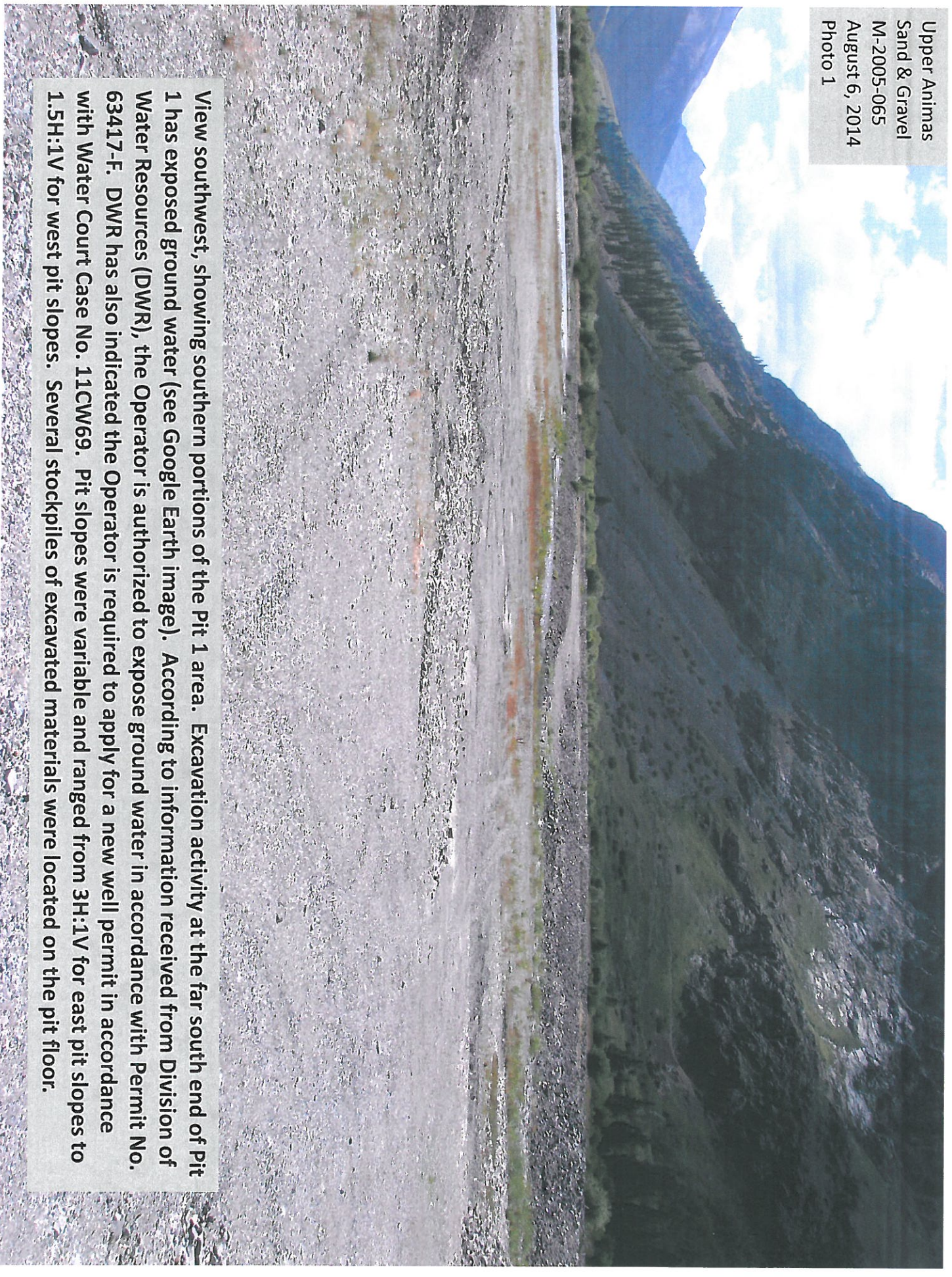


Upper Animas Sand & Gravel, M-2005-065, Google Earth imagery date August 7, 2011, view from approximately 1,300 feet above ground surface and showing portions of the permit area. Photo locations shown in **red**.





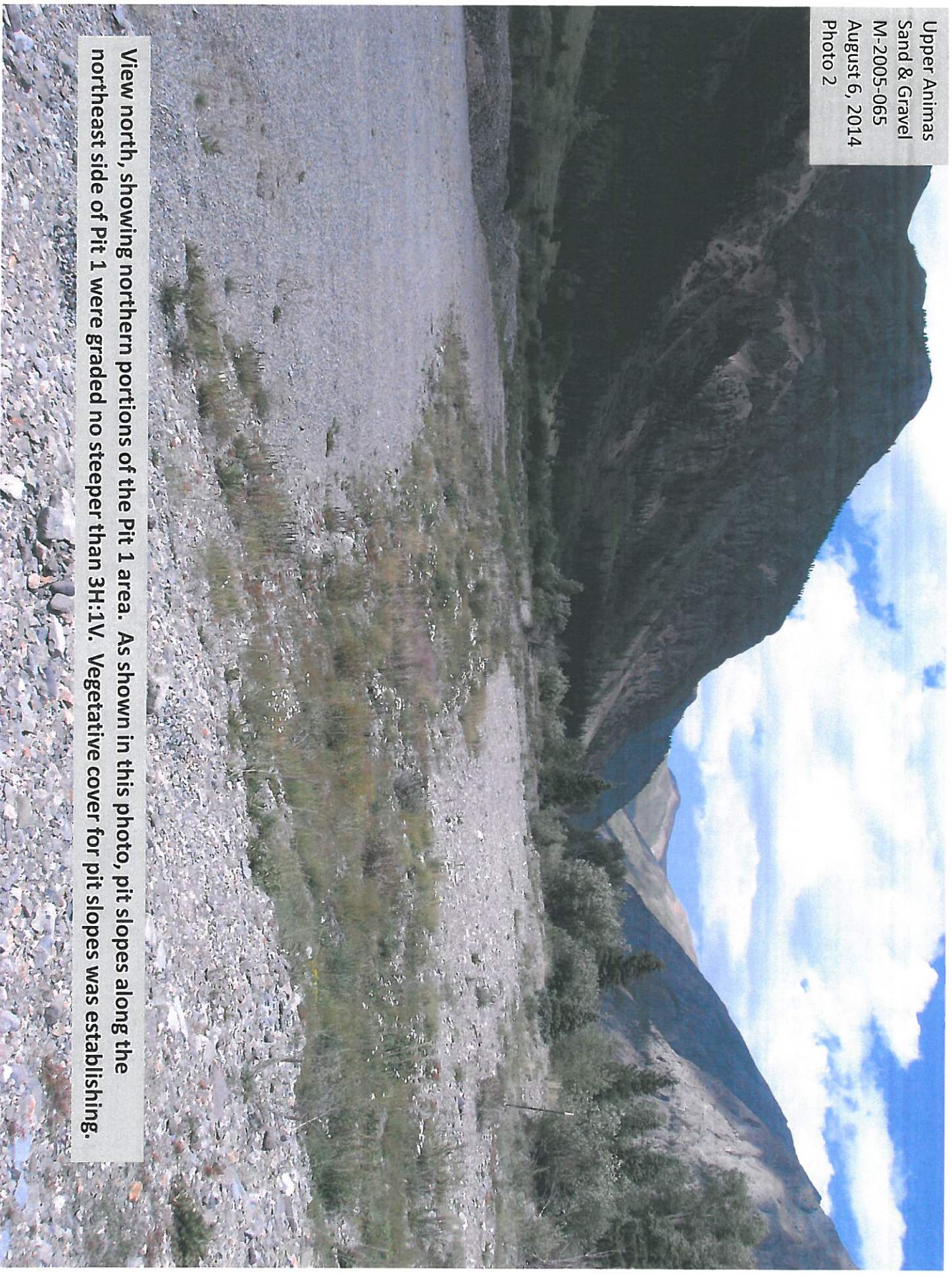
View southwest, showing southern portions of the Pit 1 area. Excavation activity at the far south end of Pit 1 has exposed ground water (see Google Earth image). According to information received from Division of Water Resources (DWR), the Operator is authorized to expose ground water in accordance with Permit No. 63417-F. DWR has also indicated the Operator is required to apply for a new well permit in accordance with Water Court Case No. 11CW69. Pit slopes were variable and ranged from 3H:1V for east pit slopes to 1.5H:1V for west pit slopes. Several stockpiles of excavated materials were located on the pit floor.





Upper Animas  
Sand & Gravel  
M-2005-065  
August 6, 2014  
Photo 2

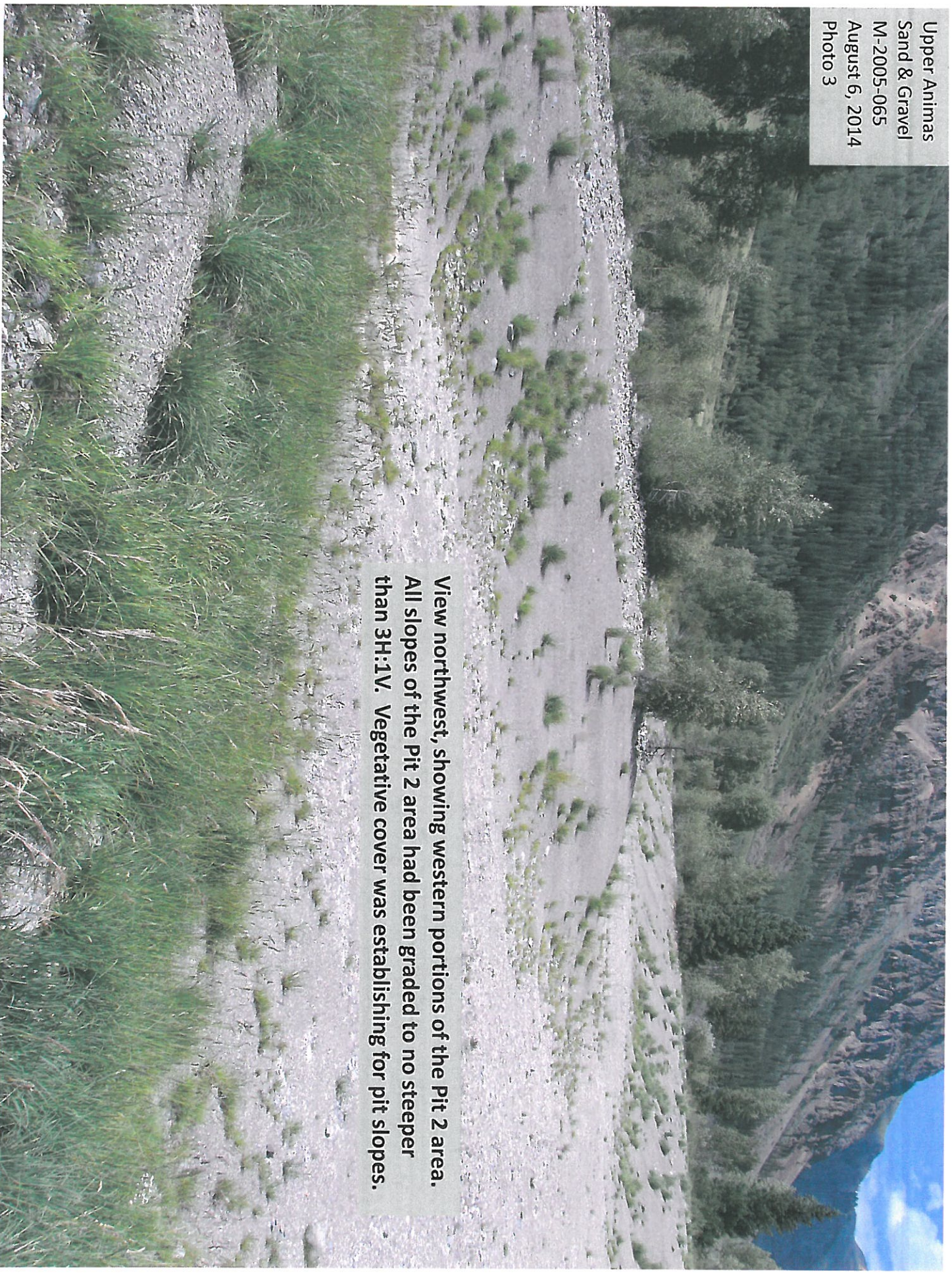
View north, showing northern portions of the Pit 1 area. As shown in this photo, pit slopes along the northeast side of Pit 1 were graded no steeper than 3H:1V. Vegetative cover for pit slopes was establishing.





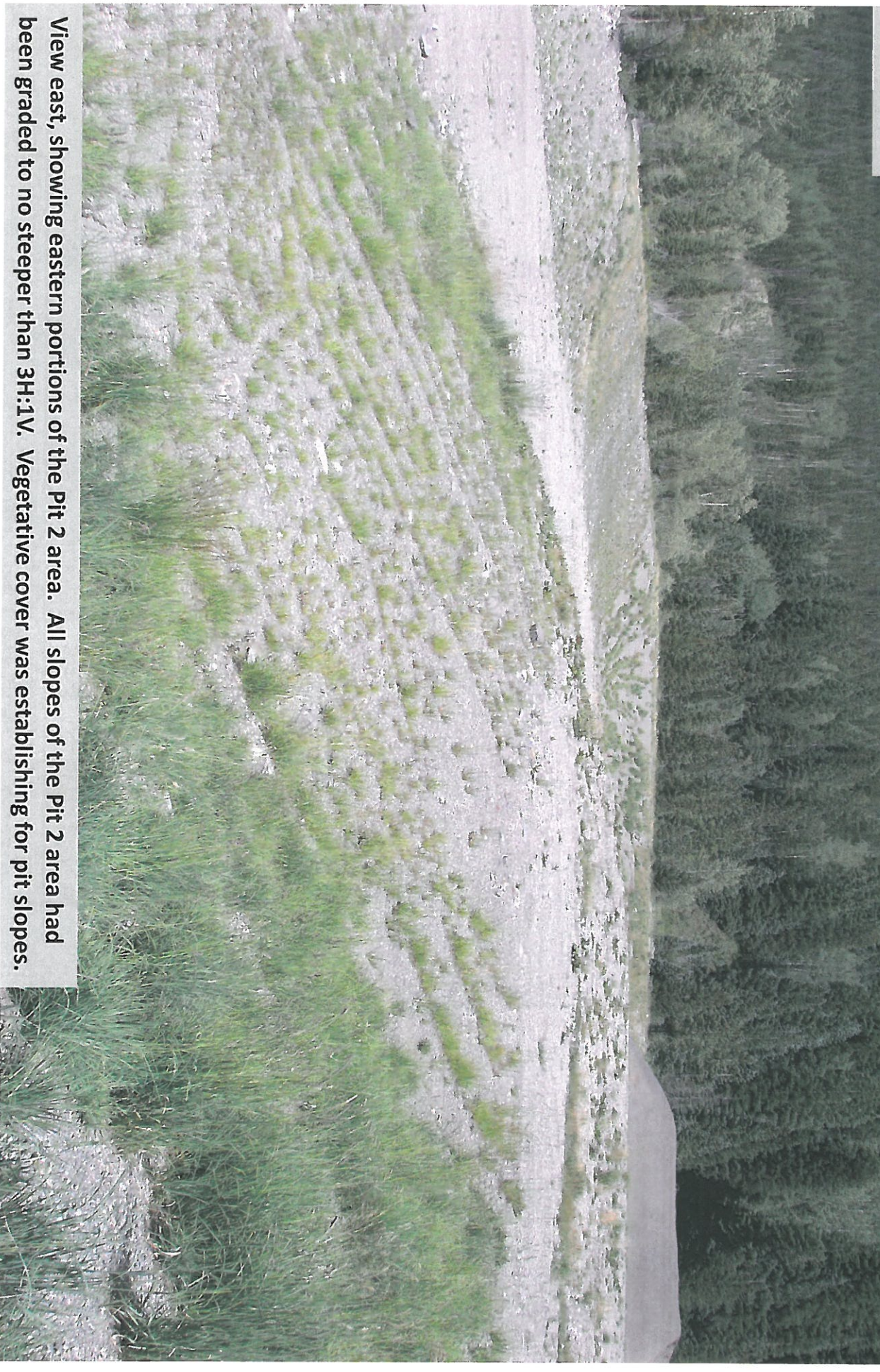
Upper Animas  
Sand & Gravel  
M-2005-065  
August 6, 2014  
Photo 3

View northwest, showing western portions of the Pit 2 area. All slopes of the Pit 2 area had been graded to no steeper than 3H:1V. Vegetative cover was establishing for pit slopes.





Upper Animas  
Sand & Gravel  
M-2005-065  
August 6, 2014  
Photo 4



View east, showing eastern portions of the Pit 2 area. All slopes of the Pit 2 area had been graded to no steeper than 3H:1V. Vegetative cover was establishing for pit slopes.



## COST SUMMARY WORK

Task description: Summary of reclamation tasks and costs

Site: Upper Animas Sand and Gravel Pit Permit Action: SR-01 Permit/Job#: M2005065

### PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None  
Date: 10/15/2014 County: San Juan Filename: M065-000  
User: WHE

Agency or organization name: DRMS

### TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Pit 1 Highwall Reduction	DOZER	1	2.74	\$591.00
002	Pit 2 Assumed Highwall Reduction	DOZER	1	8.70	\$1,904.00
003	Rough Grade and Rip Pit 3 Area	DOZER	1	2.63	\$587.00
004	Pit 1 Topsoil Replacement	SCRAPER1	1	3.80	\$1,001.00
005	Pit 2 Topsoil Replacement	SCRAPER1	1	2.86	\$752.00
006	Pit 3 Topsoil Replacement	DOZER	1	3.34	\$719.00
007	Revegetate 2.7 Acres Affected Land	REVEGE	1	0.00	\$3,239.00
008	Haul reclamation equipment to and from job site	MOBILIZE	1	6.80	\$7,729.00
<b><u>SUBTOTALS:</u></b>				<b>30.87</b>	<b>\$16,522</b>

### INDIRECT COSTS

#### OVERHEAD AND PROFIT:

Liability insurance:	2.02%	Total =	\$333.74
Performance bond:	1.05%	Total =	\$173.48
Job superintendent:	10.00 hrs	Total =	\$751.60
Profit:	10.00%	Total =	\$1,652.20
		TOTAL O & P =	\$2,911.02
		CONTRACT AMOUNT (direct + O & P) =	\$19,433.02

#### LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	0.00	Total =	0.00
Engineering work and/or contract/bid preparation:	0.00%	Total =	\$0.00
Reclamation management and/or administration:	5.00%		\$971.65

CONTINGENCY: 0.00 Total = \$0.00

TOTAL INDIRECT COST = \$3,882.67

TOTAL BOND AMOUNT (direct + indirect) = \$20,404.67



**BULLDOZER WORK**Task description: Pit 1 Highwall ReductionSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 001  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-001Agency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8U  
Horsepower: 310  
Blade Type: Universal  
Attachment: 3-shank ripper  
Shift Basis: 1 per day  
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$69.05	NA
Operating Cost/Hour:	\$108.22	100
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$38.01	NA

Total unit Cost/Hour: \$215.28  
Total Fleet Cost/Hour: \$215.28**MATERIAL QUANTITIES**Initial Volume: 2,212  
Swell factor: 1.165  
Loose volume: 2,577 LCYSource of estimated volume: See attached drawing, "Pit 1 Highwall Reduction..."  
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feet  
Unadjusted hourly production: 1,627.0 LCY/hrMaterials consistency description: Partly consolidated stockpile 1.1Average push gradient: -15 %  
Average site altitude: 9,730 feetMaterial weight: 2,900 lbs/LCYWeight description: Decomposed rock - 50% Rock, 50% Earth**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.100	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)



Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.329	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.793	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.5773

Adjusted unit production: 939.27 LCY/hr

Adjusted fleet production: 939.27 LCY/hr

### **JOB TIME AND COST**

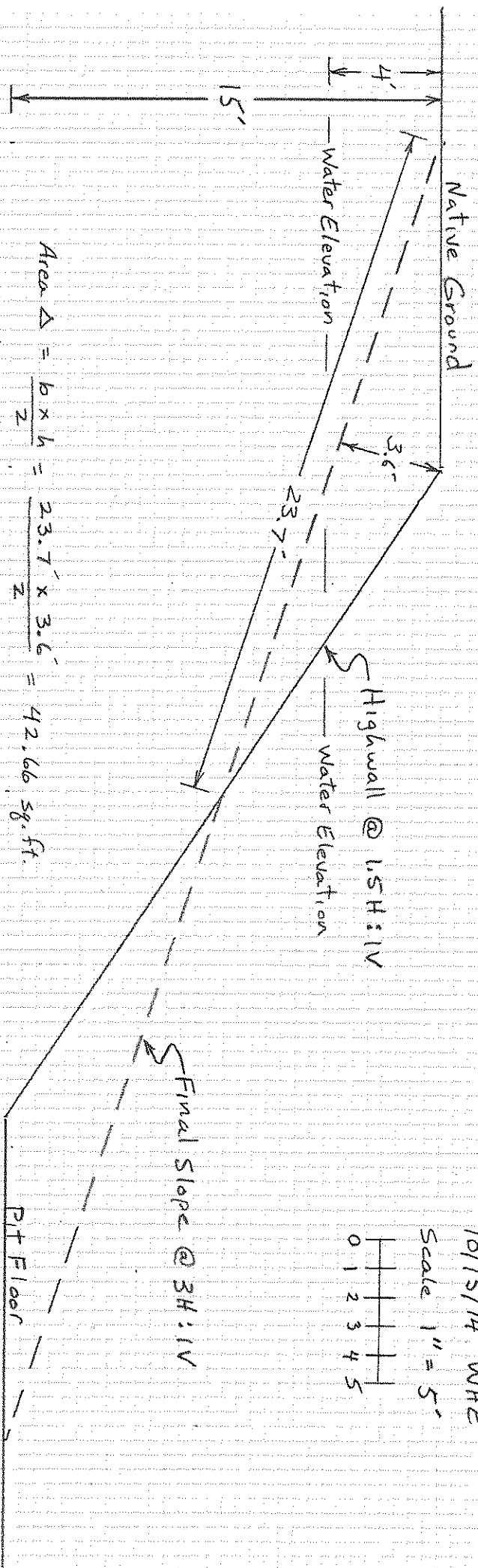
Fleet size: 1 Dozer(s)  
Unit cost: \$0.229/LCY

Total job time: 2.74 Hours  
Total job cost: \$591



# Pit 1 Highwall Reduction from 1.5H:1V to 3H:1V Balanced Cut & Fill

Upper Animas Sand & Gravel  
M-2005-065  
10/15/14 WHE  
Scale 1" = 5'



$$\text{Area } \Delta = \frac{b \times h}{2} = \frac{23.7' \times 3.6'}{2} = 42.66 \text{ sq. ft.}$$

$$\text{Material Quantity} = 1,400' \times 42.66 \text{ sq. ft.} = 59,724 \text{ cu. ft.}$$

$$= 2,212 \text{ cu. yd.}$$

Anticipated Pond fill to 4' of crest resulting in 12' of pit slope requiring topsoil replacement & revegetation

$$\text{Total perimeter Pit 1} = 700' + 1400' = 2100'$$

$$\text{Topsoil replacement above water elevation} = 2100' \times 12' = 25,200 \text{ sq. ft.}$$

$$\text{Topsoil quantity at 6" replacement depth} = 25,200 \text{ sq. ft.} \times 0.5' = 12,600 \text{ cu. ft. for Pit 1 slopes only}$$

$$= 466.67 \text{ cu. yd.}$$



**BULLDOZER WORK**Task description: Pit 2 Assumed Highwall ReductionSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 002  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-002Agency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8U  
Horsepower: 310  
Blade Type: Universal  
Attachment: 3-shank ripper  
Shift Basis: 1 per day  
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	<u>\$69.05</u>	<u>NA</u>
Operating Cost/Hour:	<u>\$108.22</u>	<u>100</u>
Ripper op. Cost/Hour:	<u>\$3.73</u>	<u>50</u>
Operator Cost/Hour:	<u>\$38.01</u>	<u>NA</u>

Total unit Cost/Hour: \$219.00  
Total Fleet Cost/Hour: \$219.00**MATERIAL QUANTITIES**Initial Volume: 7,152  
Swell factor: 1.250  
Loose volume: 8,940 LCYSource of estimated volume: See attached drawing, "Pit 2 Assumed Highwall Reduction..."  
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feet  
Unadjusted hourly production: 1,627.0 LCY/hrMaterials consistency description: Partly consolidated stockpile 1.1Average push gradient: -15 %  
Average site altitude: 9,730 feetMaterial weight: 2,650 lbs/LCYWeight description: Decomposed rock - 25% Rock, 75% Earth**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	<u>0.750</u>	<u>(AVG.)</u>
Material consistency:	<u>1.100</u>	<u>(CAT HB)</u>
Dozing method:	<u>1.000</u>	<u>(GEN.)</u>



Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.329	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.6319

Adjusted unit production: 1,028.10 LCY/hr  
Adjusted fleet production: 1028.1 LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)  
Unit cost: \$0.213/LCY  
  
Total job time: 8.70 Hours  
Total job cost: \$1,904



# Pit 2 Assumed Highwall Reduction from 1.5H:1V to 3H:1V Balanced Cut & Fill

Native Ground

4'  
Water  
Elevation

9.7'

Highwall @ 1.5H:1V

63.2'

Final Slope @ 3H:1V

Upper Areas Sand & Gravel  
M-2005-065  
10/15/14 WHE  
Scale 1" = 10'

Pit Floor

$$\text{Area } \Delta = \frac{b \times h}{2} = \frac{63.2' \times 9.7'}{2} = 306.5 \text{ sq. ft.}$$

Assume 630' of new highwall created to complete Pit 2

$$\begin{aligned} \text{Material Quantity} &= 630' \times 306.5 \text{ sq. ft.} \\ &= 193,095 \text{ cu. ft.} \\ &= 7,151.7 \text{ cu. yd.} \end{aligned}$$

Anticipated Pond Fill to 4' of crest resulting in 12' of pit slope requiring topsoil replacement & revegetation

Total Perimeter of completed Pit 2 = 1,800'

$$\text{Topsoil replacement above water elevation} = 1,800' \times 12' = 21,600 \text{ sq. ft.}$$

$$\begin{aligned} \text{Topsoil quantity at 6" replacement depth} &= 21,600 \text{ sq. ft.} \times 0.5' = 10,800 \text{ cu. ft.} \\ &= 400 \text{ cu. yd.} \end{aligned}$$



**BULLDOZER WORK**Task description: Rough Grade and Rip Pit 3 AreaSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 003  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-003Agency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8U  
Horsepower: 310  
Blade Type: Universal  
Attachment: 3-shank ripper  
Shift Basis: 1 per day  
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$69.05	NA
Operating Cost/Hour:	\$108.22	100
Ripper op. Cost/Hour:	\$7.46	100
Operator Cost/Hour:	\$38.01	NA

Total unit Cost/Hour: \$222.73  
Total Fleet Cost/Hour: \$222.73**MATERIAL QUANTITIES**Initial Volume: 1,333  
Swell factor: 1.250  
Loose volume: 1,667 LCYSource of estimated volume:  $(360' \times 200' \times 0.5'D) / 27 = 1333.33 \text{ cy}$   
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 50 feet  
Unadjusted hourly production: 1,627.0 LCY/hrMaterials consistency description: Compacted fill or embankment 0.9Average push gradient: 0 %  
Average site altitude: 9,730 feetMaterial weight: 2,650 lbs/LCYWeight description: Decomposed rock - 25% Rock, 75% Earth**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	0.900	(CAT HB))
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.868	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.3890

Adjusted unit production: 632.90 LCY/hr

Adjusted fleet production: 632.9 LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)

Unit cost: \$0.352/LCY

Total job time: 2.63 Hours

Total job cost: \$587



**SCRAPER TEAM WORK**Task description: Pit 1 Topsoil ReplacementSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 004  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-004Agency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 613C Series 2
-Dozer:	Cat D8T - 8U
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

<b><u>Cost Breakdown:</u></b>	<b><u>Scraper Work Team</u></b>		<b><u>Support Equipment</u></b>		<b><u>Maintenance Equipment</u></b>	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	25	NA	NA	NA	NA
Ownership cost/hour:	\$25.15	\$69.05	NA	NA	NA	NA
Operating cost/hour:	\$70.41	\$27.06	NA	NA	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Operator cost/hour:	\$33.56	\$38.01	NA	NA	NA	NA
Unit Subtotals:	\$129.12	\$134.11	NA	NA	NA	NA
Number of Units:	1	1	0	0	0	0
Group Subtotals:	Work:	\$263.23	Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$263.23****MATERIAL QUANTITIES**Initial volume: 467 CCY      Swell factor: 1.250  
Loose volume: 583 LCYSource of estimated volume: See attached drawing, "Pit 1 Highwall Reduction..."  
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**

Material weight:	<u>2,550 lbs/LCY</u>	Struck Volume:	<u>8.90</u>	LCY
Material description:	<u>Earth - Dry packed</u>	Heaped Volume:	<u>11.00</u>	LCY
Rated Payload:	<u>26,400 pounds</u>	Average Volume:	<u>9.95</u>	LCY
Payload Capacity:	<u>10.35 LCY</u>	Adjusted Capacity:	<u>9.95</u>	LCY

Cycle Time:Scraper Loading Time: 0.90 MinutesManeuver and Spread Time: 0.70 MinutesJob Condition Correction:

Site Altitude: 9730 feet

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

Travel Time:Road Condition: Rutted dirt, little maintenance, no water, 2" tire penetration 5.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1085.00	0.00	5.00	5.00	1228	0.96

Haul Time: 0.96 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	1085.00	0.00	5.00	5.00	1915	0.67

Return Time: 0.67 minutesTotal Scraper team cycle time: 3.23 minutesAdjusted for job conditions: 153.41 LCY/HourSelected Number of Scrapers: 1 Scraper(s)Adjusted single scraper team (unit) hourly production: 153.41 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 153.41 LCY/HourUnadjusted unit production/hour: 184.83 LCY/Hour

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

**JOB TIME AND COST**Fleet size: 1 Team(s) Total job time: 3.80 HoursUnit cost: \$1.716 /LCY Total job cost: \$1,001



**SCRAPER TEAM WORK**Task description: Pit 2 Topsoil ReplacementSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 005  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-005Agency or organization name: DRMS**HOURLY EQUIPMENT**COSTShift basis: 1 per day

Equipment Description	
-Scraper:	Cat 613C Series 2
-Dozer:	Cat D8T - 8U
Support Equipment -Load Area:	NA
-Dump Area:	NA
Road Maintenance -Motor Grader:	NA
-Water Truck:	NA

**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	NA	NA
Ownership cost/hour:	\$25.15	\$69.05	NA	NA	NA	NA
Operating cost/hour:	\$70.41	\$27.06	NA	NA	NA	NA
Ripper op. cost/hour:	NA	\$0.00	NA	NA	NA	NA
Operator cost/hour:	\$33.56	\$38.01	NA	NA	NA	NA
Unit Subtotals:	\$129.12	\$134.11	NA	NA	NA	NA
Number of Units:	1	1	0	0	0	0
Group Subtotals:	Work: \$263.23		Support:	\$0.00	Maint:	\$0.00

Total work team cost/hour: **\$263.23****MATERIAL QUANTITIES**Initial volume: 400 CCY  
Loose volume: 500 LCYSwell factor: 1.250Source of estimated volume: See attached drawing, "Pit 2 Assumed Highwall Reduction..."  
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION****Scraper Bowl (volume) Basis:**Material weight: 2,550 lbs/LCY  
Material description: Earth - Dry packed  
Rated Payload: 26,400 pounds  
Payload Capacity: 10.35 LCYStruck Volume: 8.90 LCY  
Heaped Volume: 11.00 LCY  
Average Volume: 9.95 LCY  
Adjusted Capacity: **9.95** LCY

Cycle Time:Scraper Loading Time: 0.90 MinutesManeuver and Spread Time: 0.70 MinutesJob Condition Correction:

Site Altitude: 9730 feet

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

Travel Time:Road Condition: Rutted dirt, little maintenance, no water, 1" tire penetration 4.0Haul Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	865.00	0.00	4.00	4.00	1528	0.69

Haul Time: 0.69 minutesReturn Route:

Seg #	Haul Distance (Ft)	Grade (%)	Roll. Res (%)	Total Res (%)	Velocity (fpm)	Travel Time (min)
1	865.00	0.00	4.00	4.00	2002	0.54

Return Time: 0.54 minutesTotal Scraper team cycle time: 2.83 minutesAdjusted for job conditions: 175.09 LCY/HourSelected Number of Scrapers: 1 Scraper(s)Adjusted single scraper team (unit) hourly production: 175.09 LCY/HourAdjusted multiple scraper team (fleet) hourly production: 175.09 LCY/HourUnadjusted unit production/hour: 210.95 LCY/Hour

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

**JOB TIME AND COST**Fleet size: 1 Team(s)Total job time: 2.86 HoursUnit cost: \$1.503 /LCYTotal job cost: \$752



**BULLDOZER WORK**Task description: Pit 3 Topsoil ReplacementSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 006  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-006Agency or organization name: DRMS**HOURLY EQUIPMENT COST**Basic Machine: Cat D8T - 8U  
Horsepower: 310  
Blade Type: Universal  
Attachment: 3-shank ripper  
Shift Basis: 1 per day  
Data Source: (CRG)**Cost Breakdown:**

		<u>Utilization %</u>
Ownership Cost/Hour:	\$69.05	NA
Operating Cost/Hour:	\$108.22	100
Ripper op. Cost/Hour:	\$0.00	0
Operator Cost/Hour:	\$38.01	NA

Total unit Cost/Hour: \$215.28  
Total Fleet Cost/Hour: \$215.28**MATERIAL QUANTITIES**Initial Volume: 1,333  
Swell factor: 1.250  
Loose volume: 1,667 LCYSource of estimated volume: (360' x 200' x 0.5'D) / 27 = 1333.33 cy  
Source of estimated swell factor: Cat Handbook**HOURLY PRODUCTION**Average push distance: 80 feet  
Unadjusted hourly production: 1,110.8 LCY/hrMaterials consistency description: Consolidated stockpile 1.0Average push gradient: 0 %  
Average site altitude: 9,730 feetMaterial weight: 2,550 lbs/LCYWeight description: Earth - Dry packed**Job Condition Correction Factor**

		<u>Source</u>
Operator Skill:	0.750	(AVG.)
Material consistency:	1.000	(CAT HB)
Dozing method:	1.000	(GEN.)
Visibility:	1.000	(AVG.)

Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	0.800	(FND-RF)
Push gradient:	1.000	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.902	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4492

Adjusted unit production: 498.97 LCY/hr  
Adjusted fleet production: 498.97 LCY/hr

### **JOB TIME AND COST**

Fleet size: 1 Dozer(s)  
Unit cost: \$0.431/LCY

Total job time: 3.34 Hours  
Total job cost: \$719



**REVEGETATION WORK**Task description: Revegetate 2.7 Acres Affected LandSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 007  
Date: 10/15/2014  
User: WHEState: Colorado  
County: San JuanAbbreviation: None  
Filename: M065-007Agency or organization name: DRMS**FERTILIZING****Materials**

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
0-20-20, 4-8-12, 10-10-10	40.00	pound	\$0.21	\$8.44
			<b>Total Fertilizer Materials Cost/Acre</b>	<b>\$8.44</b>

**Application**

Description	Cost /Acre
Tractor towed spreader (MEANS 32 01 90.13 0120)	\$52.71
<b>Total Fertilizer Application Cost/Acre</b>	<b>\$52.71</b>

**TILLING**

Description	Cost /Acre
Chisel plowing {DMG}	\$88.58
<b>Total Tilling Cost/Acre</b>	<b>\$88.58</b>

**SEEDING**

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Orchardgrass - Paiute	0.80	9.92	\$1.73
Mountain Brome - Bromar	3.80	6.11	\$12.92
Red Clover - Medium	0.40	2.48	\$0.74
Western Wheatgrass - Native	3.20	8.08	\$9.73
Timothy, Alpine - Native	0.40	11.94	\$10.83
Penstemon, Rocky Mountain	0.10	1.57	\$3.37
<b>Totals Seed Mix</b>	<b>8.70</b>	<b>40.09</b>	<b>\$39.32</b>

**Application**

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Description	Cost /Acre
Drill seeding (DRMS Cost Data)	\$88.20
Total Seed Application Cost/Acre	\$88.20

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

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	\$265.00	\$530.00
Total Mulch Materials Cost/Acre				\$530.00

**Application**

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	\$65.89
Power mulcher (MEANS 32 91 13.16 0250)	\$86.68
Total Mulch Application Cost/Acre	\$152.57

**NURSERY STOCK PLANTING**

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

**JOB TIME AND COST**

No. of Acres:	2.7	Cost /Acre:	\$959.82
Estimated Failure Rate:	25%	Cost /Acre*:	\$959.82
*Selected Replanting Work Items:	FERTILIZING,TILLING,SEEDING,MU LCHING		
Initial Job Cost:	\$2,591.51		
Reseeding Job Cost:	\$647.88		
Total Job Cost:	\$3,239		
Job Hours:	0.00		



**EQUIPMENT MOBILIZATION/DEMobilIZATION**Task description: Haul reclamation equipment to and from job siteSite: Upper Animas Sand and  
Gravel PitPermit Action: SR-01Permit/Job#: M2005065**PROJECT IDENTIFICATION**Task #: 008State: ColoradoAbbreviation: NoneDate: 10/15/2014County: San JuanFilename: M065-008User: WHEAgency 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:**

<b>Available Rig Capacities</b>	<b>0-25 Tons</b>	<b>26-50 Tons</b>	<b>51+ Tons</b>
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 D8T - 8U	53.70	\$69.05	\$125.45	1	\$194.50	\$125.45	\$250.00
Cat 613C Series 2	18.61	\$25.15	\$88.67	1	\$113.82	\$88.67	\$250.00
Drill/Broadcast Seeder with Tractor	25.00	\$39.59	\$88.67	2	\$256.51	\$177.34	\$500.00
Power Mulcher (Reinco M90)	6.00	\$7.03	\$88.67	2	\$191.40	\$177.34	\$500.00

Subtotals: **\$756.23** **\$568.80** **\$1,500.00****ROADABLE EQUIPMENT:**

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Light Duty Pickup, 4x4, 3/4 T.	\$15.30	1	\$15.30	\$15.30

Subtotals: **\$15.30** **\$15.30**

**EQUIPMENT HAUL DISTANCE and Time**

Nearest Major City or Town within project area region:	<u>DURANGO</u>	
Total one-way travel distance:	<u>60.00</u>	miles
Average Travel Speed:	<u>50.00</u>	mph

Total Non-Roadable Mob/Demob Cost *	<u>\$7,692.53</u>
** two round trips with haul rig:	
Total Roadable Mob/Demob Cost **	<u>\$36.72</u>
** one round trip, no haul rig:	

**Transportation Cycle Time:**

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	1.20	1.20
Return Time (Hours):	1.20	1.20
Loading Time (Hours):	0.50	NA
Unloading Time (Hours):	0.50	NA
Subtotals:	3.40	2.40

**JOB TIME AND COST**

Total job time:	<u>6.80</u>	Hours
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Total job cost:	<u>\$7,729</u>
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