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.

MINE NAME: Two Rivers	**MINE/PROSPECTING ID#:** M-1998-038	**MINERAL:** Gravel	**COUNTY:** Pueblo
INSPECTION TYPE: Monitoring	**WEATHER:** Clear	**INSP. DATE:** March 28, 2023	**INSP. TIME:** 09:15
OPERATOR: Kirkland Construction, R.L.L.P.	**OPERATOR REPRESENTATIVE:** Mike Ausmus	**TYPE OF OPERATION:** 112c - Construction Regular Operation	

REASON FOR INSPECTION: Surety Related	**BOND CALCULATION TYPE:** Complete Bond	**BOND AMOUNT:** No Bond Held
DATE OF COMPLAINT: NA	**POST INSP. CONTACTS:** None	**JOINT INSP. AGENCY:** None
INSPECTOR(S): Amber Michels	**INSPECTOR'S SIGNATURE:** Amber Michels	**SIGNATURE DATE:** April 19, 2023

The following inspection topics were identified as having Problems or Possible Violations. OPERATORS SHOULD READ THE FOLLOWING PAGES CAREFULLY IN ORDER TO ASSURE COMPLIANCE WITH THE TERMS OF THE PERMIT AND APPLICABLE RULES AND REGULATIONS. If a Possible Violation is indicated, you will be notified under separate cover as to when the Mined Land Reclamation Board will consider possible enforcement action.

INSPECTION TOPIC: Gen. Compliance With Mine Plan

PROBLEM: There are highwalls present in both the Phase 2 and Phase 3 areas of the site. The currently approved mining plan does not allow for the existence of highwalls. Also, the current mine plan allows for 99 acres to be affected at one time. The Division estimates that approximately 112 acres (excluding the access road) are currently affected. The current mine plan needs to be updated and clarified pursuant to C.R.S. 34-32.5-112(1)(c)(VI). The Operator must provide sufficient information to describe or identify how the Operator intends to conduct the operation.

CORRECTIVE ACTIONS: The Operator shall submit a Technical Revision, with the required $216 revision fee, to update and clarify the current approved mine plan to reflect existing and proposed activities by the corrective action date.

CORRECTIVE ACTION DUE DATE: 5/19/23

INSPECTION TOPIC: Off-site Damage

PROBLEM: The Operator has affected land within a defined 200 foot buffer zone area without prior approval. This is a problem at this time pursuant to C.R.S. 34-32.5-116(4)(i) for failure to protect areas outside of the affected land from slides or damages occurring during the mining operation.
CORRECTIVE ACTIONS: The current Operator or the prospective Successor will be required to back-fill the highwalls that currently exist in the off-site area to the original elevation. Additionally, the current Operator or prospective Successor will be responsible for spreading and seeding topsoil over the 200 foot buffer area that was affected by mining. The current Operator or prospective Successor will have 60 days from the date of this letter to bring this area in compliance. Or, the Operator shall submit a technical revision to revise the buffer zone area as discussed in the body of the report by the corrective action date.
CORRECTIVE ACTION DUE DATE: 6/19/23

INSPECTION TOPIC: Other

PROBLEM: An unknown substance was observed in the Phase 2 area. It is unclear how the Operator will handle this material in accordance with Rule 3.1.5.
CORRECTIVE ACTIONS: Please provide a written explanation explaining what this material is, how it is used, why it is stored onsite, and how it will be disposed of by the corrective action date.
CORRECTIVE ACTION DUE DATE: 5/19/23

INSPECTION TOPIC: Signs & Markers

PROBLEM: Affected area boundary markers were not observed per the requirements of Rule 3.1.12.
CORRECTIVE ACTIONS: The boundaries of the affected area must be marked by monuments or other markers that are clearly visible and adequate to delineate such boundaries.
CORRECTIVE ACTION DUE DATE: 5/19/23

INSPECTION TOPIC: Topsoil

PROBLEM: The topsoil pile is located in an area not approved to be affected by mining. Additionally, the topsoil stockpile does not have established vegetation on it and is therefore susceptible to erosion and appears to have been affected by the mining operation. This is a problem for failure to protect the topsoil stockpile from erosion in accordance with Rule 3.1.9(1). Also, this is a problem for failure to minimize disturbance to the stockpiled topsoil from the mining operation in accordance with Rule 3.1.9(3)
CORRECTIVE ACTIONS: The Operator shall relocate the stockpile into an area approved for mining and in a location that it will be unaffected by ongoing mining operations, or revise the approved mining plan to reflect the storage of topsoil at this location. Once relocated or repaired, the Operator shall seed the stockpile with the seed mix that was submitted as part of the approved Reclamation Plan. The Operator shall demonstrate compliance by submitting seed tags, a bill of sale or photographs of seeding activities.
CORRECTIVE ACTION DUE DATE: 5/19/23

OBSERVATIONS

The Two Rivers Pit was inspected by Amber Michels with the Division of Reclamation, Mining and Safety (Division/DRMS). This inspection is part one of two, and was completed in response to a Succession of Operators application (Revision No. SO1) that was received by the Division on February 13, 2023. The site was previously inspected by the Division on January 17, 2020 as part of the Division's routine monitoring program. Mike Ausmus of Fremont Paving & Redi Mix, Inc. represented the prospective Successor Operator, and accompanied me during the inspection. The weather was clear and cool.

The Two Rivers Pit is located in Pueblo County approximately 5.5 miles east of Avondale, Colorado. The Two Rivers Pit is a 339-acre 112c Construction Materials Reclamation Permit with a maximum allowed disturbance of 99 acres. The primary commodities being mined at the site are sand and gravel. The 112c Construction Materials Reclamation Permit was issued in July 1998. The 112c Two Rivers Pit was permitted over the area previously permitted by a 111 permit. The approved post-mining land use is rangeland. The mine site was surrounded by the following land uses: residential, agricultural, and rangeland.

Financial Warranty:

The Division calculated an updated reclamation cost estimate based on the currently approved reclamation plan and observations made at the inspection. The Division estimates $481,376 as a required bond. The Division currently holds a $371,968 in the form of corporate sureties yielding a deficit of $109,408. Prior to the approval of the Succession of Operators application, the prospective Successor will be required to submit a financial warranty reflective of the updated cost estimate. The Division will issue a required surety increase in accordance with Rule 4.2.1(2). The prospective Successor will need to post the required surety reflecting this increase within 60 days of this notice and prior to the approval of the SO1 application. Otherwise, the current permittee will need to post the additional required surety.

Gen. Compliance With Mine Plan:

A problem was cited above for the existence of highwalls and for affecting a greater acreage of land than is currently allowed for in the approved mine plan. During the inspection, the Division determined the extent of the highwalls to be about 4,376 ft in length (see Map 1), and estimated the maximum highwall height to be about 20 feet (see Photo 20). The currently approved mine plan states that mining will occur at a 3H:1V slope and will not create any highwalls. During the most recent inspection (January 2020), the Division required the highwalls observed to be graded to a 3H:1V slope as required by the mine plan. The Operator had submitted photo evidence to the Division indicating compliance, and those highwalls were returned to 3H:1V slopes. However, the highwalls observed during the March 2023 inspection were located more central to the site and further west of the site than those observed previously (see Maps 1 and 2). The highwalls again need to be returned to a 3H:1V slope, or a revision to the permit via Technical Revision or Amendment will need to be submitted to

update the mining plan to include the use of highwalls.

During the 2020 inspection, approximately 104 acres were disturbed, with about 37 acres entering final reclamation. At the time of the last inspection, the Operator intended to enter the pit into final reclamation. However, the plan changed and active mining resumed. The Division now estimates that about 112 acres are currently affected (excluding the access road), and new land has been disturbed in a portion of the area previously eligible for release (see Maps 1 and 2). There are still some reclaimed areas that may be eligible for release (see Photo 22 and Marker 3 on Map 1). The Operator or prospective Successor may wish to apply for an Acreage Release to allow the alignment of the affected land with the currently approved maximum affected acreage of 99 acres. Alternatively, the Operator or prospective Successor may wish to submit a Technical Revision to allow for additional maximum affected acreage. Either way, until the affected land is released from bond and/or reclamation liability, adequate surety must be held by the Division to complete reclamation of the site.

Off-site Damage:
A problem was cited above for affecting land outside of the approved affected land boundaries. According to the current mining plan, a 200 foot buffer of unaffected land must be maintained between the approved affected acreage and the permit boundary on the majority of the site's borders (see Map 3). However, according to the Division's estimate of the permit boundary, the mining activity in Phase 3 has affected approximately 2.37 acres of land within this 200 foot buffer zone (see Map 5). Within 60 days of this letter, the current Operator or prospective Successor will be required to backfill and reclaim the area within the 200' buffer, and establishing a marked boundary. Or, the Operator may submit a technical revision to revise the buffer zone for the area in question and supply structure damage agreements for the structures within 200 feet of the affected land, or if such an agreement cannot be reached, an engineering evaluation that demonstrates such structures will not be damaged by the mining operation in accordance with Rule 6.4.19.

Other:
A problem was stated above pertaining to a containment area consisting of fine grey material observed in the Phase 2 area (see Photo 23 and Marker 4 in Map 1). When asked about this, the prospective Successor said that they believe this to be 'salt-fines' or 'salt-sand' used in combination with mining product for the use in CDOT projects. The prospective Successor will be required to adhere to the corrective actions requirements listed in the problem above prior to the corrective actions deadline.

Roads:
The entrance/access road that is to remain after reclamation appears to be well maintained.

Right of Entry:
The prospective Successor has sought to purchase the parcels of land that encompass the entirety of the permit. There is a discrepancy among the Division's permit boundary estimates, the prospective Successor's permit boundary estimates, and the parcel boundary information

on the Pueblo County Assessor's website. To alleviate these discrepancies, the prospective Successor has committed to having the land surveyed, to verify the approved permit boundary, and submitting an Amendment to the permit to define the approved location and acreage of the site.

Revegetation:
The area to the north-east of the entrance road, and to the north of the Phase 2 area seems to have established stable vegetative cover (see Photo 24 and marker 3 on Map 1).

Signs and Markers:
A problem was stated above for the absence of affected land permit boundary markers. The prospective Successor stated that upon approval, they intend to define both the permit boundary and the affected boundary with monuments.

Topsoil:
A problem was cited above due to improper topsoil placement, stabilization, and damage. The topsoil pile was identified along the western edge of the highwall in Phase 3. Sparse vegetation has established on the stockpile and it appears the topsoil stockpile has been damaged (see Photos 16-19, 21, and marker 2 on Map 1). Tthe topsoil pile is directly above the northern-most highwall in the Phase 3 area. Additionally, the topsoil pile is almost entirely placed within the 200' buffer area that needs to be backfilled and reclaimed. Because the topsoil pile will need to be re-located, and because of its proximity to mining operations, this problem is cited for failure to comply with Rule 3.1.9(3). Pursuant to Rule 3.1.9(3) topsoil must be stockpiled in places and configurations to minimize erosion and located in areas where disturbance by ongoing mining operations will be minimized. Once the topsoil pile is in a new location within the approved affected boundary, and is placed separately from on-going mining activities, pursuant to Rule 3.1.9(1), the pile will need to be seeded/re-seeded. The Operator shall submit evidence to the Division that the topsoil pile has been re-located and stabilized prior to the corrective actions date. Or, the Operator may submit a technical revision revising the mining plan to allow the stockpiling of topsoil in this location to comply with the applicable requirements of Rule 3.1.9 and Rule 6.4.19 as discussed above.

This is the only topsoil stockpile known to the representative of the prospective Successor at this time. The Division recommends that the prospective Successor identifies the intended locations of the future stockpiles on the Amendment maps when they are submitted and ensures that enough topsoil will be salvaged for use in reclamation.

This concludes the Division's Inspection Report; a few maps displaying topics discussed during the inspection and a subset of photographs that were taken during the time of the inspection are included below. If you need additional information or have any questions, please contact me by email at amber.michels@state.co.us or by telephone at (720) 836-0967.

Inspection Contact Address
Mike Ausmus

839 Mackenzie Ave.
Canon City, CO
81215

Enclosure: DRMS Updated Cost Estimate

CC: John P. Ary, Fremont Paving & Redi Mix, Inc.
Jodi Schreiber, Fremont Paving & Redi Mix, Inc.
James H. Kirkland, Kirkland Construction, R.L.L.P

GENERAL INSPECTION TOPICS

The following list identifies the environmental and permit parameters inspected and gives a categorical evaluation of each

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

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

PHOTOGRAPHS

Photo 1: Looking north-west at the mine sign posted to the left of the site entrance road. *Marker 1 on Map 1.*

Photo 2: Looking east at the entrance gate leading to the access road for the site.

Photo 3: Looking east at the end of the access road at the scale and scale house.

Photo 4: Looking south-east from the access road at the water tank onsite.

Photo 5: Looking north from access road at the mining activity in the Phase 3 portion of the site.

Photo 6: Looking north-west at active pit in the Phase 3 area of the site.

Photo 7: Looking north-west at the highwall in Phase 3.

Photo 8: Looking east across the pit towards the stockpile and processing area.

Photo 9: Looking west across the western boundary of Phase 3 at the highwall.

Photo 10: Looking north-west at western boundary of the Phase 3 highwall from pit entrance.

Photo 11: Looking north-west along western highwall in the Phase 3 area.

Photo 12: Looking east across Phase 3 area at product stockpiles.

Photo 13: Standing on top of the west highwall in Phase 3, looking south toward the southern portion of the Phase 3 highwall.

Photo 14: Standing on top of the west highwall in Phase 3, looking north toward the northern portion of the Phase 3 highwall.

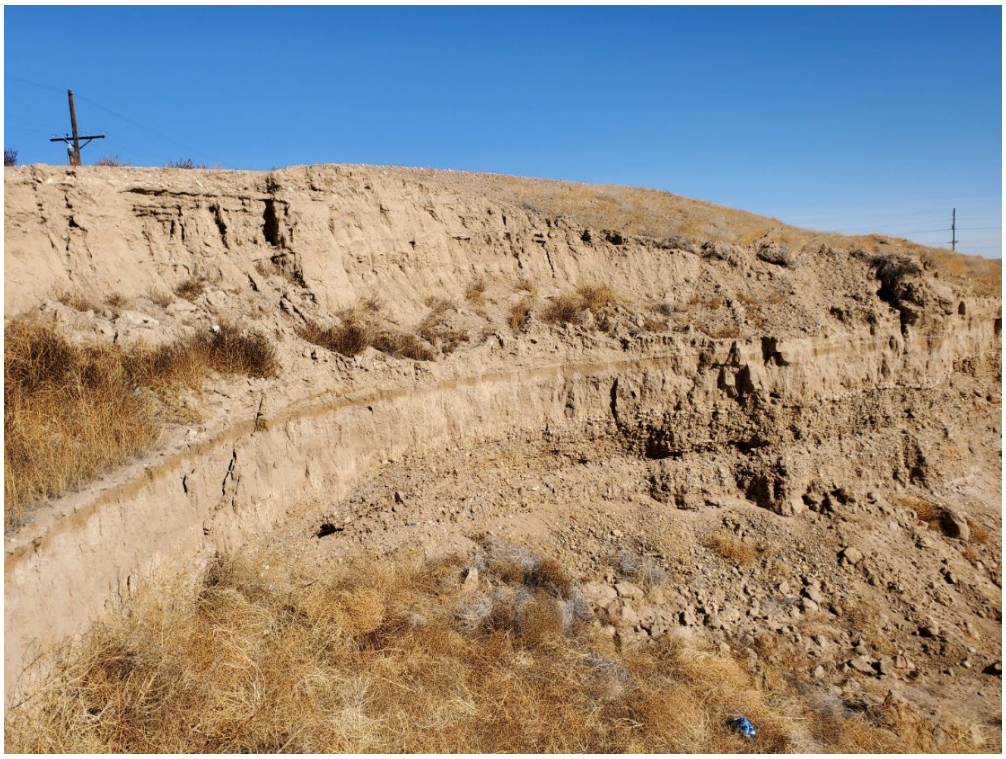


Photo 15: Looking north toward the northern portion of the Phase 3 highwall from the top of the highwall.

Photo 16: Looking east at the topsoil pile on site. This is located along the northern edge of the Phase 3 pit area. The area circled in the photo indicates where the topsoil pile has sustained damage from mining activities.

Photo 17: Binder (11.5” x 10”) for scale. Topsoil pile.

Photo 18: Looking east at the topsoil pile on site. This is located along the northern edge of the Phase 3 pit area. Binder (11.5” x 10”) for scale. *Marker 2 on Map 1.*

Photo 19: Looking east at the topsoil pile on site. This is located along the northern edge of the Phase 3 pit area. Binder (11.5” x 10”) for scale.

Photo 20: Looking West at maximum highwall height. Binder (11.5” x 10”) for scale. Highwall is approximately 20’ tall.

Photo 21: Looking at north-west corner of the Phase 3 pit. The arrow points to the topsoil pile.

Photo 22: Reclaimed area, the vegetation resembles that of the adjacent un-affected areas. *Marker 3 on Map 1.*

Photo 23: Looking south-west at 'salt-fines' or 'salt-sand' used to combine with product for CDOT project (according to Mr. Ausmus). Contained onsite in with cement berms encasing three sides of the pile located in the Phase 2 area. *Marker 4 on Map 1.*

Photo 24: Looking east across the Phase 2 area of the site at the eastern side of the northern-most Phase 2 highwall.

Photo 25: Looking north-east across the Phase 2 are of the site at the northern side of the northern-most Phase 2 highwall.

Photo 26: Looking north-east at the eastern edge of the northern highwall from the top of the middle highwall in the Phase 2 area.

Photo 27: Looking east across the top of the southern-most highwall in Phase 2.

Photo 28: Looking north at the northern and eastern edges of the northern-most highwall in Phase 2.

Photo 29: Looking west across the southern-most highwall in the Phase 2 area.

Photo 30: On top of the southern-most highwall in the Phase 2 area, looking at an erosional feature in the highwall.

Photo 31: Looking east across the top of the southern-most highwall in Phase 2.

Photo 32: Looking south-west from the pit floor at the southern-most highwall in Phase 2.

Photo 33: Looking north at the southern-most highwall in the Phase 2 area, and at some product stockpiles.

Photo 34: Looking north across the Phase 2 pit from the top of the northern-most highwall's western edge.

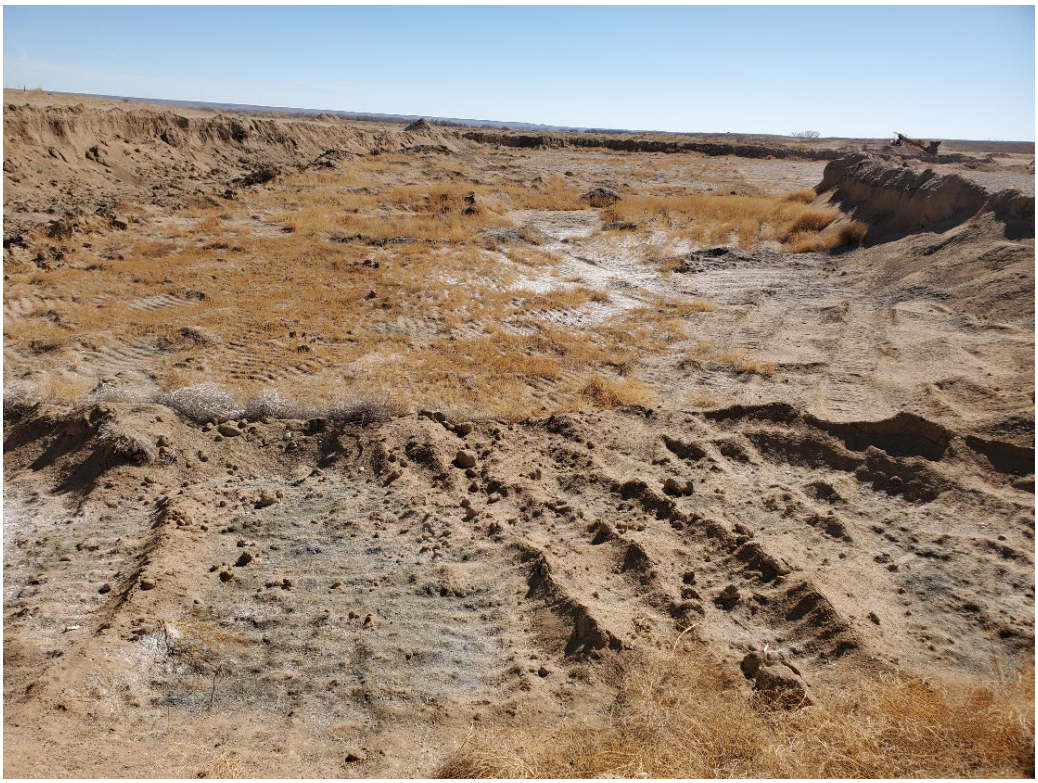
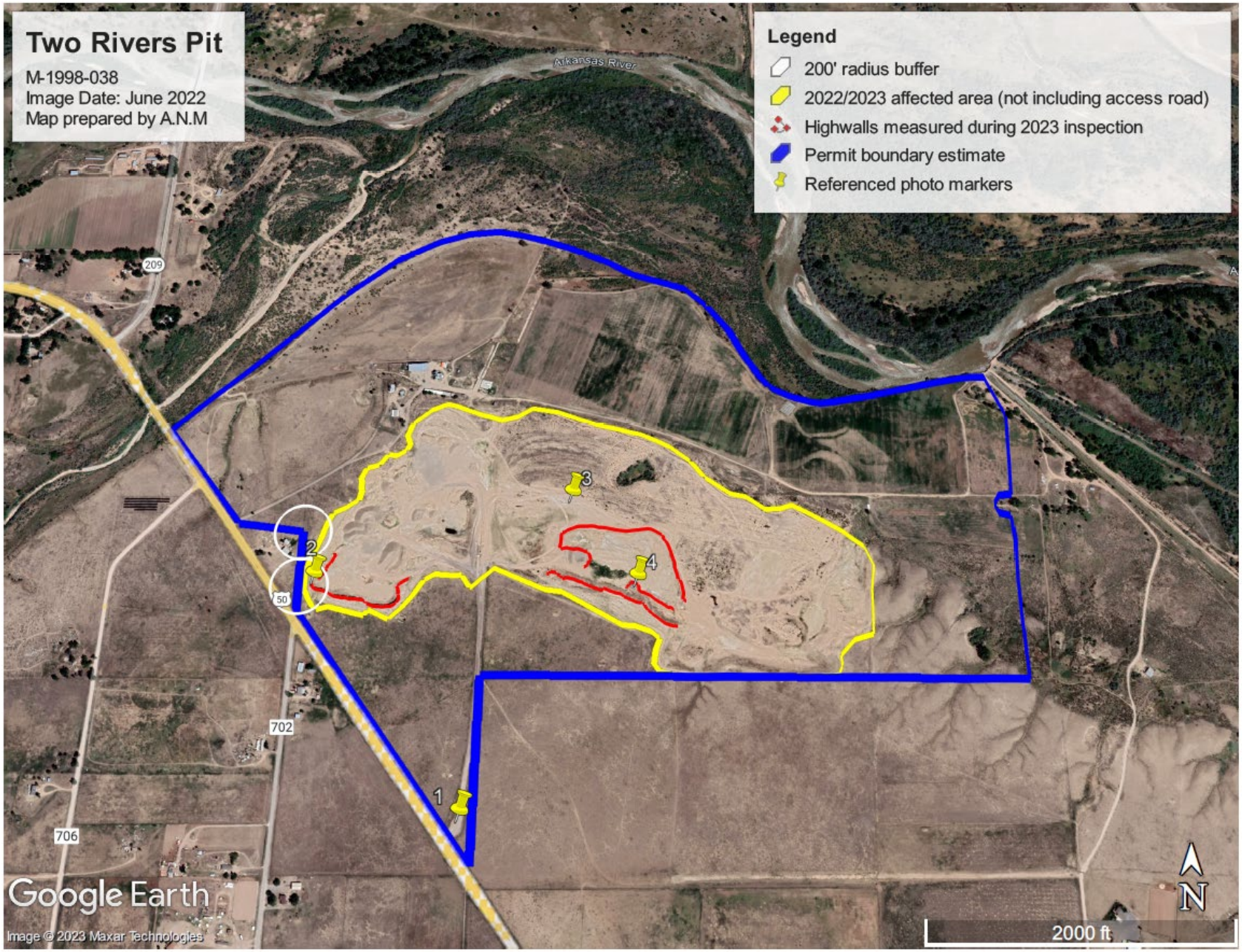


Photo 35: Looking east across the Phase 2 pit from the top of the northern-most highwall's western edge.

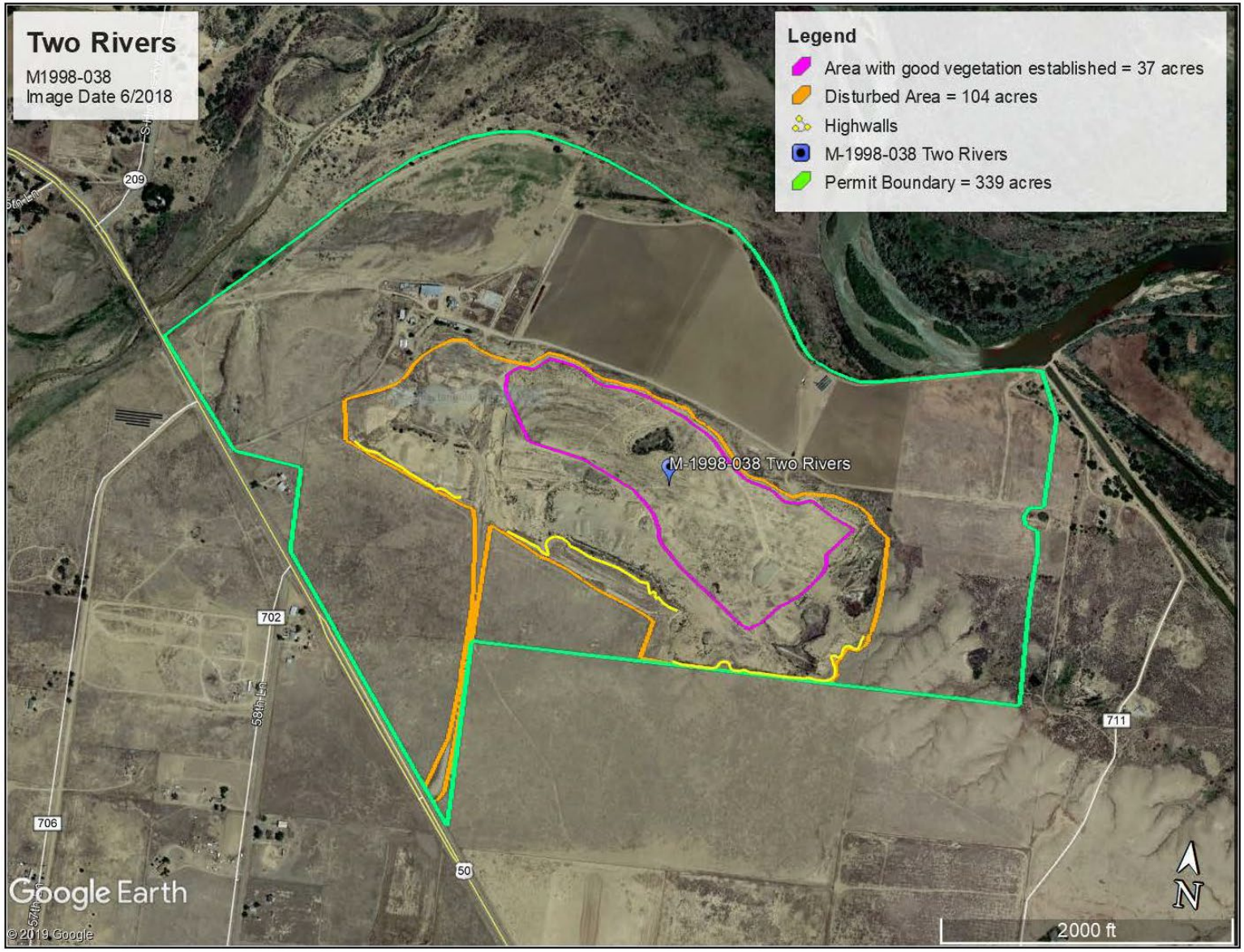
Photo 36: Looking south across the Phase 2 pit and at product stockpiles from the top of the northern-most highwall's western edge.

Photo 37: Looking east across the southern-most highwall in the Phase 2 area at excess material that may help with backfilling the highwalls.

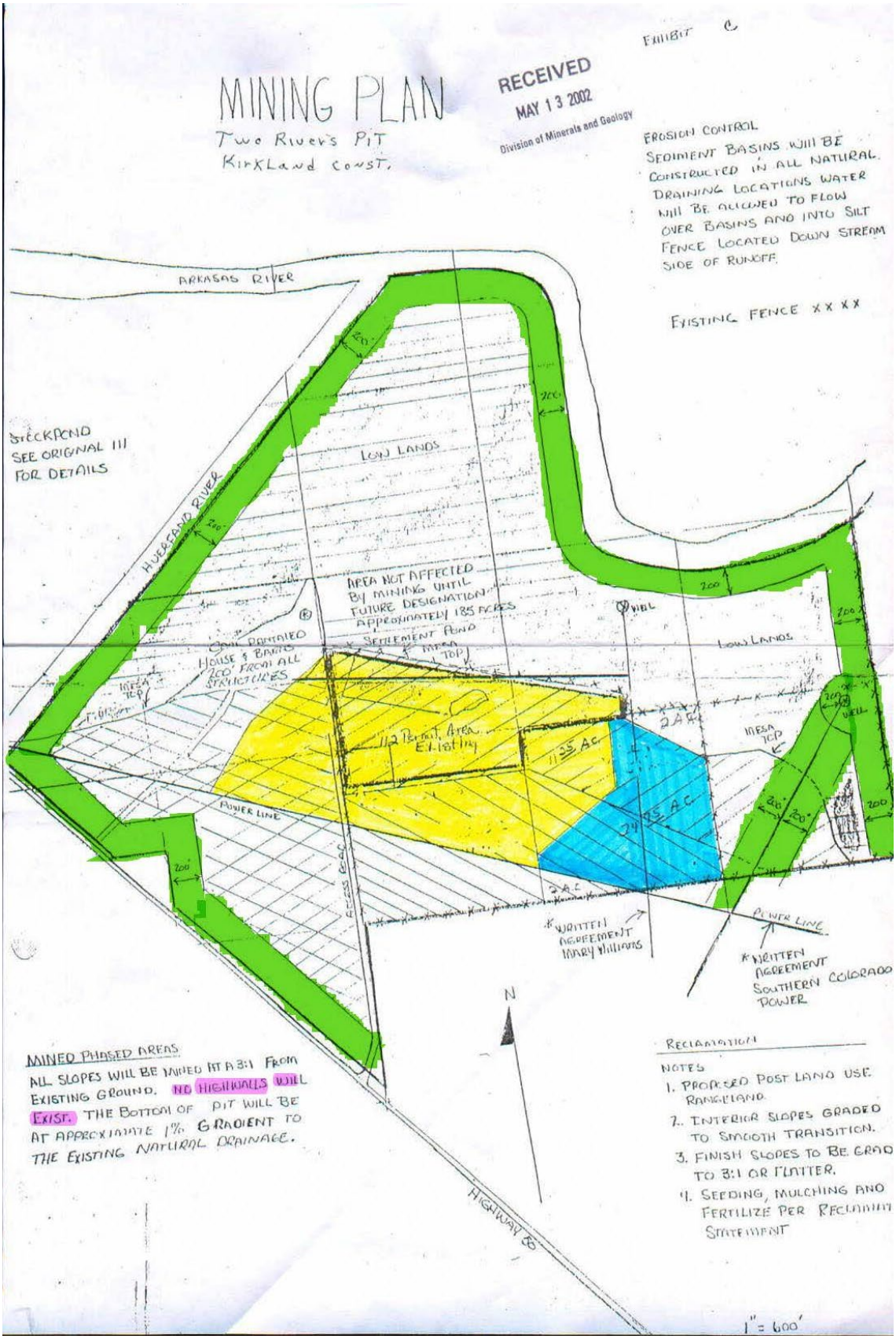
Photo 38: Looking north-west across the Phase 2 pit from the pit floor.



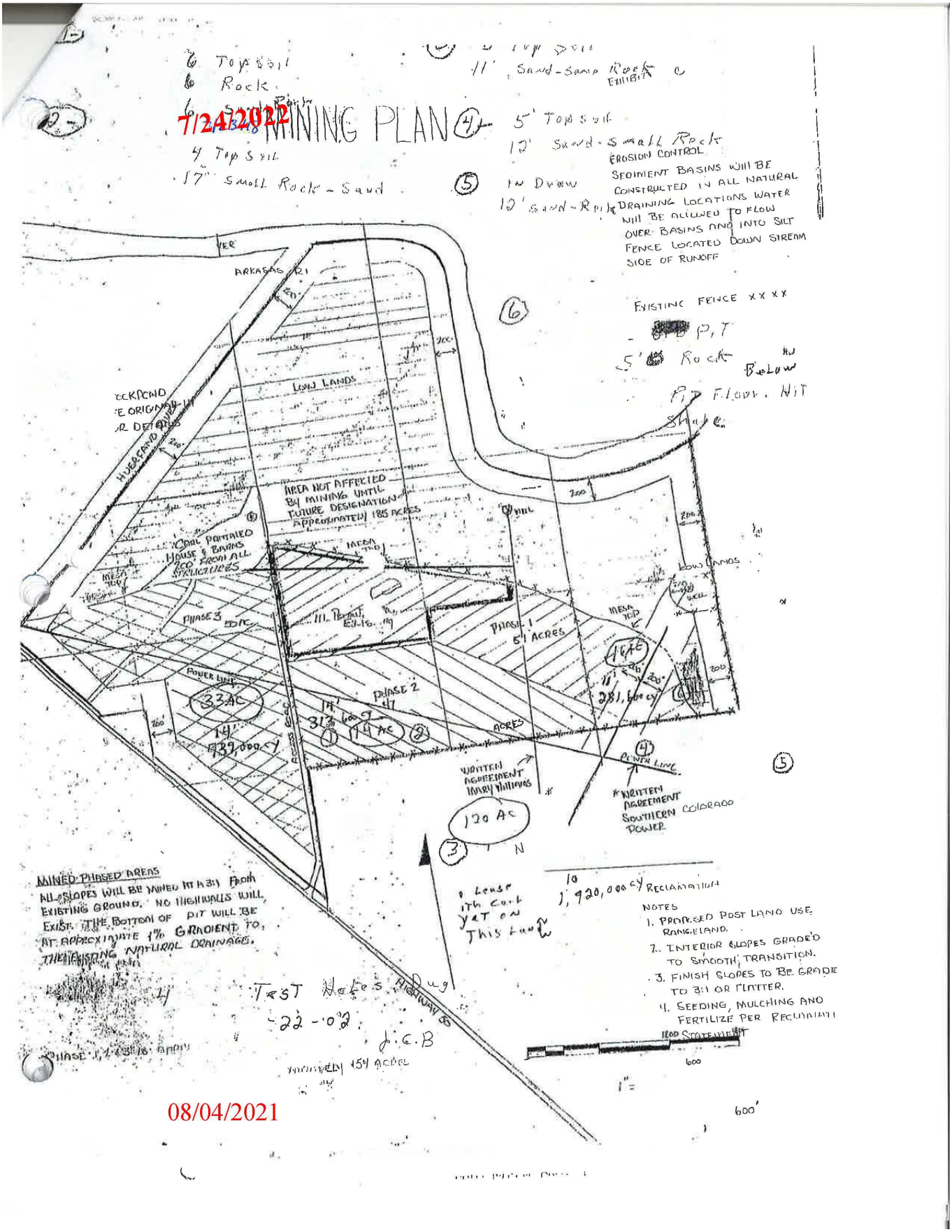
Map 1: Map generated in Google Earth Pro. Map shows the Division's estimated permit boundary, the 200' radius affected land buffer with disturbance in it on the west side of the Phase 3 permit area, the highwalls measured during the March 2023 inspection, pins indicating photo references, and the approximate currently affected acreage (excluding the access road).



Map 2: Map generated in Google Earth Pro from the Division's January 2020 Inspection Report. The highwalls identified above differ from those observed during the March 2023 inspection. Portions of the area described as having good vegetation (see pink polygon above) have been disturbed through recent mining activities (see Map 1).



Map 3: Map edited from the currently approved mining plan map from Technical Revision No. 5 (TR5). The Division's edits include the green and pink highlighted areas. Highlighted in green is a 200' buffer around the majority of the permit boundary, and around the water line from Gary Fillmore's well. Highlighted in pink is a statement that indicates that highwalls are not part of the mining plan.

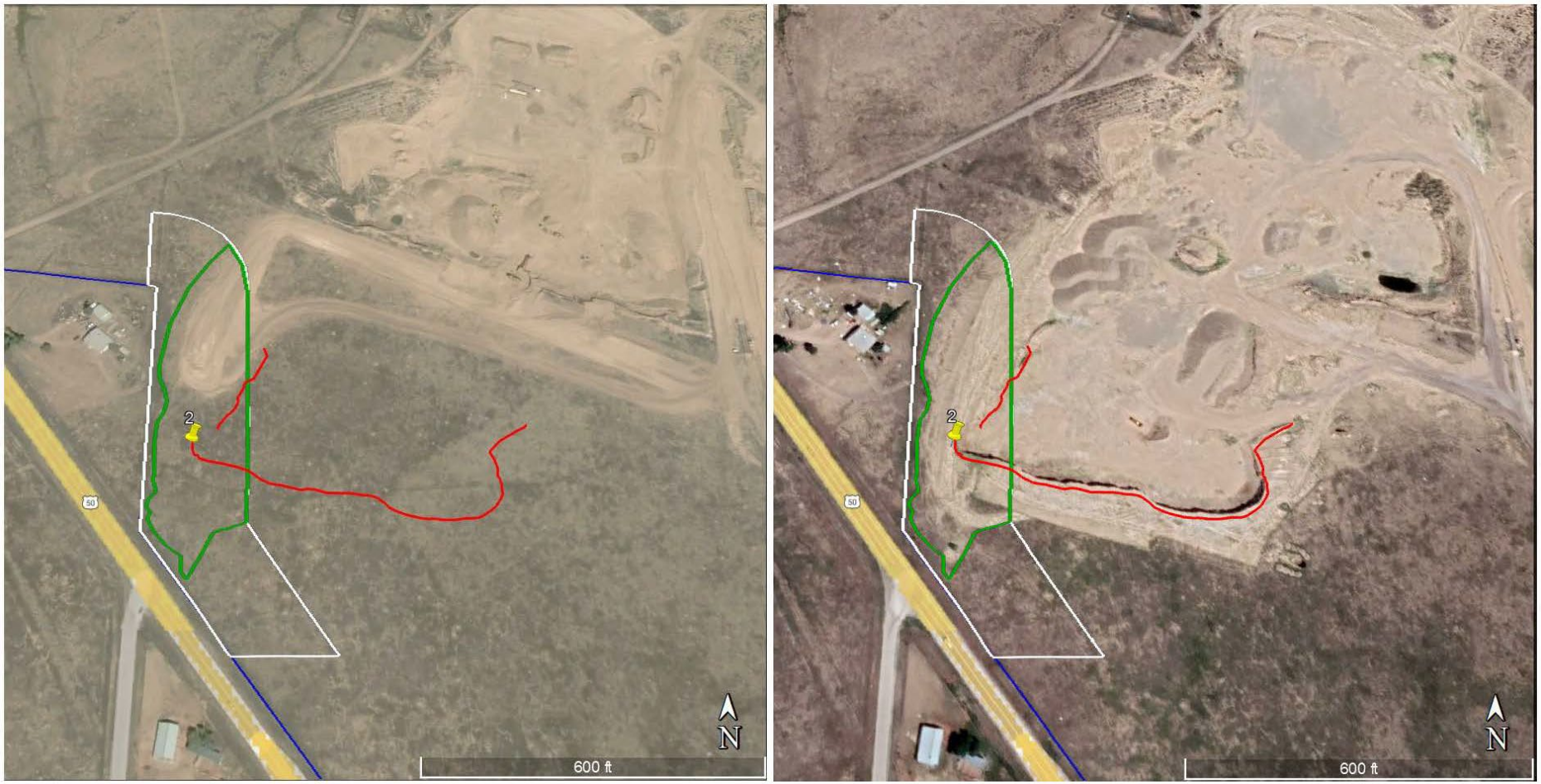


Map 4: 2022 annual report map showing reported affected acreages and current Phasing areas for reference.

Two Rivers Pit

M-1998-038

Acreage affected within the 200' buffer zone in 2020 and 2022



Map 5: Images taken from Google Earth Pro. The white polygon represents a roughly representation of the approved 200’ buffer zone in the currently approved mining plan. The google earth image on the left was taken in September 2020, and it represents the first record of the Operator affecting land within the 200’ buffer zone. The image on the right, taken in June 2022, is the most recent Google Earth image available showing the extent of the land affected by mining within the 200’ buffer zone. The surface area within the green polygon measures 2.37 acres and approximates the acreage within the 200’ zone affected by mining as of 2022. **Red lines are the highwalls measured during the 2023 inspection, the blue line is the Division’s permit boundary estimate, the push pin represents the south-west face of the topsoil pile in Photo 18.*

COST SUMMARY WORK

Task description: **Two Rivers Pit DRMS Reclamation Cost Estimate**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 000 State: Colorado Abbreviation: None
Date: 4/11/2023 County: Pueblo Filename: M038-000
User: ANM

Agency or organization name: DRMS

TASK LIST (DIRECT COSTS)

Task	Description	Form Used	Fleet Size	Task Hours	Cost
001	Grade Highwalls to 3H:1V Pushdown	DOZER	1	52.57	$11,697
002	Reclaim Highwall in the 200' buffer zone	LOADER	2	60.84	$14,603
003	Spread 6 inches of topsoil over 99 acres	SCRAPER1	1	62.12	$136,975
004	Revegetation of 99 acres	REVEGE	1	99.00	$186,464
005	Mob	MOBILIZE	1	8.88	$22,340
		SUBTOTALS:		**283.41**	**$372,079**

INDIRECT COSTS

OVERHEAD AND PROFIT:

Liability insurance:	2.02	Total =	$7,516
Performance bond:	1.05	Total =	$3,907
Job superintendent:	141.71	Total =	$10,646
Profit:	10.00	Total =	$37,208
		TOTAL O & P =	$59,277
		CONTRACT AMOUNT (direct + O & P) =	$431,356

LEGAL - ENGINEERING - PROJECT MANAGEMENT:

Financial warranty processing (legal/related costs):	$500	Total =	$500
Engineering work and/or contract/bid preparation:	6.59	Total =	$28,426
Reclamation management and/or administration:	4.89		$21,093
CONTINGENCY:	0.00	Total =	$0
		TOTAL INDIRECT COST =	$109,297
		TOTAL BOND AMOUNT (direct + indirect) =	**$481,376**

BULLDOZER WORK

Task description: **Grade Highwalls to 3H:1V Pushdown**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 001 State: Colorado Abbreviation: None
Date: 4/11/2023 County: Pueblo Filename: M038-001
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT COST

Basic Machine: Cat D7R DS XR Series II
Horsepower: 240
Blade Type: Semi-Universal
Attachment: 3-shank ripper
Shift Basis: 1 per day
Data Source: (CRG)

Cost Breakdown:

		Utilization %
Ownership Cost/Hour:	$92.78	NA
Operating Cost/Hour:	$79.33	100
Ripper own. Cost/Hour:	$8.37	NA
Ripper op. Cost/Hour:	$2.00	40
Operator Cost/Hour:	$40.04	NA

Total unit Cost/Hour: $222.51
Total Fleet Cost/Hour: **$222.51**

MATERIAL QUANTITIES

Initial Volume: 16,008
Swell factor: 1.430
Loose volume: **22,891** LCY

Source of estimated volume: 4098ft msrd HW,(ex. 200' area) 20' estimated max hw height
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Average push distance: 50 feet
Unadjusted hourly production: 1,022.9 LCY/hr

Materials consistency description: Rock, well ripped or blasted 0.8

Average push gradient: -5 %
Average site altitude: 4,500 feet

Material weight: 3,300 lbs/LCY

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

Job Condition Correction Factor		Source
Operator Skill:	0.750	(AVG.)
Material consistency:	0.800	(CAT HB)
Dozing method:	1.100	(50% SL)
Visibility:	1.000	(AVG.)
Job efficiency:	0.830	(1 SHIFT/DAY)
Spoil pile:	1.000	(DOZ-OC)
Push gradient:	1.115	(CAT HB)
Altitude:	1.000	(CAT HB)
Material Weight:	0.697	(CAT HB)
Blade type:	1.000	(PAT)

Net correction: 0.4257

Adjusted unit production: 435.45 LCY/hr

Adjusted fleet production: **435.45** LCY/hr

JOB TIME AND COST

Fleet size: 1 Dozer(s)

Unit cost: $0.511/LCY

Total job time: **52.57** Hours

Total job cost: **$11,697**

WHEEL LOADER – LOAD AND CARRY WORK

Task description: **Reclaim Highwall in the 200' buffer zone**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 002 State: Colorado Abbreviation: None
Date: 4/17/2023 County: Pueblo Filename: M038-002
User: ANM

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:	$46.76	NA
Operating Cost/Hour:	$37.28	100
Operator Cost/Hour:	$35.97	NA
Total Unit Cost/Hour:	$120.01	
Total Fleet Cost/Hour:	$240.02	

MATERIAL QUANTITIES

Initial volume: 19,000 CCY Swell factor: 1.250
Loose volume: **23,750** LCY

Source of estimated volume: Division of Reclamation, Mining & Safety
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:	Bank or broken material 0.04	0.040	(Cat HB)
Stockpile:	No adjustment - factor not applicable 0.00	0.000	(Cat HB)
Truck Ownership:	Common ownership of trucks and loaders - 0.04	-0.040	(Cat HB)
Operation:	Constant operation -0.04	-0.040	(Cat HB)
Dump Target:	Nominal target 0.00	0.000	(Cat HB)
	Net Cycle Time Adjustment:	-0.040	minutes
	Adjusted Basic Cycle Time:	0.460	minutes

Rolling Resistance – Road Conditions

Haul: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0
Return: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul and Return Time

	Length (feet)	Grade Res. (%)	Rolling Res. (%)	Total Res. (%)	Travel Time (minutes)	Source

Haul Route:	475	0.00	3.00	3.00	0.3861	(Cat HB)
Return Route:	475	0.00	3.00	3.00	0.3608	(Cat HB)

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

Load Bucket Capacity

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

Job Condition Correction Factors
Site Altitude: 4500 feet

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

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

JOB TIME AND COST

Fleet size: 2 Loader(s) Total job time: **60.84** Hours

Unit cost: $0.615 /LCY Total job cost: **$14,603**

SCRAPER TEAM WORK

Task description: **Spread 6 inches of topsoil over 99 acres**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 003 State: Colorado Abbreviation: None
Date: 4/17/2023 County: Pueblo Filename: M038-003
User: ANM

Agency or organization name: DRMS

HOURLY EQUIPMENT

COSTShift basis: 1 per day

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

Cost Breakdown:

	Scraper Work Team		Support Equipment		Maintenance Equipment	
	Scraper	Dozer	Load Area	Dump Area	Motor Grader	Water Truck
%Utilization-machine:	100	10	NA	NA	50	50
Ownership cost/hour:	$264.49	$92.78	NA	NA	$114.80	$14.98
Operating cost/hour:	$296.10	$7.93	NA	NA	$39.70	$16.66
%Utilization-ripper:	NA	0	NA	NA	NA	NA
Ripper own. cost/hour:	NA	$8.37	NA	NA	$0.00	$0.00
Ripper op. cost/hour:	NA	$0.00	NA	NA	$0.00	$0.00
Operator cost/hour:	$47.07	$40.04	NA	NA	$46.87	$0.00
Unit Subtotals:	$607.66	$149.12	NA	NA	$201.37	$31.64
Number of Units:	3	1	0	0	1	1
Group Subtotals:	Work:	$1,972.10	Support:	$0.00	Maint:	$233.01

Total work team cost/hour: **$2,205.11**

MATERIAL QUANTITIES

Initial volume: 79,860 CCY Swell factor: 1.000
Loose volume: **79,860** LCY

Source of estimated volume: Replacing 6” of topsoil over ~99 acres
Source of estimated swell factor: Cat Handbook

HOURLY PRODUCTION

Material weight: 2,100 lbs/LCY
Material description: Earth - Loam
Rated Payload: 81,600 pounds
Payload Capacity: 38.86 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: 4500 feet

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

Travel Time:

Road Condition: Firm, smooth, rolling, dirt/lt. surfaced, watered, maintained 3.0

Haul Route:

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

Haul Time: **1.18** minutes

Return Route:

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

Return Time: **0.79** minutes

Total Scraper team cycle time: **3.37** minutes
Adjusted for job conditions: 428.55 LCY/Hour
Selected Number of Scrapers: 3 Scraper(s)
Adjusted single scraper team (unit) hourly production: 1,285.64 LCY/Hour
Adjusted multiple scraper team (fleet) hourly production: **1,285.64** LCY/Hour

Unadjusted unit production/hour: 516.32 LCY/Hour
Optimal Number of Scrapers per push dozer:

JOB TIME AND COST

Fleet size: 1 Team(s) Total job time: **62.12** Hours

Unit cost: $1.715 /LCY Total job cost: **$136,975**

REVEGETATION WORK

Task description: **Revegetation of 99 acres**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 004 State: Colorado Abbreviation: None
Date: 4/17/2023 County: Pueblo Filename: M038-004
User: ANM

Agency or organization name: DRMS

FERTILIZING

Materials

Description	Units / Acre	Unit	Cost / Unit	Cost /Acre
Ammonium nitrate, 33-0-0	40.00	pound	$0.37	$14.80
Triple superphosphate, 0-46-0	40.00	pound	$0.47	$18.80
			Total Fertilizer Materials Cost/Acre	**$33.60**

Application

Description	Cost /Acre
Truck whirlwind spreader (MEANS 32 01 90.13 0140)	$16.55
Total Fertilizer Application Cost/Acre	**$16.55**

TILLING

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

SEEDING

Seed Mix	Rate – PLS LBS / Acre	Seeds per SQ. FT	Cost /Acre
Switchgrass - Blackwell	1.10	9.82	$12.65
Blue Grama - Lovington	0.50	8.16	$7.99
Sand Dropseed	0.05	5.97	$0.49
Little Bluestem - Pastura	1.10	6.57	$14.83
Sideoats Grama - Vaughn	3.20	10.51	$26.80
Totals Seed Mix	5.95	41.02	**$62.76**

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
Hay, delivered {MEANS 31 25 14.16 1200}	2.00	TON	$421.36	$842.72
Total Mulch Materials Cost/Acre				**$842.72**

Application

Description	Cost /Acre
Crimping, with tractor {DMG survey data}	$73.00
Power mulcher (MEANS 32 91 13.16 0350)	$141.57
Total Mulch Application Cost/Acre	**$214.57**

JOB TIME AND COST

No. of Acres:	99	Cost /Acre:	$1,809.78
Estimated Failure Rate:	25%	Cost /Acre*:	$294.76
*Selected Replanting Work Items:	SEEDING		

Initial Job Cost:	**$179,168.22**
Reseeding Job Cost:	**$7,295.31**
Total Job Cost:	**$186,464**
Job Hours:	**99.00**

EQUIPMENT MOBILIZATION/DEMOBILIZATION

Task description: **Mob**

Site: **Two Rivers** Permit Action: 2023 Inspection Permit/Job#: M1998038

PROJECT IDENTIFICATION

Task #: 005 State: Colorado Abbreviation: None
Date: 4/17/2023 County: Pueblo Filename: M038-005
User: ANM

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:	$15.25	$23.06	$37.58
Operating Cost/Hour:	$25.26	$30.83	$51.41
Operator Cost/Hour:	$27.71	$27.71	$27.71
Helper Cost/Hour:	$0.00	$20.22	$20.22
Total Unit Cost/Hour:	$68.22	$101.82	$136.92

NON ROADABLE EQUIPMENT:

Machine Description	Weight/ Unit (TONS)	Owner ship Cost/hr/ unit	Haul Rig Cost/hr/unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet	DOT Permit Cost/ fleet
Cat D7R DS XR Series II	35.93	$101.15	$101.82	1	$202.97	$101.82	$250.00
Cat 637G	57.28	$264.49	$136.92	3	$1,204.23	$410.76	$750.00
CAT 14M	23.57	$114.80	$68.22	1	$183.02	$68.22	$250.00
Drill/Broadcast Seeder with Tractor	25.00	$6.25	$68.22	2	$148.94	$136.44	$500.00
Power Mulcher (Bowie LD-90)	6.00	$14.79	$68.22	1	$83.01	$68.22	$250.00
CAT 950H high lift	20.13	$46.76	$68.22	2	$229.96	$136.44	$500.00
Subtotals:					**$2,052.13**	**$921.90**	**$2,500.00**

ROADABLE EQUIPMENT:

Machine Description	Total Cost/hr/ unit	Fleet Size	Haul Trip Cost/hr/ fleet	Return Trip Cost/hr/ fleet
Water Tanker, 3,500 Gal.	$48.30	1	$48.30	$48.30
Light Duty Pickup, 4x4, 3/4 T.	$87.03	1	$87.03	$87.03
Fuel Tanker, 4x2, 170 HP	$69.51	1	$69.51	$69.51
Lube Truck, 4x2, 190 HP	$76.19	1	$76.19	$76.19
Subtotals:			**$281.03**	**$281.03**

EQUIPMENT HAUL DISTANCE and Time

Nearest Major City or Town within project area region:	PUEBLO, CO	
Total one-way travel distance:	26.00	miles
Average Travel Speed:	50.00	mph
Total Non-Roadable Mob/Demob Cost * '* two round trips with haul rig:	$22,047.48	
Total Roadable Mob/Demob Cost ** ** one round trip, no haul rig:	$292.27	

Transportation Cycle Time:

	Non-Roadable Equipment	Roadable Equipment
Haul Time (Hours):	0.52	0.52
Return Time (Hours):	0.52	0.52
Loading Time (Hours):	1.70	NA
Unloading Time (Hours):	1.70	NA
Subtotals:	4.44	1.04

JOB TIME AND COST

Total job time: **8.88** Hours

Total job cost: **$22,340**