



May 14, 2021

Mr. David Otori  
Supervisor/ Senior Reclamation Specialist  
Mining and Minerals Division  
New Mexico Energy Minerals and Natural Resources Department  
1220 South St. Francis Drive  
Santa Fe, NM 87505

**Subject: Submission of the Construction Quality Assurance Report (CQAR) of the  
Disposal Cell: Section 9.E.1.a, Permit CI002RE, Rev. 13-2; Mt. Taylor Mine**

Dear Mr. Otori,

Rio Grande Resources Corp. (RGR) respectfully submits the attached document titled "Construction Quality Assurance Report (CQAR), Waste Rock Pile / Disposal Cell, Mt Taylor Mine, Rio Grande Resources Corp." The CQAR for the disposal cell is addressed under Section 9.E.1.a of Permit CI002RE, Rev. 13-2.

RGR submitted the CQAR for the disposal cell liner to NMED and MMD on February 22, 2020 (per discharge permit DP-61). RGR is submitting the attached CQAR for the disposal cell cover. Please refer to both documents for quality control information pertaining to the construction of the disposal cell.

If you have any questions, please contact me at (505) 287-7971 or by email at [bruce.norquist@ga.com](mailto:bruce.norquist@ga.com). A hard-copy of this document is also being sent by regular mail.

Sincerely,

A handwritten signature in dark ink that reads "Bruce Norquist". The signature is written in a cursive, flowing style.

Bruce Norquist  
Facilities Manager, Mt. Taylor Mine  
Rio Grande Resources Corporation

CC: Ashlynne Winton, NMED (via email)

# **CONSTRUCTION QUALITY ASSURANCE REPORT ("CQAR")**

## **WASTE ROCK PILE / DISPOSAL CELL**

### **MT TAYLOR MINE**

#### **RIO GRANDE RESOURCES CORP. (RGR)**

5/7/2021

## **1 INTRODUCTION**

### **1.1 Background**

This report responds to reporting requirements of both the Mining and Minerals Division (MMD) of the New Mexico Energy Mineral and Natural Resources Department and the New Mexico Environment Department's Mining Environmental Compliance Section (MECS) related to construction of the waste rock pile and disposal cell for closeout of the Mt Taylor Mine. Mine Permit CI002RE Revision 13-2, Section 9E1, states that "The Permittee shall submit a Construction Quality Assurance Report ("CQAR") of the disposal cell to MMD within 180 days after completion of the disposal cell". In Permit Condition 32 of Discharge Permit-61, Renewal and Modification dated October 14, 2015, MECS requires RGR to document the construction quality assurance (CQA) of the clay liner of the disposal cell (see Drawing Sheet SW06-AB); that report has been previously submitted.

The Mt Taylor Mine was constructed in 1974-1980 to mine uranium from deposits located more than 3000 feet below ground surface near San Mateo, New Mexico. During the period of 1980-1990, substantial volumes of non-ore rock were mined and placed in a waste pile within the mine permit area. Some of this waste rock contained elevated levels of uranium and radium (radiological contamination, or radwaste). During that same period a large volume of ground water, some of which also contained elevated levels of radiological contamination, was pumped from the mine and treated in the Mine Water Treatment Unit (MWTU) before being discharged from the site. During those years, MWTU treatment-pond sediments and surficial soils with radiological contamination accumulated on the mine site.

In 2013 RGR submitted RGR's Closeout/ Closure Plan (CCP), Rev 1, 2013 and modified it in 2015. Both the MMD and MECS approved that CCP. The area covered by the waste pile prior to closeout/ closure was 11.5 acres. Until RGR decided late 2019 to cancel its plans to reactivate the mine, the build-out of the waste pile was to include a reactivation cell to contain radwaste excavated during reactivation, and a subsequent separate disposal cell for containment of the radwaste excavated was planned to be constructed at closeout. When reactivation was canceled, the latter cell was eliminated and now all radwaste is to be placed in a single disposal cell, to be constructed on the waste pile and within its 11.5-acre footprint, for the relocation of radwaste removed from elsewhere on the mine site. In the first step of closeout/ closure, the solid radwaste has been removed from the mine water treatment unit (MWTU) pond basins and the south storm water pond (SSWP) pond basin. After removal of ore from the site has been completed, radwaste from the ore pad, ore pad pond, and other mine areas will be removed and placed in the disposal cell.

Recently, RGR's radiological consultant (ERG) identified more areas and greater depths of radwaste within the mine permit area than had been previously estimated for the 2013 CCP. As a result of this larger volume of radwaste, the capacity for radwaste containment in the existing disposal cell was reached in 2020, as anticipated by RGR when in May 2020 it submitted a request to MMD and NMED for expansion of the waste pile/ disposal cell footprint from 11.5 acres to 19.3 acres. The additional 7.8 acres of space is available primarily to the east and slightly to the north of the 11.5 acre footprint. At the time of this report, RGR is awaiting MECS approval for this expansion.

As of the end of 2020, all components of the 11.5-acre waste pile and disposal cell (clay liner, stored radwaste, and cover) have been placed. Therefore, the disposal cell as presently approved has been completed, and this report documents that milestone. A subsequent report will be prepared to document the expansion of the waste pile/disposal cell to 19.3 acres, if that expansion is approved by MECS.

## **1.2 Purpose and Scope**

This report is intended to document the construction of the disposal cell and related portions of the waste pile within the original 11.5 acres of the waste pile footprint. A subsequent report will address expansion of the disposal cell that occurs in 2021 and later years. This report addresses:

- Design of the disposal cell and changes in design during the period of construction.
- The chronology and records of construction based on the QC daily diaries.
- Soils used in cover construction, including lab and field test data.
- As-built drawings of the waste pile and disposal cell constructed as of the date of this report.

## **2 DESCRIPTION OF THE CONSTRUCTION QUALITY CONTROL PROGRAM**

### **2.1 Construction Quality Management Plan**

RGR's Construction Quality Control Program (QC Program) for all quality-related construction at the Mt Taylor Mine follows the Rio Grande Resources Corporation (RGR) Construction Quality Management Plan (CQMP), dated 6/15/2018 and submitted to MECS and MMD on 8/1/2018, for construction and closeout activities at the mine. The CQMP incorporates relevant elements of quality control (QC) and quality assurance (QA) that align with Best Management Practices (BMP) of the mining and civil construction industries. The CQMP responds to Condition E.1.a of Revision 13-2 ("Revision 13-2" or "Revision") to Permit No. CI002RE Conditions 31 and 32 of the NMED Discharge Permit DP-61 but applies more broadly to all construction activities of mine closeout/ closure.

### **2.2 Quality Responsibilities of Project Participants**

- RGR Facilities Manager, the Owner's Project Manager, was responsible for direction of all contractors, for QA/QC oversight, and for maintenance of all quality-related records.
- The lead design engineer, Alan Kuhn Associates LLC (AKA) and its subcontractor, EL Engineering Services LLC provided oversight of construction in determining compliance with design, troubleshooting, and supporting documentation and reporting. They prepared design changes and variances to specifications and

drawings as needed to respond to actual conditions encountered during construction.

- The QC contractor (NV5, Inc.), under contract directly to RGR, provided on-site inspection, testing and documentation for earthwork. At least one qualified QC inspector was on site during all construction activity performed under specification. The QC inspector reported directly to the RGR Facilities Manager.
- Environmental Restoration Group, Inc. (ERG) provided radiological health and safety training, gamma scanning, and radiological testing of contaminated sediment and soil to determine that contaminated pond sediments and soil were removed for disposal in the waste pile disposal cell. ERG also performed radon flux measurements for evaluation of waste pile cover radon attenuation.
- The three general contractors (Enviroworks Inc., Taylor Services, and Strickland Services LLC), each performed portions of the earthwork on the waste pile and were responsible for following the drawings and specifications and reporting any conditions or events that were potentially quality-impacting.

## **2.3 Construction Specifications and Drawings**

### **2.3.1 Specifications**

Specification No. MW-CB01-00, EARTHWORK FOR POND RECONSTRUCTION, was issued in 2018 and used in the construction of the waste pile and disposal cell and clay liner for the initial portion of the disposal cell. Despite its title, it was originally intended to be used for all earthwork on the site, with Section 2.2 specific to this work.

In June 2020, Specification No. MW-CB02-00, EARTHWORK FOR WASTE PILE AND DISPOSAL CELL COVER CONSTRUCTION, was prepared to address the remainder of the disposal cell construction and the loam cover over the clay radon barrier. In this specification, RGR made no changes to the radon-barrier clay soil properties, placement or compaction, but a seeding medium of loam soil was added after this requirement was issued by MMD (See Section 2.3.2).

### **2.3.2 Drawings**

Drawings issued for construction are listed in Table 1. As-built drawings are listed in Table 2 and are contained in Attachment A.

## **3 CONSTRUCTION QUALITY RECORDS**

Quality records were prepared by each of the project participants. As they were submitted to RGR and AKA, they were reviewed and evaluated for conformance with quality requirements in each specification, then compiled into the master project record files. The quality records relevant to the waste pile and disposal cell construction are contained in the attachments to this report listed below:

Attachment A – As-built Figure and Drawings

Attachment B – Construction Photos

Attachment C - Daily Diaries and Soil Test Results (NV5)

**Table 1 – Drawings issued for construction**

Sheet Number	Drawing Number	Sheet Title
C00	GS20-CB100-00	Overall Site Map and Drawing Index
C01	GS20-CB101-00	Site Plan
C02	GS20-CB102-00	Lower West Slope Grading Plan
C03	GS20-CB103-00	Lower South Slope Grading Plan
C04	GS20-CB104-00	Upper Slopes – Reshape Existing Grades
C05	GS20-CB105-00	Upper Slopes – Final Grading Plan
C06	GS20-CB106-00	Drainage Bench – Plan View
C07	GS20-CB107-00	Drainage Bench - Sections
C08	GS20-CB108-00	Borrow Area “A” – Grading Plan
C09	GS20-CB109-00	Borrow Area “B” – Grading Plan
C10	GS20-CB110-00	West Slope Details
C11	GS20-CB11-00	South Slope Details

**Table 2 – As-built figure and drawings**

Figure 1	NA	Drone imagery of waste pile and disposal cell, 2/2/21
Sheet Number	Drawing Number	Sheet Title
SW01-AB	GSSW-CB101-AB	Waste Rock Pile/ Disposal Cell As-Built – February 2021
SW02-AB	GSSW-CB102-AB	Section Through The Disposal Cell (As-Built February 2021)
SW06-AB	GSSW-CB106-AB	Disposal Cell Clay Liner (As-Built August 2018)
None	None	Disposal Cell Cover Soil Compaction Test Locations, Performed in 2020

### **3.1 Construction Quality Summary**

The following are summaries of QC results that are documented in detail in the attachments.

#### **3.1.1 Conformance with Design**

The construction of the waste pile and disposal cell generally conformed to the design submitted previously and described in the specifications and drawings identified above. The exception was the size of the disposal cell. The volume of pond sediment and other contaminated soil found during excavation was substantially larger than estimated in 2013, requiring the dimensions of the disposal cell and cover to be increased both vertically and horizontally. In 2020 the space available within the 11.5-acre footprint was filled with radwaste. Drawings that depict the proposed expansion of the waste pile/ disposal cell to 19.3 acres were submitted to MMD and NMED in May 2020.

There were no variances (changes requested by the contractor) in the earthwork construction from the earthwork design. However, due to the substantially larger actual volume of radwaste than was originally estimated, dimensions of the disposal cell were increased. Although the actual volume of contaminated sediment and soil was greater than estimated, the uncertainties about depth of contamination and volume of radwaste were identified in the design changes and made known to the contractors. Consequently, no variance was required and the design dimensions were readily changed.

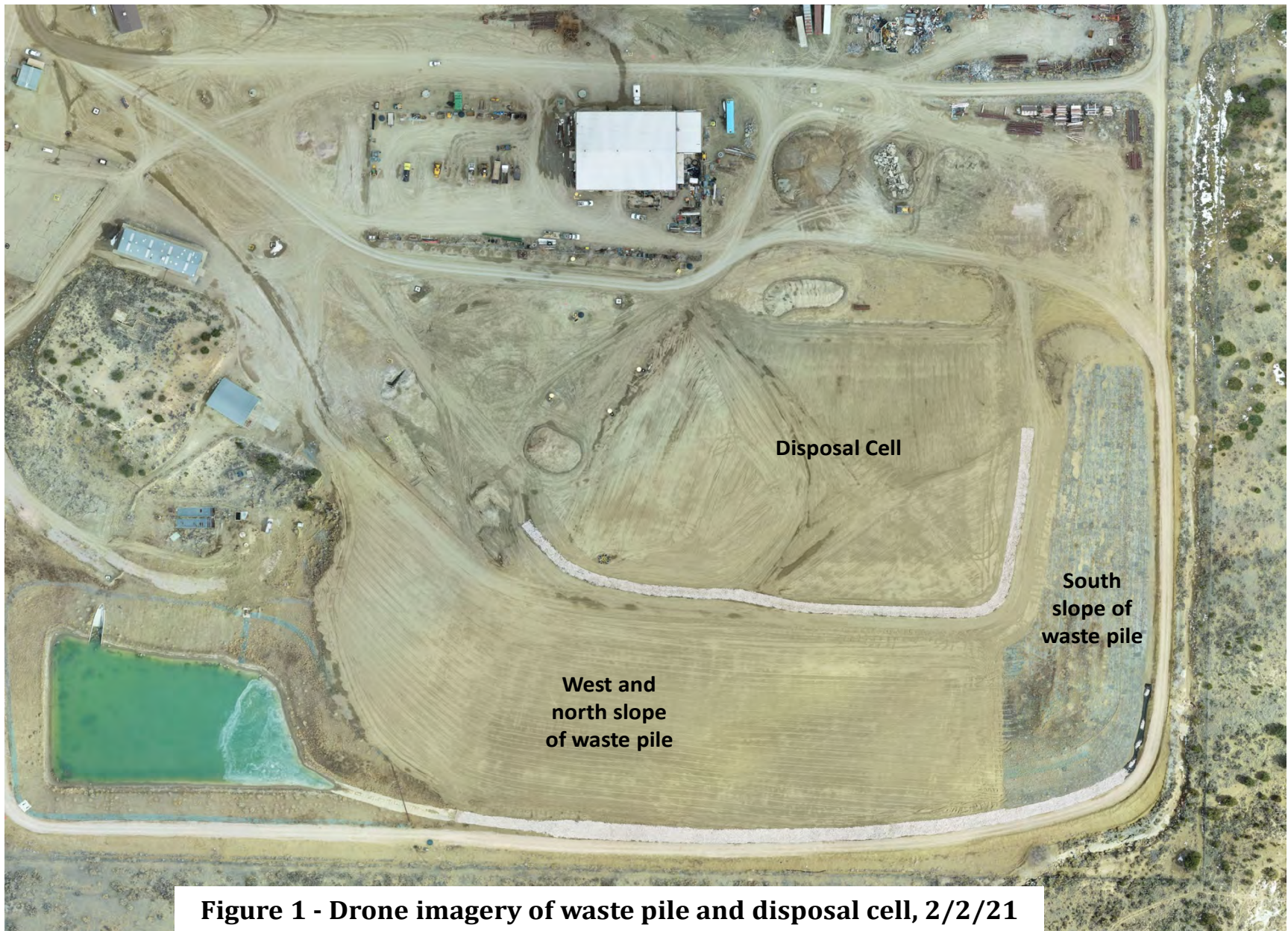
#### **3.1.2 Conformance with Permit Requirements**

The requirements of DP-61 and Mine Permit No. CI002RE, Rev. 13-2, as well as subsequent written and verbal instructions from MMD and NMED, were satisfied in the construction of waste pile and disposal cell. The QC program conformed to Rio Grande Resources' Construction Quality Management Plan (CQMP), REV. 0, dated 6/15/2018 and the Quality Control sections of the relevant specifications.

**ATTACHMENT A**  
**AS-BUILT FIGURE AND DRAWINGS**

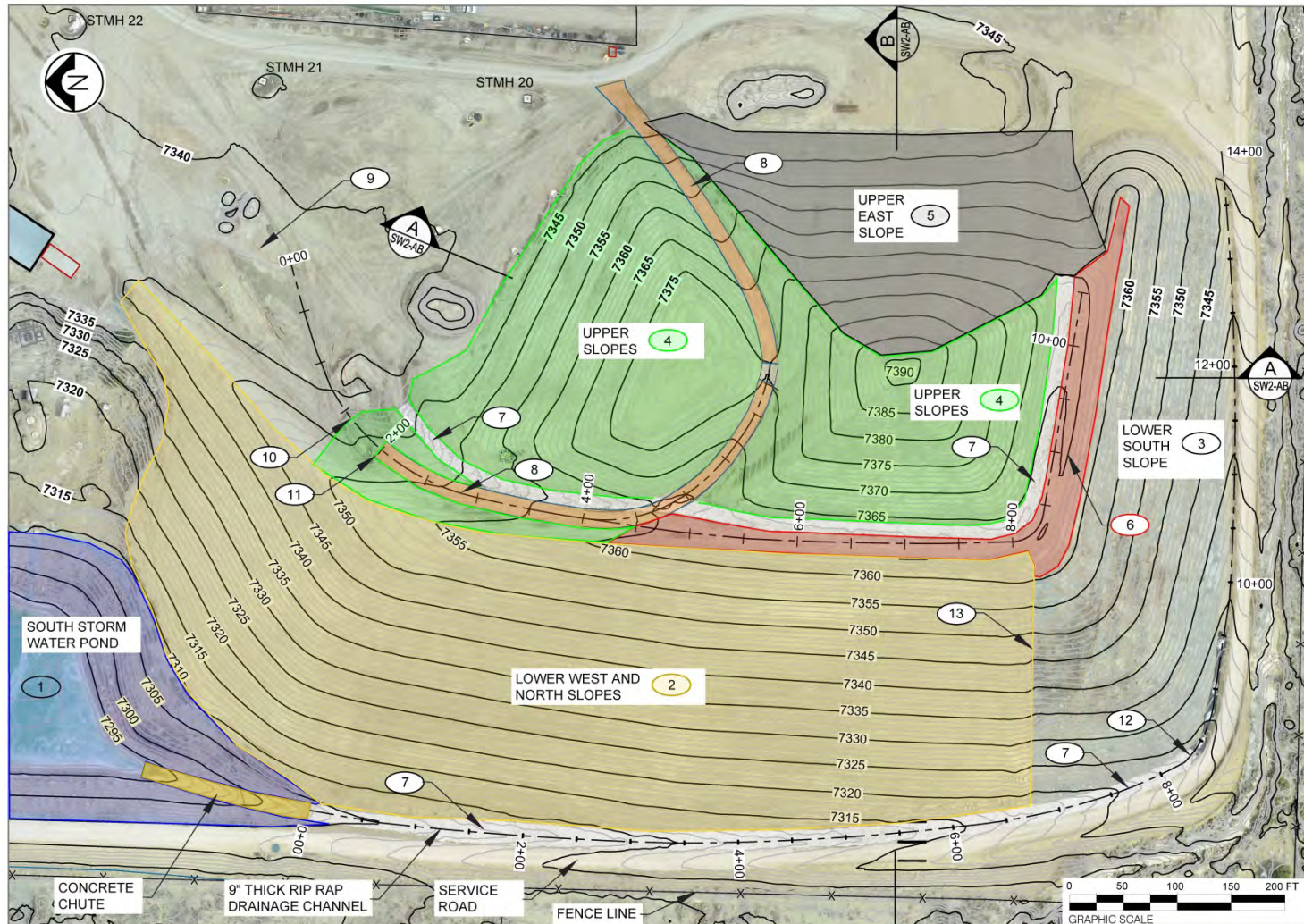
**CONSTRUCTION QUALITY ASSURANCE REPORT ("CQAR")**  
**WASTE ROCK PILE / DISPOSAL CELL**  
**MT TAYLOR MINE**





**Figure 1 - Drone imagery of waste pile and disposal cell, 2/2/21**





# NOTES AND LEGEND:

- 1 SOUTH STORM WATER POND - CLEAN SOIL COVERED WITH 2' THICK CLAY LINER AND 6" SOIL PROTECTIVE COVER.
- 2 LOWER WEST AND NORTH SLOPES - WASTE ROCK COVERED WITH 2' THICK CLAY RADON BARRIER AND 12" LOAM GROWTH MEDIA.
- 3 LOWER SOUTH SLOPE - CONSTRUCTED WITH CLEAN SOILS.
- 4 UPPER SLOPES - CONTAMINATED SOILS COVERED WITH 2' THICK CLAY RADON BARRIER AND 18" LOAM GROWTH MEDIA.
- 5 UPPER EAST SLOPE - CONTAMINATED SOILS COVERED WITH 6" THICK CLAY.
- 6 DRAINAGE BENCH - 2' THICK CLAY RADON BARRIER AND LOAM GROWTH MEDIA OF VARYING THICKNESS.
- 7 RIP RAP - 9" TO 12" THICK - WIDTH VARIES - ARMOR FOR DRAINAGE SWALE
- 8 ACCESS RAMPS - 2' THICK CLAY RADON BARRIER AND 6" ROAD GRAVEL COVER.
- 9 FUTURE TOE OF RAMP OUTLINE.
- 10 CLAY RADON BARRIER ENDS AT STATION 1+60.
- 11 RAMP GRADING ENDS AT STATION 2+00.
- 12 LOWER RIP RAP CHANNEL ENDS AT STATION 8+20
- 13 LOAM GROWTH MEDIA ON LOWER WEST SLOPE ENDS AT STATION 6+60

1. THE TOPO LINES (1' CONTOURS) AND ELEVATIONS SHOWN ON THIS PLAN REFLECT THE GRADES OF THE WASTE ROCK PILE / DISPOSAL CELL ON FEBRUARY 2, 2021. THE BACKGROUND PHOTO AND TOPOGRAPHIC INFORMATION IS BASED ON THE DRONE SURVEY BY S3 SURVEYORS DATED 2-2-2021.

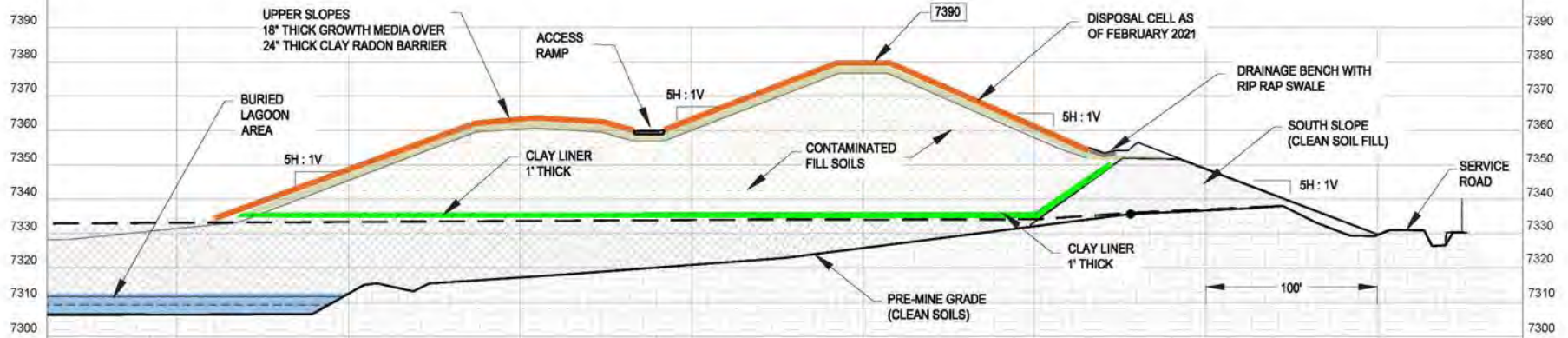


<b>RIO GRANDE RESOURCES CORP.</b> MOUNT TAYLOR MINE - San Mateo, NM		
Prepared By:	Drawn By:	PRINT SIZE:
Alan Kuhn Associates LLC	EL Engineering Services LLC	B
		SCALE:
		As Shown

SHEET TITLE: WASTE ROCK PILE / DISPOSAL CELL AS-BUILT - FEBRUARY 2021		
SHEET NO.	DWG NO.	
SW01-AB	GSSW-CB101-AB	AB

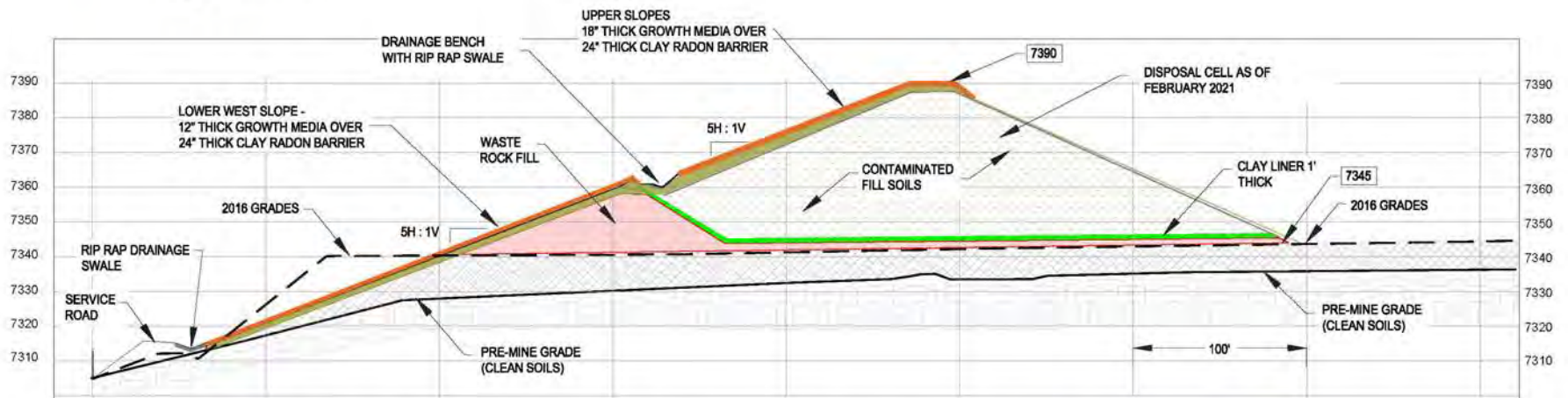


C



**AA** SECTION AA - N/S SECTION THROUGH WASTE ROCK PILE AND DISPOSAL CELL  
(FEBRUARY 2021)

B



**BB** SECTION BB - E/W SECTION THROUGH EXISTING WASTE ROCK PILE AND DISPOSAL CELL  
(FEBRUARY 2021)

NOTE: SITE TOPOGRAPHY BASED ON SURVEY DATA BY S3  
DISPOSAL CELL SURVEY PERFORMED ON FEBRUARY 2, 2021.



<b>RIO GRANDE RESOURCES CORP.</b> MOUNT TAYLOR MINE - San Mateo, NM			SHEET TITLE SECTIONS THROUGH THE DISPOSAL CELL (AS-BUILT FEBRUARY 2021)	
Prepared By:	Drawn By:	PRINT SIZE:	SHEET NO:	DWG NO:
Alan Kuhn Associates LLC	EL Engineering Services LLC	B		
SCALE: As Shown			<b>SW02AB</b>	<b>GSSW-CB02-AB</b>
				<b>AB</b>

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3

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B

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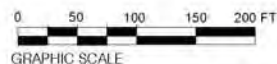
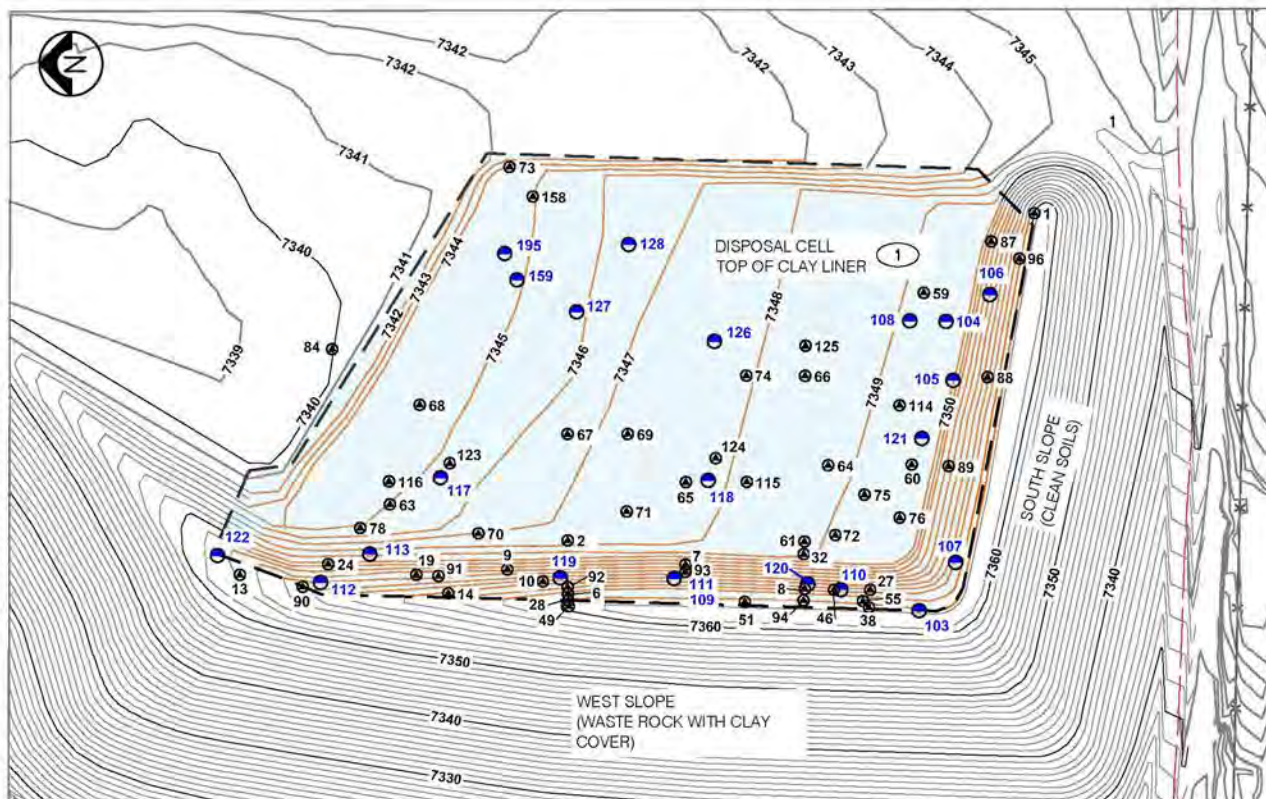
B

A

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A



1. THE TOPO LINES AND ELEVATIONS SHOWN ON THIS PLAN REFLECT THE FINAL GRADES ON THE SURFACE OF THE CLAY LINER OF THE DISPOSAL CELL. TOPO SHOWN BASED ON SURVEY IN AUGUST 2018 BY CSTI, LLC AND ADJUSTED ACCORDING TO FIELD OBSERVATIONS BY EL ENGINEERING, LLC.



REV.	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
AB	AS-BUILT DRAWING (2018)	1-26-2021	EL	EL	AK



**RIO GRANDE RESOURCES CORP.**  
MOUNT TAYLOR MINE - San Mateo, NM

Prepared By:  
Alan Kuhn Associates LLC

Drawn By:  
EL Engineering Services LLC

PRINT SIZE:  
**B**  
SCALE:  
As Shown

SHEET TITLE  
DISPOSAL CELL CLAY LINER  
(AS-BUILT - AUGUST 2018)

SHEET NO.  
**SW06-AB**

DWG NO.  
**GSSW-CB106-AB**

**AB**

### Key Map



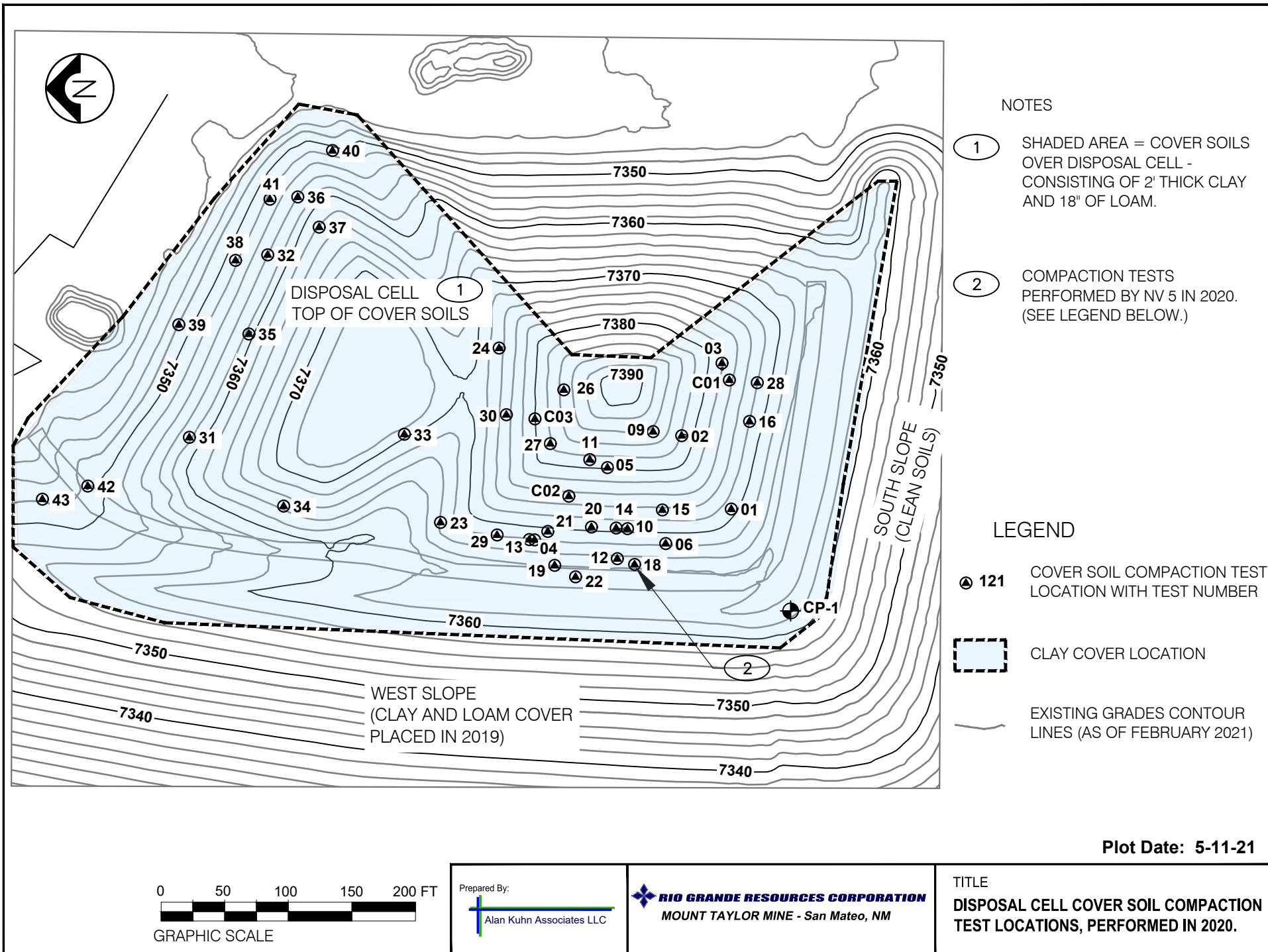
### NOTES

- CLAY LINER IN DISPOSAL CELL - CONSISTING OF 1' THICK COMPACTED CLAY LINER IN SHADED AREA. ELEVATIONS PER CSTI SURVEY IN AUGUST 2018. TOTAL SURFACE AREA OF LINER = 4.7 ACRES
- LINER COMPACTION TESTS PERFORMED BY NV 5 FROM JULY 2018 TO NOVEMBER 2018. (SEE LEGEND BELOW.)

### LEGEND

- 121 CLAY LINER COMPACTION TEST LOCATION WITH TEST NUMBER
- 76 SUBGRADE COMPACTION TEST LOCATION WITH TEST NUMBER
- CLAY LINER LOCATION
- CLAY LINER CONTOUR LINE (TOP OF CLAY LINER)
- EXISTING GRADES CONTOUR LINE







**ATTACHMENT B**  
**CONSTRUCTION PHOTOS**

**CONSTRUCTION QUALITY ASSURANCE REPORT ("CQAR")**  
**WASTE ROCK PILE / DISPOSAL CELL**  
**MT TAYLOR MINE**



Photo 1 - Clay liner of disposal cell, under construction, from west berm of cell



Photo 2 - Contaminated sediment in place in disposal cell, nearing capacity in the 11.5 acre footprint



Containment Cell / Waste Rock Pile  
11-13-19



Photo 3 - Disposal cell near capacity with 11.5 acre footprint, looking west



Photo 4 - Final grading of contaminated sediments and soil in disposal cell prior to cover placement





Photo 5 – Radon barrier being placed of the east slope of the disposal cell



Photo 6 – Cover placement on the top of the disposal cell





Photo 7 – West slope bench under construction.



Photo 8 - West slope of waste pile with radon barrier partially in place.





Photo 9 - West slope of waste pile with radon barrier in place



Photo 10 - Riprap placement in drainage ditch at toe of west slope of waste pile





Photo 11 – Growth media being placed on west slope of disposal cell.

**ATTACHMENT C**  
**DAILY DIARIES AND SOIL TEST RESULTS (NV5)**

**C.1 Daily Diaries**

**C.2 Grain Size and Plasticity Tests**

**C.3 Proctor Tests**

**C.4 Hydraulic Properties**

**C.5 Compaction Tests**

**C.6 Riprap Tests**



## **C.1 Daily Diaries**

# N V 5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/19/2020

NV5 Job No: 444320-7350000.00

Time: 8:00 AM - 5:00 PM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:00 AM. Technician checked on onsite lab to make sure all equipment was functional. Technician got with Bruce (RGR) and went over plans and specifications. Technician along with Bruce (RGR) got together with Strickland who will be doing the earthwork. Also got with S3 Surveyors to see how best to lay out what will be needed to get earthwork crew started. Technician also did a quick review on what stockpiles were onsite at this time.

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/20/2020

NV5 Job No: 444320-7350000.00

Time: 8:00 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:00 AM. Technician got with Brandon (Strickland) to see what the plan of the day will be. Strickland still mobilizing equipment and getting current plans into equipment GPS's. Technician pull material from stockpiles around site to verify material. Samples 20-195, 20-196, 20-197 taken for classification. Technician worked in onsite lab to prepare samples for classifications. Technician was present with Bruce (RGR) when conversation with Ed Loescher on some plan clarifications and execution. Technician did get approval from Ed on putting in the first lift of clay cover in a one foot lift to help equipment from mixing clean clay cover material with contaminated material being covered.

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/21/2020

NV5 Job No: 444320-7350000.00

Time: 7:30 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 7:30 and got with Brandon (Strickland) on the plan of the day. Today Strickland is working on access road to borrow area "B" and also reshaping the disposal cell to the current model. Technician worked in onsite lab getting samples taken on 10/20/20 classified.

Technician completed samples 20-195 and 20-196. Technician got with Bruce (RGR) and went over plans and specifications.



# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/22/2020

NV5 Job No: 444320-7350000.00

Time: 7:30 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 7:30 AM and got with Strickland (Brandon) on plan of the day. Strickland will continue re-shaping disposal cell as per sheet number GS20-CB104-00 of plans. Brandon will also begin processing stockpiles near disposal cell. Technician will work in onsite lab and finish verifying stockpiles for future use and processing. Technician also went over borrow area "B" plans (sheet number GS10-CB109-00) with Bruce (RGR) and reminded him that there is an old well head or well cap in southeast corner of borrow area "B". This well cap is in 'footprint' of the expansion of borrow area "B". Technician got with Brandon and went into borrow area "B" and used excavator to verify the presence of desired material.

# N V 5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/28/2020

NV5 Job No: 444320-7350000.00

Time: 8:30

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:30 Am. Site conditions are wet and muddy due to winter snow the past two days. No work on clay cover Monday (10-26-20) through Tuesday (10/27/20). Today Brandon (Strickland) moved equipment into borrow area "B" to start processing clay cover material to be used on disposal cell. While radon barrier cover in specification No. MW-CB02-00 (Earthwork for waste pile and disposal cell cover construction). Section 2.3.1 (Radon Barrier Cover) will be 2 feet thick and shall be classified as CL, CH or SC. Bruce (RGE Corp.) has requested technician to try and get at better cover by going with the CL, CH classification due to data from material used on the first phase clay cover (Radon Barrier) on west slopes on waste rock. The CL, CH material will come from mainly borrow area "B" at this time. Sample 20-205 was obtained from borrow area "B" and D698 proctor will be done on this material prior to placement.

# N V 5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 10/29/2020

NV5 Job No: 444320-7350000.00

Time: 8:00

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:00 AM and got with Brandon (Strickland) on plan of the day. Strickland will continue to reshape disposal cell and continue to process material from borrow area "B". Due to site condition of wet and muddy. This will be a slow process today. Technician worked in onsite lab on samples 20-197 and 20-205. Technician also monitored processing in borrow area "B".



# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/2/2020

NV5 Job No: 444320-7350000.00

Time: 8:00

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:00 AM. Technician got with Brandon (Strickland) to see what the plan for the day was/is. Strickland and technician also got with Bruce (RGR Corp.) and went over materials to use for clay cover and on sequence of areas to work to prevent cross contamination of soils.

Strickland will use stockpile north of disposal cell then move to stockpile east of disposal cell.

Technician took sample from both stockpiles as Strickland starting processing these stockpiles.

Samples 20-207 and 20-208 taken at this time. Strickland started the first lift on the southern slope

of upper area. Technician verified that Strickland placed lift as per 2.3.1 (Radon Barrier Cover) of

specification number MW-CB02-00 (Earthwork for Waste Pile and Disposal Cell Cover Construction).

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/3/2020

NV5 Job No: 444320-7350000.00

Time: 9:30

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 9:30 AM. Technician was present as Strickland placed material on upper south slope and upper west slope. Strickland also continuing to reshape upper ramp area and drainage bench as per drawing number GS50-CB104-00 rev. A. Technician worked on samples 20-207 and 20-208 in onsite lab. These samples are proctors for clay cover material as per specifications MW-CB02-00 (Earthwork for Waste Pile and Disposal Cell Cover Construction). Strickland combined and processed material north of disposal cell (sample 20-208) and started processing material east of disposal cell (sample 20-207).

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/11/2020

NV5 Job No: 444320-7350000.00

Time: 8:00 AM - 3:00 PM

Contractor: Strickland

Tech.: Geoffrey Juskiewicz

## Daily Diary

Material from borrow area "A" was processed and placed on the upper west and north slopes. All the material that was placed was compacted by the contractor. The material and its compaction appeared to comply with the project plans and specifications. Bruce with RGR and the contractor personnel were notified of the test results.



# N V 5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/16/2020

NV5 Job No: 444320-7350000.00

Time: 8:15 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:15 AM. Technician got with Strickland crew on plan of the week. Plan is to continue processing material in borrow area "A" and put first lift of clay cover on north section slopes. Placement will continue of south slope and work around west to north. Bruce (RGR Corp.) was notified of plan and had quick meeting with Brandon (Strickland) on progress of work and time schedule, technician present. All processing and placement observed by technician placement appears to be in general accordance with specification MW-CB02-00 at this time.

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/18/2020

NV5 Job No: 444320-7350000.00

Time: 8:15 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician along with Geoffrey (NV5) arrived onsite today at 8:15 AM. Both technicians took samples from rip rap piled imported by Strickland. These samples are to ensure that materials meets specifications in MW-CB02-00 (Earthwork for Waste Pile and Disposal Cell Cover Construction) section 2.4.2 (Rip Rap). Technician also took sieve measurements to ensure compliance for size. Technician also was present to observe Strickland processing and placement of clay cover material as per specifications in MW-CB01-00. All appears to be in general accordance with specifications at this time.

# N V | 5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/19/2020

NV5 Job No: 444320-7350000.00

Time: 8:00 AM - 3:00 PM

Contractor: Strickland

Tech.: Geoffrey Juskiewicz

## Daily Diary

The contractor processed and hauled clay material from borrow "B" and placed it on the contaminated material. All the clay cover material and its compaction appeared to comply with the plans and specifications.



NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/20/2020

NV5 Job No: 444320-7350000.00

Time: 8:30 AM

Contractor: Strickland

Tech.: Joe Deans

### Daily Diary

Technician arrived onsite at 8:30. Today technician picked up samples from proctors 20-20 and 20-20. Bruce (RGR Corp) has requested hydro conductivity testing be done on both borrow area "A" and borrow area "B". This testing will be done through coordination with Alan Kuhn and Daniel B Stephens and Associates. Samples taken to Albuquerque.

# N V 5

**Project:** Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

**Client:** Rio Grande Resources Corp.

**Date:** 11/23/2020

**NV5 Job No:** 444320-7350000.00

**Time:** 8:15 AM

**Contractor:** Strickland

**Tech.:** Joe Deans

## Daily Diary

Technician arrived onsite at 8:15 AM. Technician was present to observe Strickland process and place material from borrow area "B" onto disposal cell slopes. Strickland is placing final lift of clay cover material on the north section (north pyramid), west side and north sides. Technician got with Brandon on making sure material is processed with appropriate moisture prior to placing on slope. Processing with dozer on slopes is not possible so all processing has to be done prior to placing material on slopes.

# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/24/2020

NV5 Job No: 444320-7350000.00

Time: 8:00 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:40 AM. Technician observed Strickland continue to process clay cover material in borrow area "B" and place material on lower north slope of disposal cell as per specifications in MW-CB02-00. Technician present for meeting with Brandon (Strickland) and Bruce (RGR Corp.) on moving into the next phase of placing the growth media on the clay cover. Also mentioned was placing 1' clay cover on east side of disposal cell (future expansion area of disposal cell).



# NV5

Project: Mt. Taylor Mine Clay Cap & Growth  
Medium Soil 2020-2021 - San Mateo, NM

Client: Rio Grande Resources Corp.

Date: 11/25/2020

NV5 Job No: 444320-7350000.00

Time: 8:15 AM

Contractor: Strickland

Tech.: Joe Deans

## Daily Diary

Technician arrived onsite at 8:15 AM. Strickland is processing clay cover material in borrow area "B" and is starting on the east side of disposal cell. Bruce (RGR Corp.) wants to put a 12" clay cover in this area to cover contaminated material until future expansion is approved. Technician got with Paul (Strickland) on making east slope more level prior to clay cover placement. Technician also dug through clay cover on south, west, and north sections of upper slopes to verify thickness of clay cover.

North side clay cover 24" Thick

West side clay cover 24" Thick

South side clay cover 28" Thick

Densities appear to be in general accordance with plans and specifications at this time.

## **C.2 Grain Size and Plasticity Tests**

Client: Rio Grande Resources Corporation

Project Number: 444320-7350000.00

Project: Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled: 10/20/20      Sample Number: 195

Location: Stockpile of clay material east of disposal cell

**Sieve Analysis Test Results**

ASTM D422			
Sieve Size	% Passing By Weight	Specs	Specs
3"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"	100		
#4	99		
#8	98		
#10	98		
#16	97		
#30	96		
#40	94		
#50	91		
#80	71		
#100	67		
#200	42.5		
Specs			

ASTM D 4318   LL: 30  
PI: 13

ASTM D2487 Unified Classification: SC

AASHTO M145 Classification: A-6

Revision 11/21/12



Client: Rio Grande Resources Corporation

Project Number: 444320-7350000.00

Project: Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled: 10/20/20      Sample Number: 196

Location: Stockpile of select fill NE of disposal cell

### Sieve Analysis Test Results

ASTM D422

Sieve Size	% Passing By Weight	Specs	Specs
3"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"	100		
#4	99		
#8	98		
#10	98		
#16	98		
#30	97		
#40	96		
#50	94		
#80	75		
#100	70		
#200	44.3		
Specs			

ASTM D 4318   LL: 30

PI: 12

ASTM D2487 Unified Classification: SC

AASHTO M145 Classification: A-6

Revision 11/21/12

Client: Rio Grande Resources Corporation

Project Number: 444320-7350000.00

Project: Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled: 10/20/20      Sample Number: 197

Location: Stockpile material from borrow area "A"

**Sieve Analysis Test Results**

Sieve Size	ASTM D422 % Passing By Weight	Specs	Specs
3"			
2"			
1 1/2"			
1"			
3/4"	100		
1/2"	99		
3/8"	99		
#4	98		
#8	98		
#10	97		
#16	97		
#30	96		
#40	95		
#50	93		
#80	81		
#100	77		
#200	57.6		
Specs			

ASTM D 4318   LL: 28

PI: 10

ASTM D2487 Unified Classification: CL

AASHTO M145 Classification: A-4

Revision 11/21/12

Project: Mt Taylor Mine Clay Cap & Growth Medium Soil 2020-2021  
 Client: Rio Grande Resource  
 Project Number: 444320-7350000.00  
 Sample Location: 234

### SIEVE ANALYSIS +10 Material

Original Air dry wt 50.04  
 Original dry wt. 49

if no +10 enter .1

### HYDROSCOPIC MOISTURE

Weight wet soil (g): 31.59  
 Weight dry soil (g): 31.27  
 Tare Weight (g): 16.36  
 Moisture (%): 2.1%  
 Hygro Moist CF 0.978989  
 Initial dry wt (g): 50.04  
 Cal Dry wt 48.99 for 14.1  
 Cal Dry Weight (g): 48.99 by moisture  
 % of orig Sample 99.98%

	Sieve	Wt Rtnd	% passing	
	3/4"	0.0	100	
	1/2"	0.0	100	
	3/8"	0.0	100	
	#4	0.0	100	
	#8	0.0	100	% rntd
	#10	0.0	100	0.0
proportional +10		0		Corrected
	Sieve	Wt Rtnd	Corrected	% passing
From	#16	0	0.0	100.0
Hydrom	#30	0.6	0.6	98.8
	#40	0.9	0.9	98.2
	#50	1.8	1.8	96.3
	#80	7	7.0	85.7
e	#100	10.2	10.2	79.2
	#200	14.8	14.8	69.8

### HYDROMETER

2.597 = Specific gravity of soil, (G)

48.99 = Weight soil dispersed (g) corrected for +10 (W in 14.2)

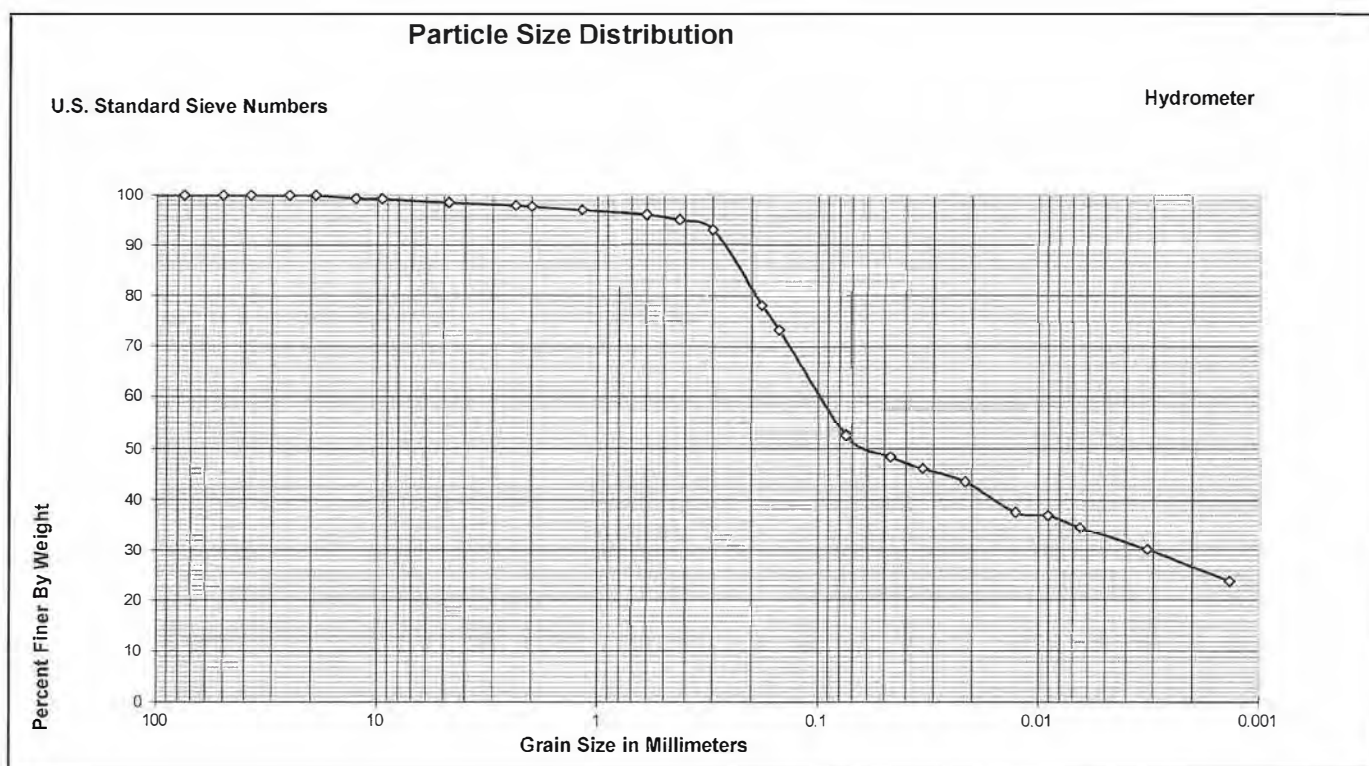
correction factor  $p_{11}$

3319

Elapsed time (min)	Temp (C)	Actual Reading	Composite Correction	Corrected Reading R	Effective Depth	Viscosity (n) (poise)	K	Particle Daim (mm) D	Percent Finer	Corrected % passing
1	20.5	1.01800	0.0034	1.01460	11.5	0.009981	0.01383	0.0469	48.5	48.5
2	20.3	1.01730	0.0034	1.01390	11.7	0.010028	0.01386	0.0335	46.1	46.1
5	20.1	1.01650	0.0034	1.01310	11.9	0.010075	0.01390	0.0215	43.5	43.5
15	19.7	1.01470	0.0034	1.01130	12.4	0.010168	0.01396	0.0127	37.5	37.5
30	19.3	1.01450	0.0034	1.01110	12.4	0.010262	0.01402	0.0090	36.8	36.8
60	19.1	1.01380	0.0034	1.01040	12.6	0.010308	0.01406	0.0064	34.5	34.5
250	19.5	1.01250	0.0034	1.00910	13.0	0.010215	0.01399	0.0032	30.2	30.2
1440	19.2	1.01060	0.0034	1.00720	13.5	0.010285	0.01404	0.0014	23.9	23.9

Seive	mm	% Passing
6"	150	100
3"	75	100.0
2"	50	100.0
1 1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
1/2"	12.5	99.4
3/8"	9.5	99.3
#4	4.75	98.6
#8	2.36	98.0
#10	2.00	97.8
#16	1.18	97.1
#30	0.6	96.1
#40	0.425	95.1
#50	0.3	93.1
#80	0.18	78.2
#100	0.15	73.3
#200	0.075	52.6
	0.0469	48.5
	0.0335	46.1
	0.0215	43.5
	0.0127	37.5
	0.0090	36.8
	0.0064	34.5
	0.0032	30.2
	0.0014	23.9





Project: Mt Taylor Mine Clay Cap & Growth Medium Soil 2020-2021  
 Client: Rio Grande Resource  
 Project Number: 444320-7350000.00  
 Sample Location: 239

### SIEVE ANALYSIS +10 Material

Original Air dry wt 49.9  
 Original dry wt. 48.9

if no +10 enter .1

### HYDROSCOPIC MOISTURE

Weight wet soil (g): 32.49  
 Weight dry soil (g): 32.18  
 Tare Weight (g): 16.50  
 Moisture (%): 2.0%  
 Hygro Moist CF 0.980613  
 Initial dry wt (g): 49.90  
 Cal Dry wt 48.93 for 14.1  
 Cal Dry Weight (g): 48.93 by moisture  
 % of orig Sample 100.06%

### HYDROMETER

2.597 = Specific gravity of soil, (G)

48.93 = Weight soil dispersed (g) corrected for + #10 (W in 14.2)

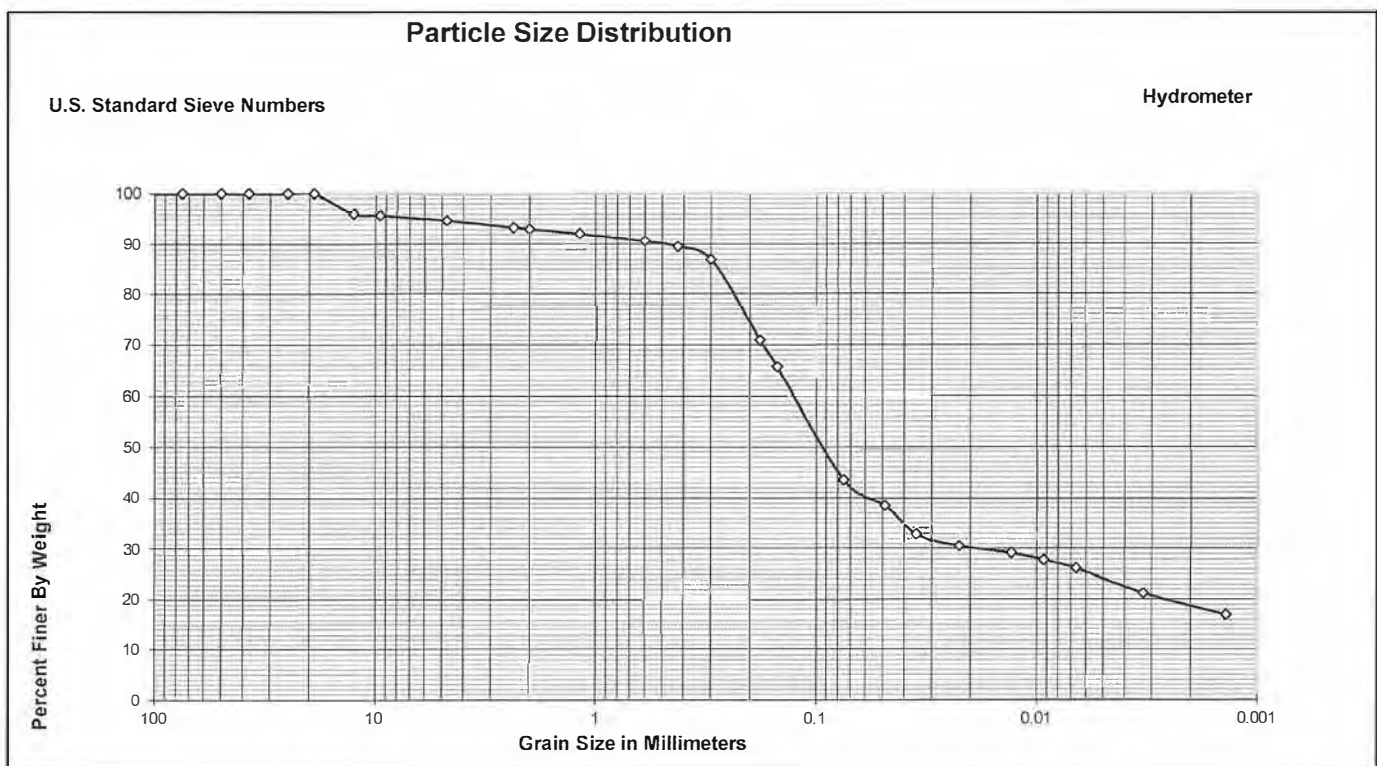
Sieve	Wt Rtn	% passing		
3/4"	0.0	100		
1/2"	0.0	100		
3/8"	0.0	100		
#4	0.0	100		
#8	0.0	100	% rntd	
#10	0.0	100	0.0	
+10	0			Corrected
Sieve	Wt Rtn	Corrected	% passing	% passing
#16	0.1	0.1	99.8	99.8
#30	0.7	0.7	98.6	98.6
#40	1.1	1.1	97.8	97.8
#50	2	2.0	95.9	95.9
#80	9.4	9.4	80.8	80.8
#100	13.8	13.8	71.8	71.8
#200	25.9	25.9	47.1	47.1

correction factor  $p_{11}$

3323

Seive	mm	% Passing
6"	150	100
3"	75	100.0
2"	50	100.0
1 1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
1/2"	12.5	96.1
3/8"	9.5	95.8
#4	4.75	94.8
#8	2.36	93.4
#10	2.00	93.1
#16	1.18	92.2
#30	0.6	90.7
#40	0.425	89.6
#50	0.3	87.0
#80	0.18	70.9
#100	0.15	65.7
#200	0.075	43.5
	0.0487	38.6
	0.0351	32.9
	0.0224	30.6
	0.0130	29.2
	0.0093	27.9
	0.0066	26.3
	0.0033	21.3
	0.0014	16.9

Elapsed time (min)	Temp (C)	Actual Reading	Composite Correction	Corrected Reading R	Effective Depth	Viscosity (n) (poise)	K	Particle Daim (mm) D	Percent Finer	Corrected % passing
1	20.3	1.01500	0.0034	1.01160	12.3	0.010028	0.01386	0.0487	38.6	38.6
2	20.1	1.01330	0.0034	1.00990	12.8	0.010075	0.01390	0.0351	32.9	32.9
5	19.9	1.01260	0.0034	1.00920	13.0	0.010121	0.01393	0.0224	30.6	30.6
15	19.6	1.01220	0.0034	1.00880	13.1	0.010191	0.01398	0.0130	29.2	29.2
30	19.3	1.01180	0.0034	1.00840	13.2	0.010262	0.01402	0.0093	27.9	27.9
60	19.0	1.01130	0.0034	1.00790	13.3	0.010332	0.01407	0.0066	26.3	26.3
250	19.5	1.00980	0.0034	1.00640	13.7	0.010215	0.01399	0.0033	21.3	21.3
1440	19.2	1.00850	0.0034	1.00510	14.0	0.010285	0.01404	0.0014	16.9	16.9



Project: Mt Taylor Mine Clay Cap & Growth Medium Soil 2020-2021  
 Client: Rio Grande Resource  
 Project Number: 444320-7350000.00  
 Sample Location: 243

**SIEVE ANALYSIS +10 Material**

Original Air dry wt 50.13  
 Original dry wt. 49.4

if no +10 enter .1

**HYDROSCOPIC MOISTURE**

Weight wet soil (g): 31.80  
 Weight dry soil (g): 31.57  
 Tare Weight (g): 16.40  
 Moisture (%): 1.5%  
 Hygro Moist CF 0.985065  
 Initial dry wt (g): 50.13  
 Cal Dry wt 49.38 for 14.1  
 Cal Dry Weight (g): 49.38 by moisture  
 % of orig Sample 99.96%

**HYDROMETER**

2.597 = Specific gravity of soil, (G)

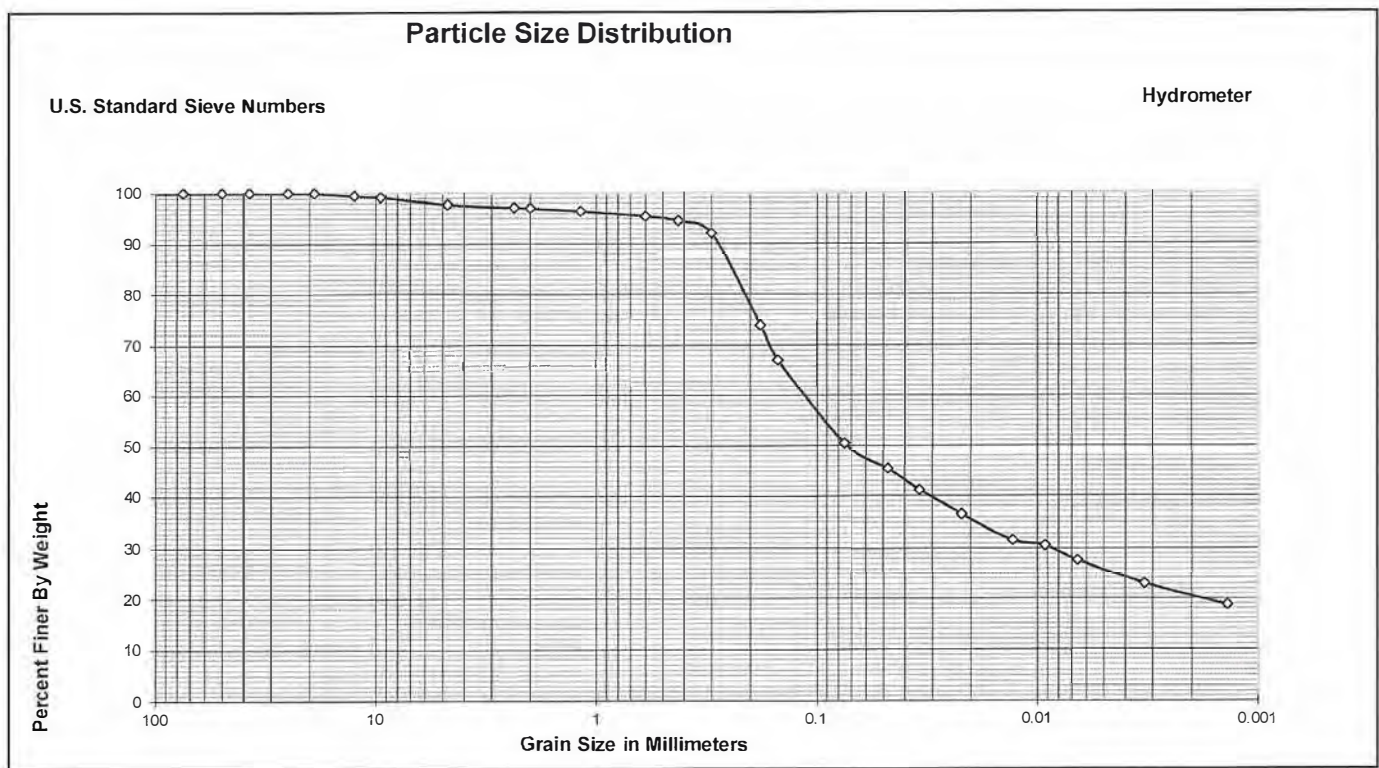
49.38 = Weight soil dispersed (g) corrected for +10 (W in 14.2)

Sieve	Wt Rtn	% passing		
3/4"	0.0	100		
1/2"	0.0	100		
3/8"	0.0	100		
#4	0.0	100		
#8	0.0	100	% rntd	
#10	0.0	100	0.0	
-10	0			Corrected
Sieve	Wt Rtn	Corrected	% passing	% passing
#16	0.4	0.4	99.2	99.2
#30	1	1.0	98.0	98.0
#40	1.4	1.4	97.2	97.2
#50	2.3	2.3	95.3	95.3
#80	9.2	9.2	81.4	81.4
#100	12.7	12.7	74.3	74.3
#200	22.3	22.3	54.8	54.8

Seive	mm	% Passing
6"	150	100
3"	75	100.0
2"	50	100.0
1 1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
1/2"	12.5	99.5
3/8"	9.5	99.2
#4	4.75	97.8
#8	2.36	97.2
#10	2.00	97.1
#16	1.18	96.5
#30	0.6	95.5
#40	0.425	94.6
#50	0.3	92.1
#80	0.18	73.9
#100	0.15	67.2
#200	0.075	50.5
	0.0475	45.4
	0.0341	41.2
	0.0220	36.6
	0.0129	31.6
	0.0092	30.6
	0.0066	27.7
	0.0033	23.1
	0.0022	20.7
	0.0014	18.8

Elapsed time (min)	Temp (C)	Actual Reading	Composite Correction	Corrected Reading R	Effective Depth	Viscosity (n) (poise)	K	Particle Daim (mm) D	Percent Finer	Corrected % passing
1	20.2	1.01720	0.0034	1.01380	11.7	0.010051	0.01388	0.0475	45.4	45.4
2	20.1	1.01590	0.0034	1.01250	12.1	0.010075	0.01390	0.0341	41.2	41.2
5	19.8	1.01450	0.0034	1.01110	12.4	0.010145	0.01394	0.0220	36.6	36.6
15	19.8	1.01300	0.0034	1.00960	12.8	0.010145	0.01394	0.0129	31.6	31.6
30	19.2	1.01270	0.0034	1.00930	12.9	0.010285	0.01404	0.0092	30.6	30.6
60	19.1	1.01180	0.0034	1.00840	13.2	0.010308	0.01406	0.0066	27.7	27.7
250	19.3	1.01040	0.0034	1.00700	13.5	0.010262	0.01402	0.0033	23.1	23.1
1440	19.2	1.00910	0.0034	1.00570	13.9	0.010285	0.01404	0.0014	18.8	18.8

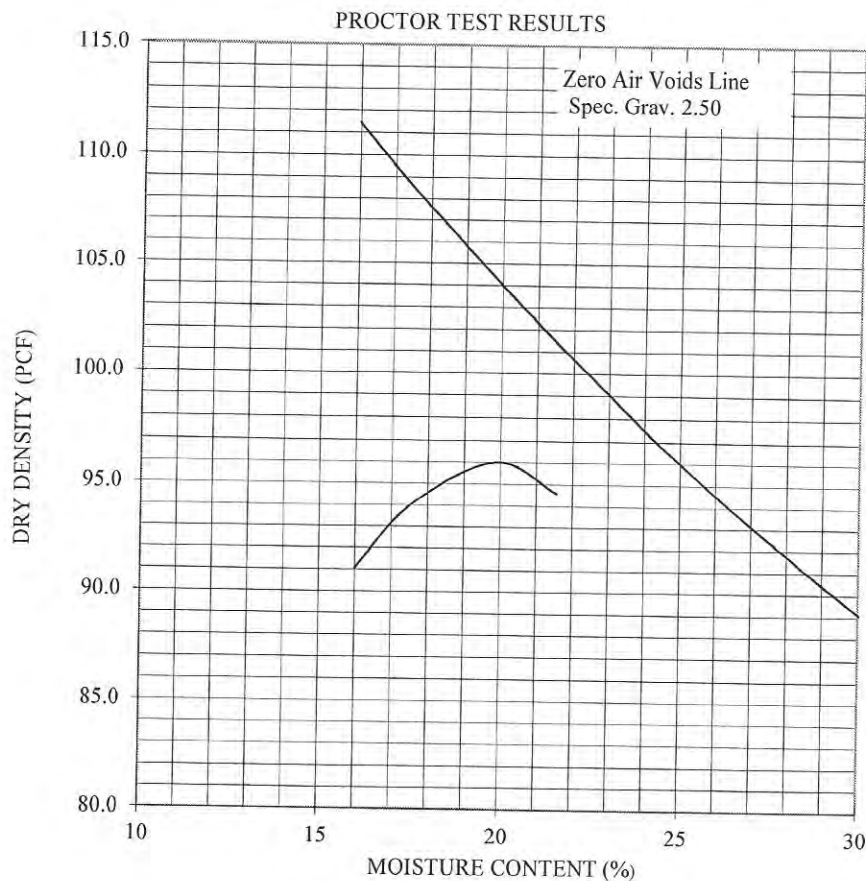




# Soil Classifications - Cover soils used in Disposal Cell Cover , Initial Phase

Sample #	Sieve, % passing				LL	PI	% clay and silt**	% sand	USCS	USDA	Used for
	3/8"	#4	#40	#200							
195	100	99	94	42.5	30	13	42.5	57.5	SC	sandy clay loam	Clay cover
196	100	99	96	44.3	30	12	44.3	55.7	SC	sandy clay loam	Clay cover
197	99	98	95	57.6	28	10	57.6	42.4	CL	sandy clay loam	Clay cover
234	99	99	95	53	35	18	53	47	CL	sandy clay	Growth Medium
239	96	95	90	43	29	12	43	57	SC	sandy clay loam	Growth Medium
243	99	98	95	51	27	9	51	49	CL	sandy clay	Growth Medium
205	100	100	99	84	44	25	84	16	CL	clay	Clay cover
207	96	94	88	44	29	13	44	56	SC	sandy clay loam	Clay cover
208	100	99	96	56	33	17	56	44	CL	sandy clay	Clay cover
213	100	100	97	61	38	21	61	39	CL	sandy clay	Clay cover

## **C.3 Proctor Tests**



Max Dry Density= 96.0 PCF

Optimum Moist.= 19.9 %

Test Method ; ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 10/28/20

Sample No. : 205

Sample Location : East side of borrow area "B" at elevation 7248

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
No. 4	4.75	100	
No. 8	2.36	99	
No. 10	2.00	99	
No. 16	1.18	99	
No. 30	0.60	99	
No. 40	0.425	99	
No. 50	0.300	98	
No. 80	0.180	94	
No. 100	0.150	92	
No. 200	0.075	84	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	44	
PLASTIC LIMIT	19	
PLASTICITY INDEX	25	

ASTM D2487 USCS: CL (Lean CLAY with sand.)

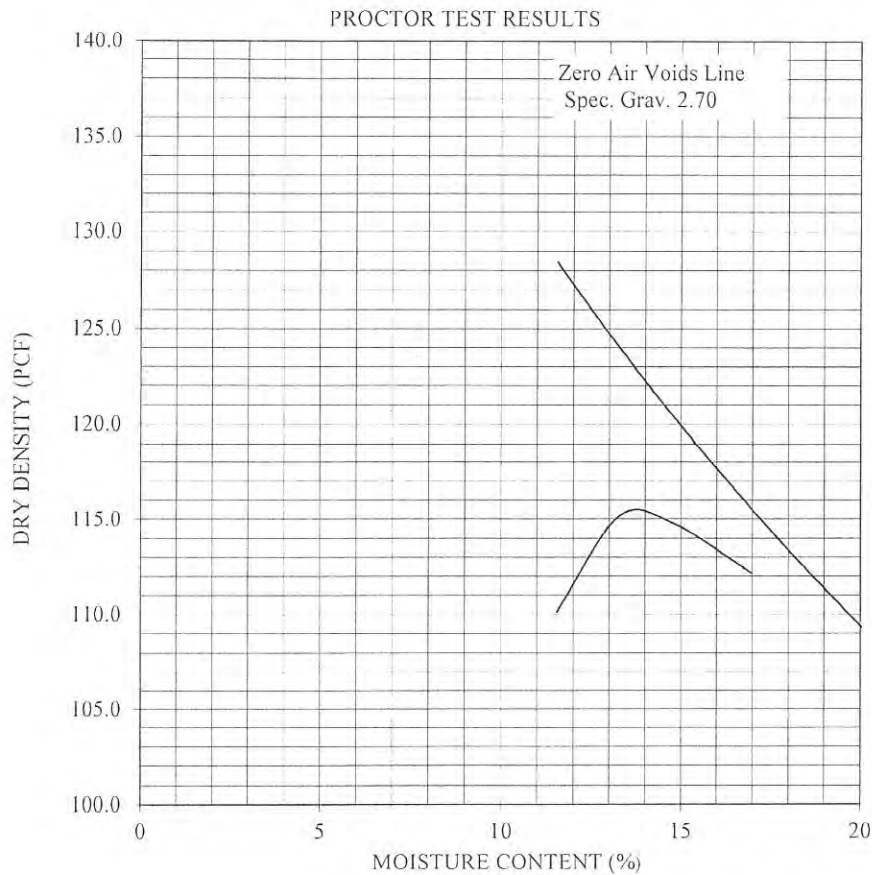
AASHTO M145 CLASS.: A-7-6

EST. R-VALUE: 6  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 1





Max Dry Density= 113.5 PCF

Optimum Moist.= 13.9 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 11/2/20

Sample No. : 207

Sample Location : Stockpile E of disposal cell (middle of stockpile/after processing)

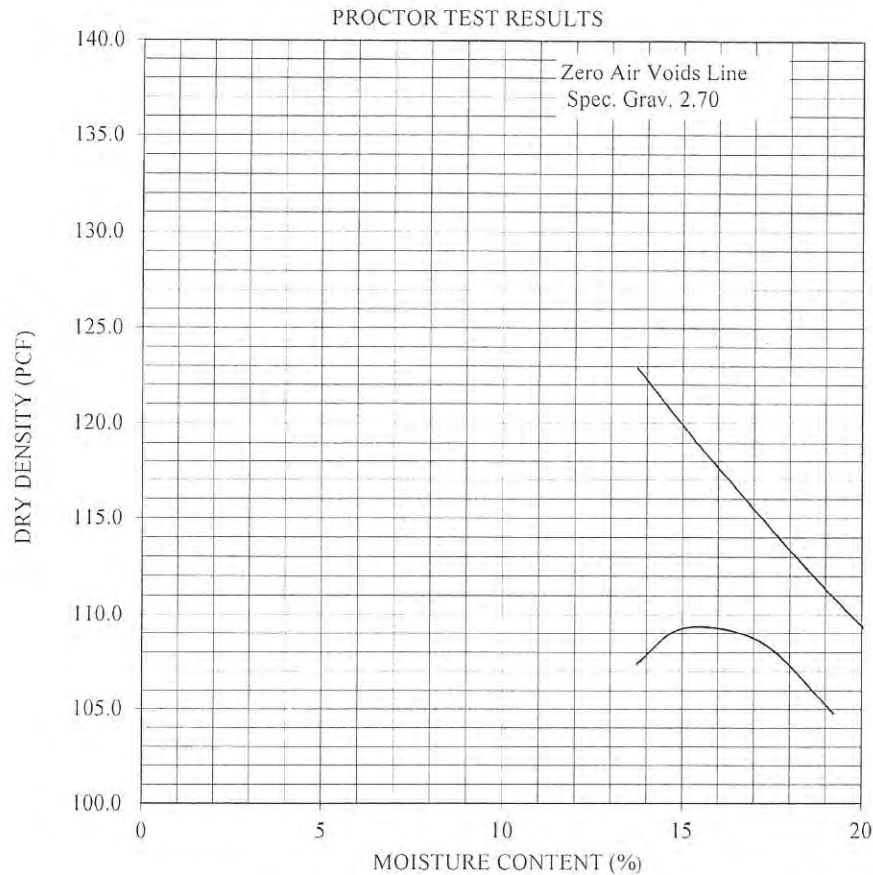
**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0	100	
1/2"	12.5	97	
3/8"	9.5	96	
No. 4	4.75	94	
No. 8	2.36	92	
No. 10	2.00	92	
No. 16	1.18	91	
No. 30	0.60	89	
No. 40	0.425	88	
No. 50	0.300	86	
No. 80	0.180	70	
No. 100	0.150	66	
No. 200	0.075	44	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	29	
PLASTIC LIMIT	16	
PLASTICITY INDEX	13	
ASTM D2487 USCS:	SC	(Clayey SAND.)
AASHTO M145 CLASS.:	A-6	
EST. R-VALUE:	13	
(Based on NMSHTD 97 Charts)		
Specification Used :	None	

Figure: 2



Max Dry Density= 109.3 PCF

Optimum Moist.= 15.1 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 11/2/20

Sample No. : 208

Sample Location : Stockpiles combined N of disposal cell

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	100	
No. 4	4.75	99	
No. 8	2.36	99	
No. 10	2.00	98	
No. 16	1.18	98	
No. 30	0.60	97	
No. 40	0.425	96	
No. 50	0.300	94	
No. 80	0.180	79	
No. 100	0.150	75	
No. 200	0.075	56	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	33	
PLASTIC LIMIT	16	
PLASTICITY INDEX	17	

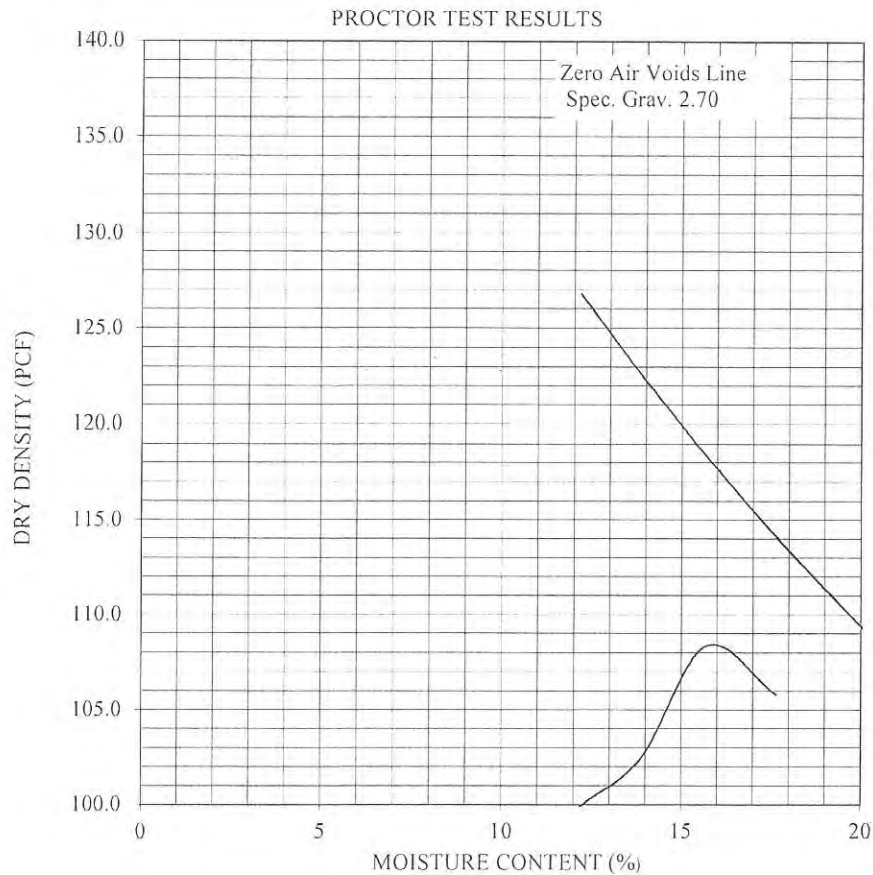
ASTM D2487 USCS: CL (Sandy lean CLAY.)

AASHTO M145 CLASS: A-6

EST. R-VALUE: 11  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 3



Max Dry Density= 108.4 PCF

Optimum Moist.= 15.7 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 11/5/20

Sample No. : 213

Sample Location : Clay cover stockpile from borrow area "A"

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
No. 4	4.75	100	
No. 8	2.36	99	
No. 10	2.00	99	
No. 16	1.18	99	
No. 30	0.60	98	
No. 40	0.425	97	
No. 50	0.300	95	
No. 80	0.180	82	
No. 100	0.150	79	
No. 200	0.075	61	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	38	
PLASTIC LIMIT	17	
PLASTICITY INDEX	21	

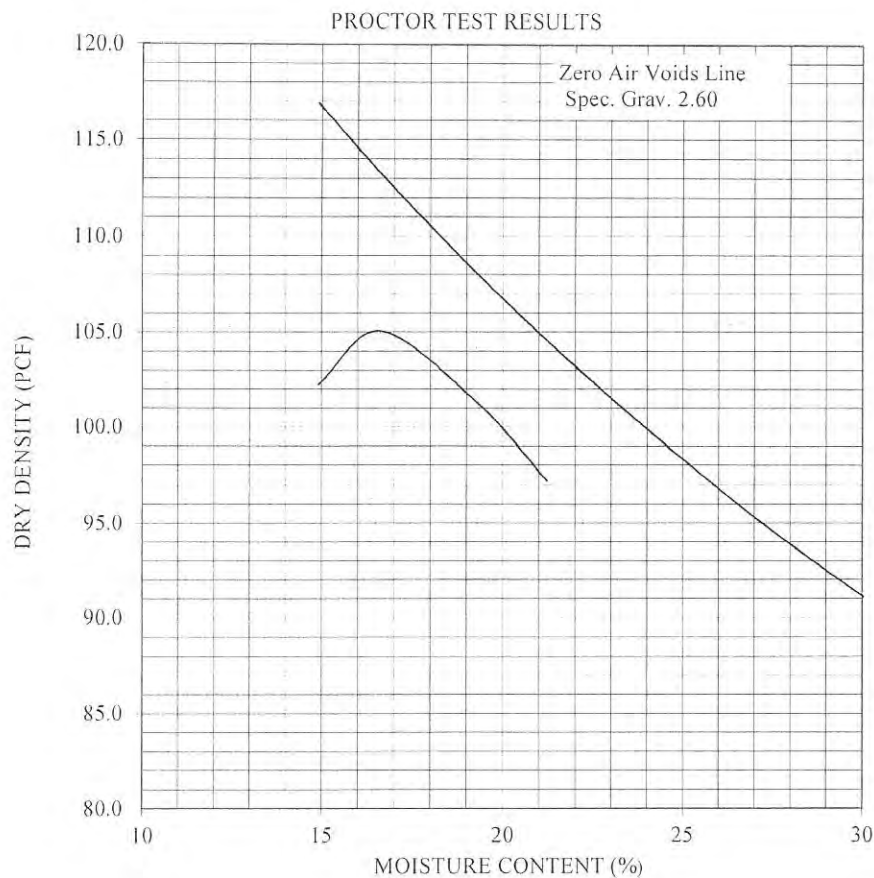
ASTM D2487 USCS: CL (Sandy lean CLAY.)

AASHTO M145 CLASS.: A-6

EST. R-VALUE: 9  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 4



Max Dry Density= 105.0 PCF

Optimum Moist.= 16.5 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 12/1/20

Sample No. : 234

Sample Location : Growth Media from borrow area "A"

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0	100	
1/2"	12.5	99	
3/8"	9.5	99	
No. 4	4.75	99	
No. 8	2.36	98	
No. 10	2.00	98	
No. 16	1.18	97	
No. 30	0.60	96	
No. 40	0.425	95	
No. 50	0.300	93	
No. 80	0.180	78	
No. 100	0.150	73	
No. 200	0.075	53	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	35	
PLASTIC LIMIT	17	
PLASTICITY INDEX	18	

USDA TEXTURAL CLASSIFICATION: Sandy Clay Loam

ASTM D2487 USCS: CL (Sandy lean CLAY.)

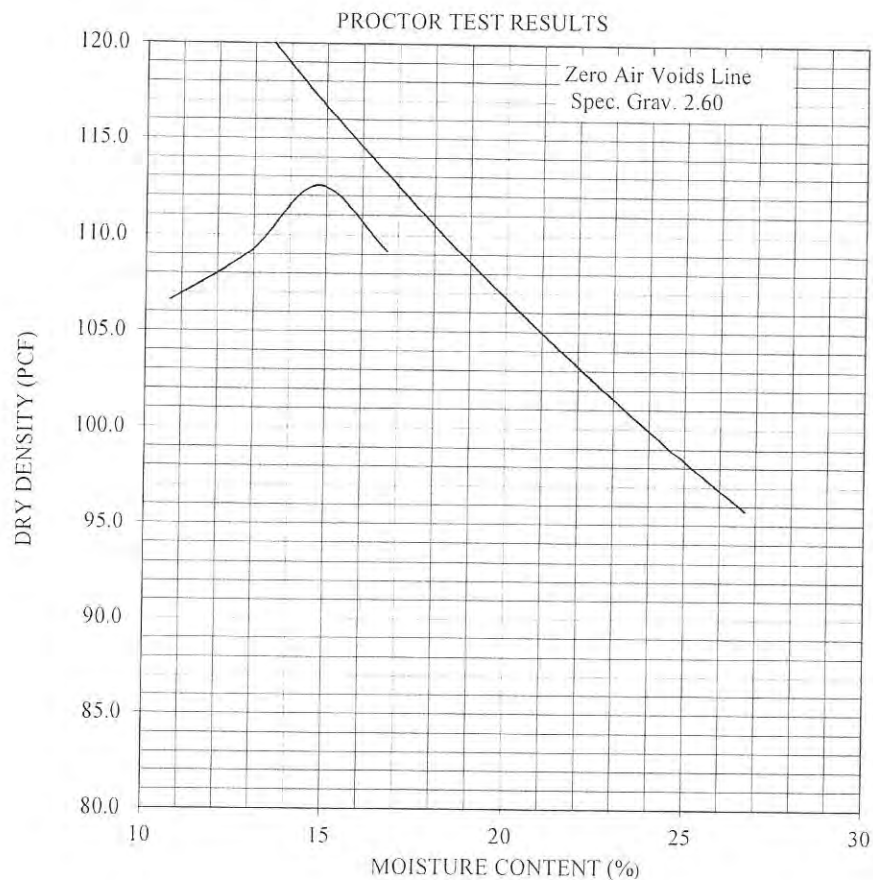
AASHTO M145 CLASS.: A-6

EST. R-VALUE: 10  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 5





Max Dry Density= 112.5 PCF

Optimum Moist.= 14.8 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 12/8/20

Sample No. : 239

Sample Location : Excavated material from borrow area 'A' for growth media

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5	100	
1"	25.0	96	
3/4"	19.0	96	
1/2"	12.5	96	
3/8"	9.5	96	
No. 4	4.75	95	
No. 8	2.36	93	
No. 10	2.00	93	
No. 16	1.18	92	
No. 30	0.60	91	
No. 40	0.425	90	
No. 50	0.300	87	
No. 80	0.180	71	
No. 100	0.150	66	
No. 200	0.075	43	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	29	
PLASTIC LIMIT	17	
PLASTICITY INDEX	12	

USDA TEXTURAL CLASSIFICATION: Sandy Clay Loam

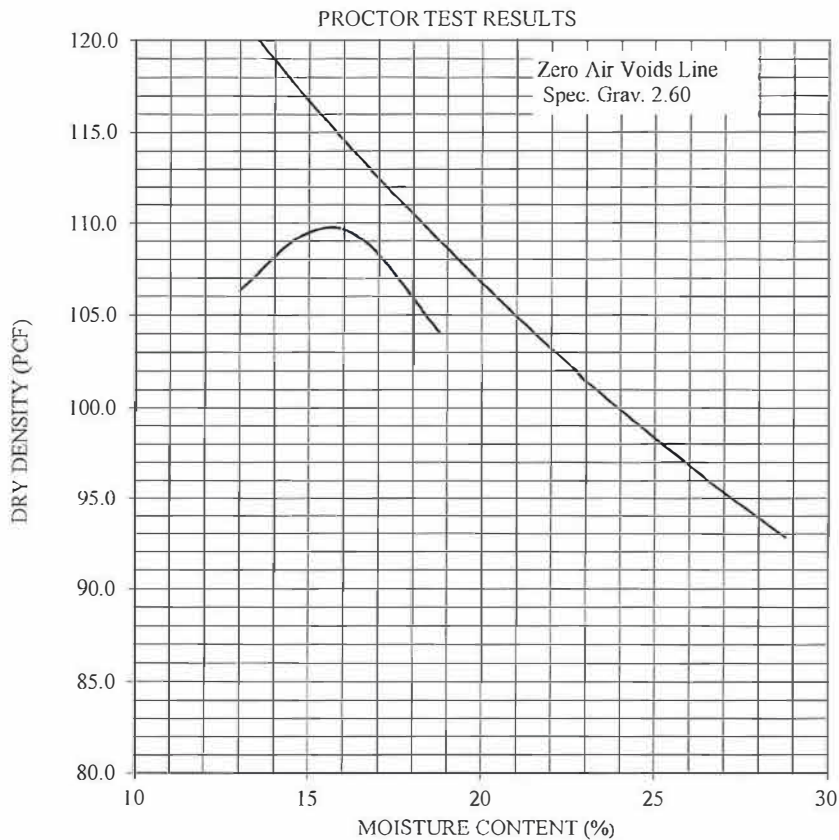
ASTM D2487 USCS: SC (Clayey SAND.)

AASHTO M145 CLASS.: A-6

EST. R-VALUE: 13  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 5



Max Dry Density= 109.8 PCF

Optimum Moist.= 15.8 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 12/11/20

Sample No. : 243

Sample Location : Growth media from borrow area "A", (Lower west slope/north)

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5	100	
3/8"	9.5	99	
No. 4	4.75	98	
No. 8	2.36	97	
No. 10	2.00	97	
No. 16	1.18	97	
No. 30	0.60	96	
No. 40	0.425	95	
No. 50	0.300	92	
No. 80	0.180	74	
No. 100	0.150	67	
No. 200	0.075	51	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	27	
PLASTIC LIMIT	18	
PLASTICITY INDEX	9	

USDA TEXTURAL CLASSIFICATION: Sandy Clay Loam

ASTM D2487 USCS: CL (Sandy lean CLAY.)

AASHTO M145 CLASS.: A-4

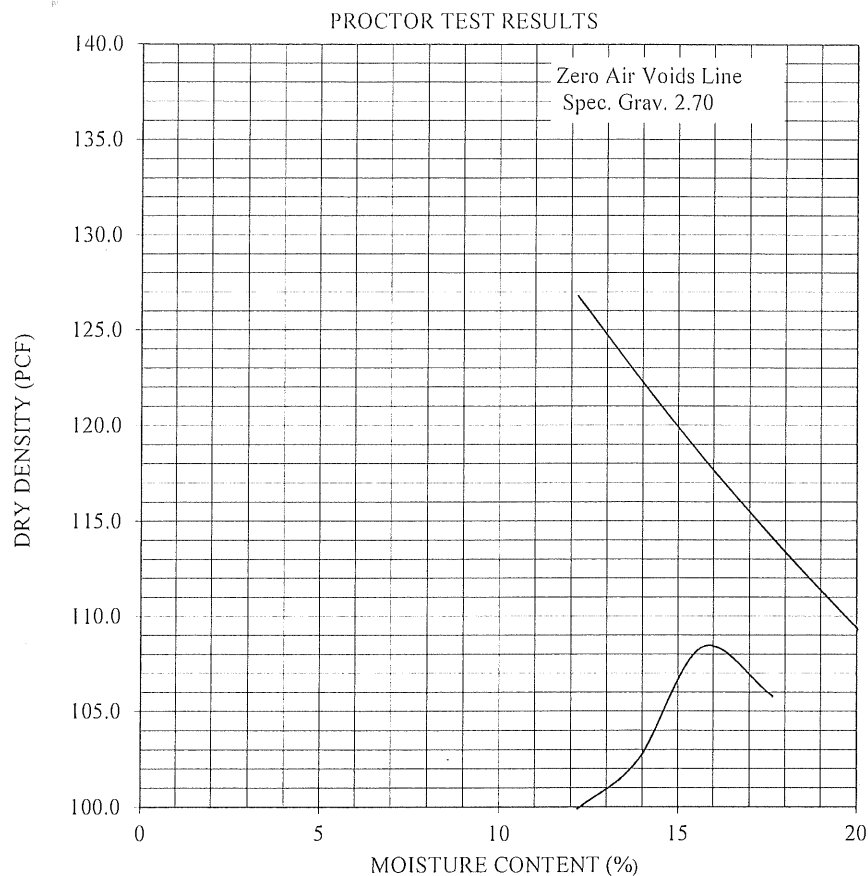
EST. R-VALUE: 23  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 6

# Mt. Taylor Mine Clay Cover

#20-213 Clay Cover Stockpile from Borrow Area "A"



Max Dry Density= 108.4 PCF

Optimum Moist.= 15.7 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 11/5/20

Sample No. : 213

Sample Location : Clay cover stockpile from borrow area "A"

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
No. 4	4.75	100	
No. 8	2.36	99	
No. 10	2.00	99	
No. 16	1.18	99	
No. 30	0.60	98	
No. 40	0.425	97	
No. 50	0.300	95	
No. 80	0.180	82	
No. 100	0.150	79	
No. 200	0.075	61	

**Atterberg Limits ASTM D4318**

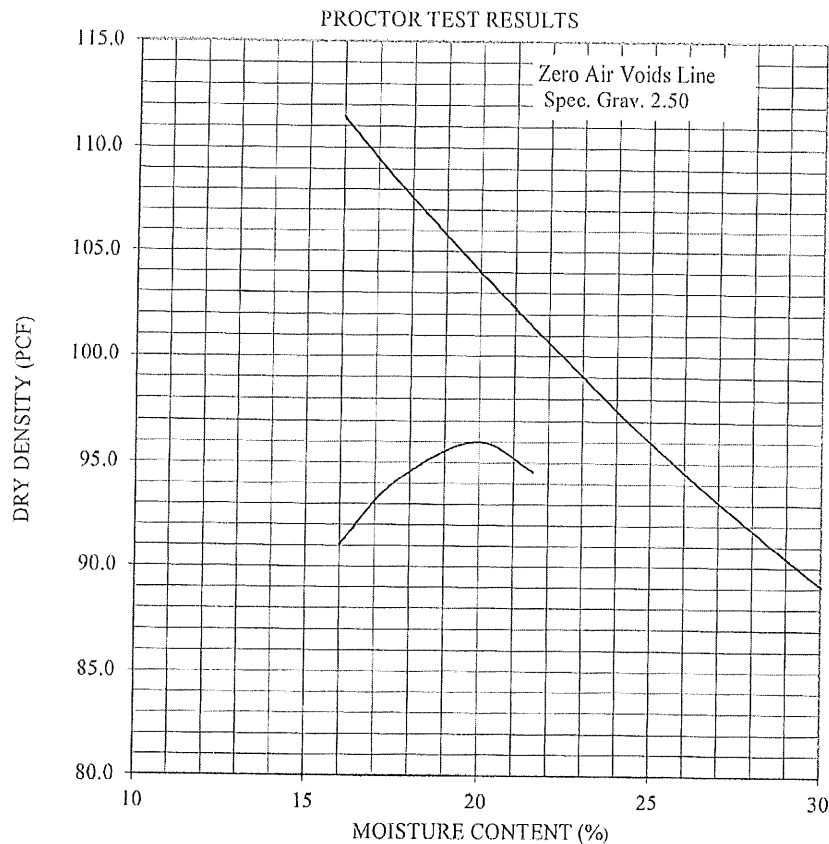
	Results	Spec.
LIQUID LIMIT	38	
PLASTIC LIMIT	17	
PLASTICITY INDEX	21	
ASTM D2487 USCS:	CL	(Sandy lean CLAY.)
AASHTO M145 CLASS.:	A-6	
EST. R-VALUE:	9	
(Based on NMSHTD 97 Charts)		
Specification Used :	None	

Figure: 4



# Mt. Taylor Mine Clay Cover

#20-205 East side of Borrow area "B" at Elevation 7248



Max Dry Density= 96.0 PCF

Optimum Moist.= 19.9 %

Test Method : ASTM D698-A

Method: Manual Hammer

NV5 Project No.: 444320-7350000.00

COA Number:

Project Title : Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled : 10/28/20

Sample No. : 205

Sample Location : East side of borrow area "B" at elevation 7248

**Sieve Analysis ASTM C-136**

Sieve	mm	% Passing	Spec.
3"	75.0		
2"	50.0		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
No. 4	4.75	100	
No. 8	2.36	99	
No. 10	2.00	99	
No. 16	1.18	99	
No. 30	0.60	99	
No. 40	0.425	99	
No. 50	0.300	98	
No. 80	0.180	94	
No. 100	0.150	92	
No. 200	0.075	84	

**Atterberg Limits ASTM D4318**

	Results	Spec.
LIQUID LIMIT	44	
PLASTIC LIMIT	19	
PLASTICITY INDEX	25	

ASTM D2487 USCS: CL (Lean CLAY with sand.)

AASHTO M145 CLASS.: A-7-6

EST. R-VALUE: 6  
(Based on NMSHTD 97 Charts)

Specification Used : None

Figure: 1

## **C.4 Hydraulic Properties**



## Summary of Saturated Hydraulic Conductivity Tests

Sample Number	$K_{sat}$ (cm/sec)	Oversize Corrected $K_{sat}$ (cm/sec)	Method of Analysis	
			Constant Head Flexible Wall	Falling Head Flexible Wall
BP16-1 (95%)	3.0E-06	---		X
BP16-3 (95%)	6.6E-06	---		X
BP16-5 (95%)	5.2E-06	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass  
NR = Not requested  
NA = Not applicable





## Summary of Saturated Hydraulic Conductivity Tests

Sample Number	$K_{sat}$ (cm/sec)	Oversize Corrected $K_{sat}$ (cm/sec)	Method of Analysis	
			Constant Head Flexible Wall	Falling Head Flexible Wall
MT18-4 (95%)	4.4E-05	---		X
MT18-5 (95%)	1.6E-07	---		X
MT18-6 (95%)	2.3E-05	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NR = Not requested

NA = Not applicable



*Daniel B. Stephens & Associates, Inc.*

### Summary of Saturated Hydraulic Conductivity Tests

Sample Number	$K_{sat}$ (cm/sec)	Oversize Corrected $K_{sat}$ (cm/sec)	Method of Analysis	
			Constant Head	Falling Head
19-104 (1.48 g/cc)	9.2E-06	NA		X
19-105 (1.52 g/cc)	2.8E-06	NA		X
19-110 (1.48 g/cc)	4.7E-06	NA		X
19-114 (1.54 g/cc)	8.3E-07	NA		X



## Summary of Saturated Hydraulic Conductivity Tests

Sample Number	$K_{sat}$ (cm/sec)	Oversize Corrected $K_{sat}$ (cm/sec)	Method of Analysis	
			Constant Head Flexible Wall	Falling Head Flexible Wall
Borrow A (90%)	8.7E-05	NA		X
Borrow B (90%)	4.4E-04	NA		X

---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass  
 NR = Not requested  
 NA = Not applicable

## **C.5 Compaction Tests**

### Densities/Moisture Tests for Phase 3 Construction

11/26/19



## Summary of Densities for Clay Cover (2020-2021)

Densities/Moisture Tests for Phase 3 Construction

Date	Test #	Location	In-place Densities Results				ASTM TEST			
							D2487	D4318	D698	D698
			Elev.	Ydry	W%	Sample #	Class.	PI	Max. Y	Opt M %
11/4/20	1	Clay Cover(1st lift) @70'E/4'N of CP at SW corner of Disp.C	7367.4	109.2	13.6	20-208	CL	17	109.3	151
		35°20'14N/107°38'10W ( Upper South Slope)	-1.5' FSG							
11/4/20	2	Clay Cover(1st lift) @120'E/90'N of CP at SW corner of Disp.C	7377.7	105.7	15.6	20-208	CL	17	109.3	151
		35°20'15N/107°38'09W ( Upper South Slope)	-1.5' FSG							
11/4/20	3	Clay Cover(1st lift) @ 210'E/60'W of CP	7373.9	107.2	13.1	20-208	CL	17	109.3	151
		35°20'14N/107°38'09W ( Upper South Slope)	-1.5' FSG							
11/5/20	4	Clay Cover(1st lift) @ 180'N/30'E of CP	7364.6	109.0	18	20-208	CL	17	109.3	151
		35°20'16N/107°38'10W (Upper West Slope)	-1.5' FSG							
11/5/20	5	Clay Cover(1st lift) @ 140'N/120'E of CP	7377.1	103.5	17.8	20-208	CL	17	109.3	151
		35°20'15N/107°38'10W (Upper West Slope)	-1.5' FSG							
11/5/5/20	6	Clay Cover(1st lift) @ 90'N/120' E of CP	7365.2	104.9	16.1	20-208	CL	17	109.3	151
		35°20'15N/107°38'10W (Upper West Slope)	-1.5' FSG							
11/6/20	7	Clay Cover(1st lift) @ 180'N/150'E of CP	7378.7	106.5	16.5	20-208	SC	13	113.5	139
		35°20'15N/107°38'10W (Upper North Slope)	-1.5' FSG							
11/6/20	8	Clay Cover(1st Lift) @ 230'N/150'E of CP	7378.6	109.8	16.3	20-207	SC	13	113.5	139
		35°20'16N/107°38'09W (Upper North Slope)	-1.5' FSG							
11/6/20	9	Clay Cover (2nd lift) @ 120'N/120'E of CP	7383	106.5	15.7	20-207	SC	13	113.5	139
		35°20'15N/107°38'09W (Upper South Slope)	-1' FSG							
11/6/20	10	Clay Cover(2nd lift) @ 150'N/40'E of CP	7367.9	104.9	14.3	20-207	SC	13	113.5	139
		35°20'15N/107°38'10W (Upper West Slope)	-1' FSG							
11/6/20	11	Clay Cover (2nd lift) @ 100'N/150'E of CP	7378.6	106.6	14.9	20-207	SC	13	113.5	139
		35°20'16N/107°38'09W (Upper West Slope)	-1' FSG							
11/6/20	12	Clay Cover(2nd lift) @ 120'N/35'E of CP	7363.2	105.2	13.9	20-207	SC	13	113.5	139
		35°20'15N/107°38'11W (Upper West Slope)	-1' FSG							

12/22/20

## Summary of Densities for Clay Cover (2020-2021)

Densities/Moisture Tests for Phase 3 Construction

Date	Test #	Location	Elev.	Ydry	W%	Sample #	ASTM TEST			
							In-place Densities Results			
							D2487	D4318	D698	D698
							Class.	PI	Max. Y	Opt M %
11/10/20	13	Clay Cover(3rd lift) @ 170'N/50' E of CP	7365.9	101.9	18.1	20-207	CL	17	113.5	139
		(Upper West Slope)	-.5' FSG							
11/10/20	14	Clay Cover(3rd lift) @ 100'N/35' E of CP	7368.3	104	16.5	20-207	CL	17	113.5	139
		(Upper West Slope)	-.5' FSG							
11/10/20	15	Clay Cover(4th lift) @ 120'E/70'N of CP	7371.9	103.7	17.03	20-207	CL	17	113.5	139
		(Upper South Slope)	FSG							
11/10/20	16	Clay Cover(4th lift) @ 180'E/40'N of CP	7369.5	104.9	18.1	20-207	CL	17	113.5	139
		(Upper South Slope)	FSG							
11/11/20	17	Clay Cover (4th lift) @ 70'N of CP	7369.1	112.7	18.1	20-208	CL	17	109.3	151
		Upper West Slope)	FSG							
11/11/20	18	Clay Cover (4th lift) @ 110'N of CP	7363.5	114.9	17.8	20-208	CL	17	109.3	151
		Upper West Slope)	FSG							
11/11/20	19	Clay Cover (4th lift) @ 100'N of CP	7362.6	108.2	21.7	20-208	CL	17	109.3	151
		(Upper West Slope)	FSG							
11/11/20	20	Clay Cover (4th lift) @ 150'N of CP	7371.5	109.8	16.7	20-208	CL	17	109.3	151
		(Uppper West Slope)	FSG							
11/11/20	21	Clay Cover (4th lift) @ 120'N of CP	7368	114.1	17.1	20-208	CL	17	109.3	151
		(Upper West Slope)	FSG							
11/11/20	22	Clay Cover (4th lift) @ 275' E of W edge at STA 6+10	7361	103.5	18.4	20-208	CL	17	109.3	151
		(Upper North Slope)	FSG							
11/11/20	23	Clay Cover (4th lift) @ 210'E of W edge at STA 6+20	7365.4	109.4	19	20-208	CL	17	109.3	151
		Upper North Slope)	FSG							
11/11/20	24	Clay Cover (4th lift) @ 160'E of W edge at STA 6+75	7372.7	108.8	18.1	20-208	CL	17	109.3	151
		(Upper North Slope)	FSG							

12/22/20

## Summary of Densities for Clay Cover (2020-2021)

Densities/Moisture Tests for Phase 3 Construction

Date	Test #	Location	Elev.	Ydry	W%	Sample #	ASTM TEST			
							In-place Densities Results			
							D2487	D4318	D698	D698
							Class.	PI	Max. Y	Opt M %
11/11/20	25	Clay Cover(4th lift) @ 115'E of W Edge at STA 6+00	7375	103.8	18.6	20-208	CL	17	109.3	151
		(Upper North Slope)	FSG							
11/17/20	26	Clay Cover(1st lift) @ 325'N/80'E of CP	7367.9	99.3	18.4	20-213	CL	21	108.4	157
		(Southside of Upper N Slopes)	-1.5' FSG							
11/17/20	27	Clay Cover (1st lift) @420'N/60'E of CP	7361.1	99.9	17.7	20-213	CL	21	108.4	157
		(Westside of Upper N Slopes)	-1.5' FSG							
11/17/20	28	Clay Cover (1st lift) @ 480'N/140'E of CP	7356.7	103.6	18.6	20-213	CL	21	108.4	157
		(Northside of Upper N Slopes)	-1.5' FSG							
11/17/20	29	Clay Cover (1st lift) @ 420'N/240'E of CP	7354	102.9	18.7	20-213	CL	21	108.4	157
		(Northside of Upper N Slopes)	-1.5' FSG							
11/19/20	30	Clay Cover (1st lift) @ 170'E of Center of Drain Chan. STAS+00	7359.6	104.7	23.4	20-205	CL	25	96	199
		(Upper North Slope/Lower Ramp)	-1.5' FSG							
11/19/20	31	Clay Cover (2nd lift) @ 220'E of Center of Drain Chan. STA 4+00	7350.2	101	24.8	20-205	CL	25	96	199
		(Upper North Slope/Lower Ramp)	-1' FSG							
11/19/20	32	Clay Cover (2nd lift) @ 180'E of Center of Drain Chan. STA 3+75	7345.8	103.7	24.6	20-205	CL	25	96	199
		(Upper North Slope/Lower Ramp)	-1' FSG							
11/19/20	33	Clay Cover (2nd lift) @ 250'E of Center of Drain Chan. STA 3+00	7350.3	103.2	24.6	20-205	CL	25	96	199
		(Upper North Slope/Lower Ramp)	-1' FSG							
11/19/20	34	Clay Cover(2nd lift) @ 200'E of Drain Chan. Sta 3+50	7350.8	105.6	23.3	20-205	CL	25	96	199
		(Upper North Slope/Lower Ramp)	-1'FSG							
11/19/20	35	Clay Cover (2nd lift) @ 40'E pf Center of Drain Chan. STA 1+50	7347	101.9	22.2	20-205	CL	25	96	199
		(Upper N Slope/Upper Ramp)	-1' FSG							
11/19/20	36	Clay Cover (2nd lift) @ 30'E of Center of Drain Chan. STA 1+30	7347.1	102.5	21.7	20-205	CL	25	96	199
		(Upper N Slope/Upper Ramp)								

12/22/20

### Densities/Moisture Tests for Phase 3 Construction

12/22/20

# COMPACTION TEST RESULTS

PROJECT : Mt. Taylor Mine Clay Cap & Growth Medium Soil CLIENT: Rio Grande Resources Corporation  
 2020-2021 - San Mateo, NM TECHNICIAN: Geoffrey Juskiewicz  
 PROJECT NO.: 444320-7350000.00 REPORT NO.: 5 DATE: 11/11/20  
 COA PROJECT NO.:

Test No.	Location	Elevation	Proctor Number	Field Moisture (%)	Field Dry Density (pcf)	Relative Compaction (%)	Specified Compaction (%)
17	Clay cover upper west slope, fourth lift 70' N of CP at SW corner	7375 FSG	2	18.1	112.7	99	90
18	Clay cover upper west slope, fourth lift 110' N of CP at SW corner	7384 FSG	2	17.8	114.9	101	90
19	Clay cover upper west slope, fourth lift 100' N of CP at SW corner	7376 FSG	2	21.7	108.2	95	90
20	Clay cover upper west slope, fourth lift 150' N of CP at SW corner	7368 FSG	2	16.7	109.8	97	90
21	Clay cover upper west slope 120' N of CP at SW corner	7388 FSG	2	17.1	114.1	101	90
22	Clay cover upper north slope 275' E of W edge @ sta 6+10	7370 FSG	2	18.4	103.5	91	90
23	Clay cover upper north slope 210' E of W edge @ sta 6+20	7380 FSG	2	19.0	109.4	96	90
24	Clay cover upper north slope 160' E of W edge @ sta 6+75	7388 FSG	2	18.1	108.8	96	90
25	Clay cover upper north slope 110' E of W edge @ sta 6+00	7375 FSG	2	18.6	103.8	91	90

## Proctor Test Utilized

Proctor No.	Sample Location	Opt. Moisture Content (%)	Maximum Dry Dens (pcf)	Soil Description
2	Stockpile E of disposal cell (middle of stockpile/after processine) (20-207)	13.9	113.5	Clayey SAND

WEATHER: Partly cloudy, breezy, cold

EQUIPMENT: 2 rock trucks, blade, dozer, water truck

REMARKS: Contracting personnel informed of the test results.



## COMPACTION TEST RESULTS

PROJECT : Mt. Taylor Mine Clay Cap & Growth Medium Soil CLIENT: Rio Grande Resources Corporation  
2020-2021 - San Mateo, NM TECHNICIAN: Joe Deans  
PROJECT NO.: 444320-7350000.00 REPORT NO.: 6 DATE: 11/17/20  
COA PROJECT NO.: \_\_\_\_\_

Test No.	Location	Elevation	Proctor Number	Field Moisture (%)	Field Dry Density (PCF)	Relative Compaction (%)	Specified Compaction (%)
26	Clay cover on south side of lower north slopes (1st lift) at 325' N x 80' E of CP	7367.9 -1.5' FSG	4	18.4	99.3	92	90
27	Clay cover on Westside of lower N slopes (1st lifts) at 420' N x 60' E of CP	7361.1 -1.5' FSG	4	17.7	99.9	92	90
28	Clay cover on north side of lower N slopes (1st lift) at 480' N x 140' E of CP	7356.7 -1.5' FSG	4	18.6	103.6	96	90
29	Clay cover on N side of lower N slopes (1st lift) 420' N x 240' E of CP	7354 -1.5' FSG	4	18.7	102.9	95	90

Proctor Test Utilized				
Proctor No.	Sample Location	Opt. Moisture Content (%)	Maximum Dry Dens (pcf)	Soil Description
4	Clay cover stockpile from borrow area "A" (20-213)	15.7	108.4	Sandy lean CLAY

WEATHER: Clear, warm

**EQUIPMENT:** Dozer, blade, excavator, water truck

REMARKS: Contracting personnel informed of the test results.

# COMPACTION TEST RESULTS

PROJECT: Mt. Taylor Mine Clay Cap & Growth Medium Soil      CLIENT: Rio Grande Resources Corporation  
 2020-2021 - San Mateo, NM      TECHNICIAN: Technician  
 PROJECT NO.: 444320-7350000.00      REPORT NO.: 7      DATE: Geoffrey Juskiewicz  
 COA PROJECT NO.: \_\_\_\_\_

Test No.	Location	Elevation	Proctor Number	Field Moisture (%)	Field Dry Density (pcf)	Relative Compaction (%)	Specified Compaction (%)
30	Clay layer upper north slope 170' E of center of drainage channel @ sta 5+00 lower ramp	7367 1st lift	1	23.4	104.7	109	90
31	Clay layer upper north slope 220' E of center of drainage channel @ sta 4+00 lower ramp	7354 2nd lift	1	24.8	101.0	105	90
32	Clay layer upper north slope 180' E of center of drainage channel @ sta 3+70 lower ramp	7350 2nd lift	1	24.6	103.7	108	90
33	Clay layer upper north slope 250' E of center of drainage channel @ sta 3+00 lower ramp	7348 2nd lift	1	24.6	103.2	108	90
34	Clay layer upper north slope 200' E of center of drainage channel @ sta 3+50 lower ramp	7346 2nd lift	1	23.3	105.6	110	90
35	Clay layer upper north slope 40' E of center of drainage channel @ sta 1+50 upper ramp	7366 2nd lift	1	22.2	101.9	106	90
36	Clay layer upper north slope 30' E of center of drainage channel @ sta 1+30 upper ramp	7362 2nd lift	1	21.7	102.5	107	90
37	Clay layer upper north slope 200' E of center of drainage channel @ sta 5+00 lower ramp	7367 2nd lift	1	21.0	104.7	109	90

## Proctor Test Utilized

Proctor No.	Sample Location	Opt. Moisture Content (%)	Maximum Dry Dens (pcf)	Soil Description
1	East side of borrow area "B" at elevation 7248 (20-205)	19.9	96.0	Lean CLAY with sand

WEATHER: Windy, sunny

EQUIPMENT: Dozer, blade, water trucks, 2 rock trucks

REMARKS: Contracting personnel informed of the test results.

# COMPACTION TEST RESULTS

PROJECT : Mt. Taylor Mine Clay Cap & Growth Medium Soil      CLIENT: Rio Grande Resources Corporation  
 2020-2021 - San Mateo, NM      TECHNICIAN: Joe Deans  
 PROJECT NO.: 444320-7350000.00      REPORT NO.: 8      DATE: 11/25/20  
 COA PROJECT NO.: \_\_\_\_\_

Test No.	Location	Elevation	Proctor Number	Field Moisture (%)	Field Dry Density (pcf)	Relative Compaction (%)	Specified Compaction (%)
38	Clay cover (final lift) upper south slope 160' E x 55' N of CP	7376 FSG	1	20.5	95.9	100	90
39	Clay cover (final lift) upper west slope 140' N x 80' E of CP	7375 FSG	1	21.7	93.1	97	90
40	Clay cover (final lift) upper north slope 180' N x 140' E of CP	7386 FSG	1	21.9	92.3	96	90
41	Clay cover (final lift) lower north slope 480' N x 100' E of CP	7356 FSG	1	22.1	90.3	94	90
42	Clay cover (final lift) lower north slope 400' N x 240' E of CP	7360 FSG	1	19.0	91.5	95	90

## Proctor Test Utilized

Proctor No.	Sample Location	Opt. Moisture Content (%)	Maximum Dry Dens (pcf)	Soil Description
1	East side of borrow area "B" at elevation 7248 (20-205)	19.9	96.0	Lean CLAY with sand

WEATHER: Clear, warm

EQUIPMENT: Dozers, front loader, water truck, end dumps

REMARKS: Contracting personnel informed of the test results.

## **C.6 Riprap Tests**

Client: Rio Grande Resources Corporation

Project Number: 444320-7350000.00

Project: Mt. Taylor Mine Clay Cap & Growth Medium Soil 2020-2021 - San Mateo, NM

Date Sampled: 11/18/20      Sample Number: 1

Location: Stockpiled 4-8" Rip Rap Material

**Sieve Analysis Test Results**

ASTM D422

<b>Sieve Size</b>	<b>% Passing By Weight</b>	<b>Specs</b>	<b>Specs</b>
8"	5		
4"	84		
1 1/2"	11		