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

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: Pikeview Quarry	**MINE/PROSPECTING ID#:** M-1977-211	**MINERAL:** Limestone (general), granite gneiss and do	**COUNTY:** El Paso
INSPECTION TYPE: Monitoring	**WEATHER:** Clear	**INSP. DATE:** August 29, 2024	**INSP. TIME:** 10:00
OPERATOR: Riverbend Industries Inc.	**OPERATOR REPRESENTATIVE:** Jerry Schnabel	**TYPE OF OPERATION:** 112c - Construction Regular Operation	
REASON FOR INSPECTION: Normal I&E Program	**BOND CALCULATION TYPE:** None	**BOND AMOUNT:** $6,805,607.00	
DATE OF COMPLAINT: NA	**POST INSP. CONTACTS:** None	**JOINT INSP. AGENCY:** None	
INSPECTOR(S): Hunter Ridley	**INSPECTOR'S SIGNATURE:** Hunter Ridley	**SIGNATURE DATE:** September 5, 2024	

GENERAL INSPECTION TOPICS

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

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

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

OBSERVATIONS

This inspection was conducted by Hunter Ridley with the Division of Reclamation, Mining and Safety (Division) as part of the continuing planned monthly inspections to observe the backfill placement for the final reclamation of the Pikeview Quarry. As backfill placement has ceased, monthly inspections have continued to observe final grading and revegetation efforts. Jerry Schnabel (representing the Permittee, Riverbend Industries Inc.) and Stantec representative Paul Kos were present for the inspection. USFS representatives Cullen Lapointe, Julie Spawn, Madison Banks, and Cait Woods were also present for the inspection.

The Division discussed Pikeview's submission of as-built documents and an updated slope stability analysis as required by Amendment 4 (AM-4). This information was presented to the Division at the start of the inspection. Comparisons between the original modeling of designed slope stability in 2019 and models run in 2024 which were updated for onsite conditions show negligible amounts of change in overall Factor of Safety. Both the 2019 and 2024 slope stability models meet the Factor of Safety requirements in accordance with Table 1 - Recommended Factors of Safety for Slope Stability Analysis for Operations and Reclamation within Section 30.4 of the Policies of the Mined Land Reclamation Board (MLRB) effective May 16, 2018 (attached). A summary of this information will be provided in Pikeview's TR submission which provides the Division with all the above slope stability analyses and as built designs.

Records: Compaction testing records were reviewed back to July 25th, the last date not available during the previous inspection. Earthwork is complete at the Pikeview. Meaning, all compaction testing is complete on the buttress fill. All test results reviewed in this period (July 25th – July 31st) demonstrated at least 90 percent compaction in compliance with the approved specification. Highest compaction numbers were at 100%. No retests were required. In total, compaction testing occurred from March of 2022 to July of 2024.

Mr. Schnabel presented the Leica prism system data and trends for August. Settlement on all prisms continues to decrease and most prisms are seeing no significant movement. A majority of movement that is accounted for within the prism data is on a scale of hundredths of a foot. Prisms have been in place onsite and further west on Forest Service property for over ten years. Prism data shows that areas west of the Pikeview boundary have not moved. Prism data collected within the Pikeview boundary supports the conclusion that slope stability is being achieved on the buttress as well. The submission of additional geotechnical modeling as described above ensures the longevity of slope stability at the site.

Three new prisms have been added to the south, middle, and north peak areas on Forest Service property. One to two more prisms are planned to be installed in the tension crack area on the 7700 prism level. The Leica prism system will stay in place until the Division approves the full and final release of the Pikeview Quarry permit. After this release of jurisdiction, it will be up to the landowners whether or not to keep the system in place.

The mine sign, which included all required information pursuant to Rule 3.1.12, was located at the site's access road.

Backfilling and Grading:
All major earthwork is complete at the site. All placed backfill was tested for compaction in accordance with the approved specifications until the conclusion of earthwork activities on July 31, 2024. All equipment associated with the earthwork contractor has been removed from the site. The only remaining equipment on site will be used in revegetation efforts and in the placing of rip rap in drainage channels.

Roads: As stated in previous inspection reports, the Forest Service has requested that no formal roads are to remain on their portion of the property in final reclamation. The Forest Service inspected Pikeview's current work on road obliteration in the southern drainage channel area and approved the obliterated state of the western half of the channel area (Photo 5). The Forest Service had concerns about a portion of the channel designed to be slightly

flattened (Photo 6) and the potential for erosion gullies and scouring of channel sides. Further discussion of this item can be found under the 'Sediment Control' section. The Forest Service also stated that if the widened, flat area of the channel is to remain, road obliteration further down the slope should ensure that the area is completely inaccessible via motorized vehicles. Further barriers will include large boulders and tree debris.

Fish and Wildlife: No negative impact on wildlife was observed. Mr. Schnabel indicated that Bighorn sheep were observed onsite throughout the last month. Bighorns have been ripping up planted shrubs along some of the buttress benches.

Revegetation & Topsoil: Remaining activities include continuing to topsoil and mat slopes, placing rip rap in drainage channels and planting a few remaining trees and shrubs. Revegetation efforts are being monitored by staff on site. The U.S. Forest Service has also conducted a number of site visits to advise site personnel on best practices invasive species removal before final seeding activities. Weeds currently being treated at the site include a List A noxious weed species, Myrtle spurge along with common knapweed, thistle, toadflax, and mullein.

Only the top benches remain to be matted and seeded at the time of this inspection. Matted areas continue to show signs of stability in supporting grasses and shrubs, though Bighorn sheep in the area have frequented the site and eaten or ripped up some of the shrubs. Trees planted across the site are experiencing some dieback as well. Recent vegetation growth was observed across the main buttress portion of the site (Photos 11 and 12). Growth in this area appeared to be supporting multiple species of grasses and transplanted shrubs. The northern borrow area, which is both City and U.S. Forest Service property will need additional seeding to address the erosion rills and monoculture growth observed on these slopes (Photos 1 and 2). Mr. Schnabel indicated that extra coconut fiber matting would be used in these areas to promote growth and protect against erosion issues. The area to be re-matted also includes the first bench of the buttress.

Hydroseeding of the upper peaks is partially complete and matting continues on benches just below this area (Photo 3). Irrigation tanks have been installed along the Level 1 bench, but tanks have yet to be placed on additional slopes. The Division and Mr. Schnabel discussed the advantages and disadvantages of irrigating the matted slopes. Irrigation will help to establish initial vegetative cover, but long-term exposure to irrigation may weaken / shorten the root system of vegetation, making it less resistant to the drier, more infrequent precipitation events usual of this geographic area. Instead, the site may use water trucks to simulate more realistic, infrequent but heavier precipitation events. This would allow root structures to grow stronger in the initial growth stages and adapt to the naturally sporadic precipitation events that will follow once irrigation stops. This will set vegetation up for success in final reclamation and create vegetated conditions that are in compliance with Rule 3.1.10(1).

The Forest Service, Division, and site personnel also discussed plans for grading and revegetation of the north facing slope in the South Borrow area (Photo 13). This area is currently rocky and unvegetated but could potentially be partially vegetated using similar methods as used on the three peaks area. Discussion of this item has been included as a post-inspection follow up item.

Sediment Control
Maintenance on coconut matting impacted by storm events continues. A small amount of erosion and sedimentation can be seen on the middle benches (Photo 4). As benches above these areas are seeded and matted, erosion will decrease. Grass was observed to be growing through these small patches of deposited material.

The City and Forest Service voiced their concern regarding construction of the southernmost drainage channel. While the channel is currently built to the DRMS approved design, on-site conditions suggest the potential for erosion gullies, scouring of channel sides, or stormwater overtopping the sides of the channel. The channel is steep in some areas, especially along the widened area (Photos 8 and 10) and the turn of the channel is relatively sharp cut (Photo 9). Meaning, stormwater could potentially run outside of the channel or erode the channel and impact function. While the armoring of the entire channel may not be necessary, the Division suggests that some type of

energy dissipating structure would be beneficial in this portion of the channel where steep grades will encourage fast flowing water. However, should the channel prove to function effectively as an unlined limestone and granite bedrock channel as per the approved design, then no additional armoring will be required by the Division.

Hydrologic Balance: Final configurations of the surface water drainage channels continue to be constructed onsite as per the approved design. As final reclamation progresses, rip rap will be used to stabilize these channels. The placement of rip rap has occurred in some channels around the site but has been impacted by storm events and will need to be replaced. All rip rap needed for construction is already stored on site and has been largely sourced from onsite areas like the Dragon's Back area and three peaks areas.

Water is still consistently flowing through the culvert just west of the main office area. This suggests that french drains installed under the buttress are functioning properly. The diversion of water away from the buttress and previous land slide area is integral to the long-term success of Pikeview's slope stability. As drainage channels are constructed to design, the site will be closely monitoring how channels are tolerating stormwater flows in relation to erosion, scouring and overall stability. The site will make necessary adjustments to channel design on an as needed basis as problems arise and reclamation progresses. As maintenance occurs, special care will need to be taken to not disrupt final reclamation vegetation already in place around the site.

Post Inspection Meeting: No problems or possible violations were observed during the inspection. Items of importance discussed during the site meeting and items which will need to be followed up on are summarized below:

- Action will need to be taken to address the small impoundment of water near the western peaks
- Future reduction of monthly inspection and report requirements to begin only when monitoring of revegetation efforts remain
- Address concerns with the southernmost drainage channel in the South Borrow area
- Specify revegetation and grading efforts to be utilized for the north facing slope of the South Borrow area near Forest Service property
- Continue to monitor and address invasive species removal across the site

Photographs taken during the inspection have been included below. Responses to this inspection report should be directed to: Hunter Ridley at the Division of Reclamation, Mining and Safety, 1313 Sherman St., Room 215, Denver, CO 80203. Direct contact can be made by phone at 720-868-7757 or via email at hunter.ridley@state.co.us.

PHOTOGRAPHS

Photo 1: Representative view of northern, unmatted slopes of city property.

Photo 2: View northwest of U.S. Forest Service land in the northern portion of the site; this area is to be matted for revegetation.

Photo 3: View northwest from City property, matting is being applied to upper slopes.

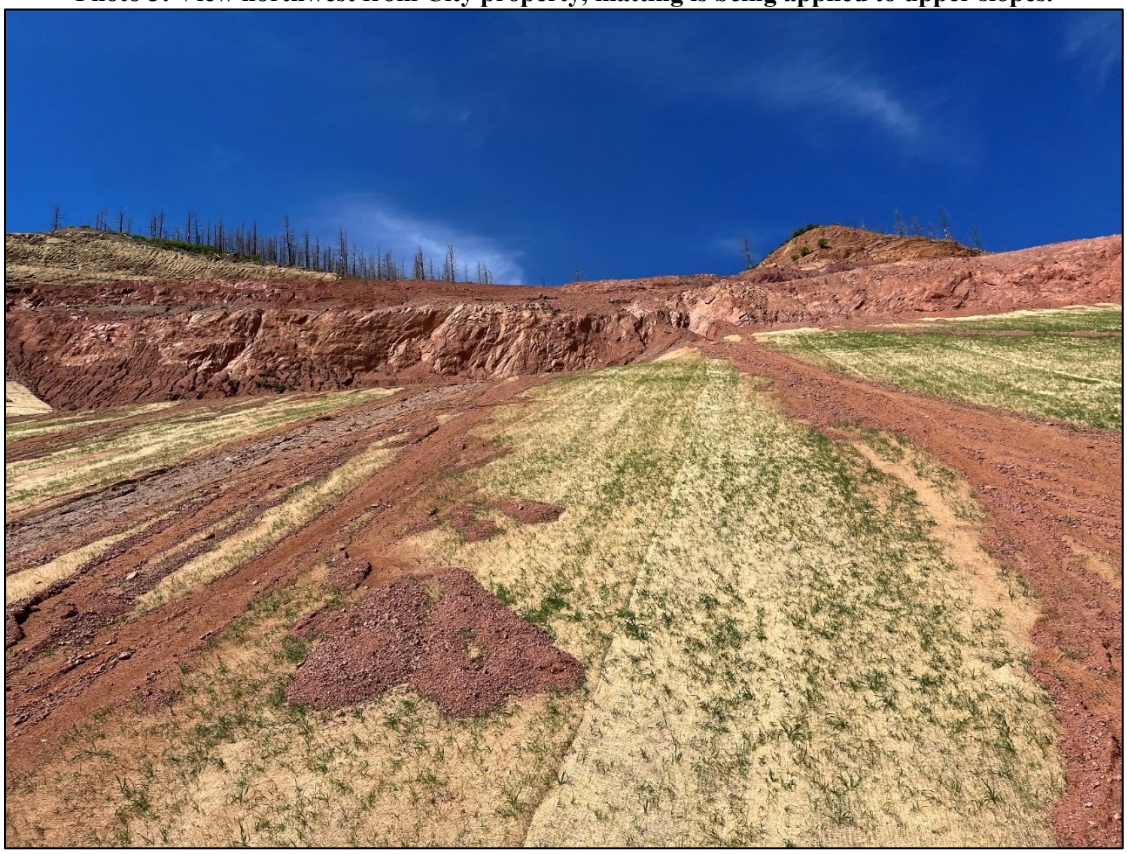

Photo 4: View west near the BFR area, grass continues to grow through sedimented material.

Photo 5: View east of the southernmost drainage channel, site of road obliteration on U.S. Forest Service land.

Photo 6: View southeast of a widened area of the southernmost drainage channel.

Photo 7: View east of the end of the southern drainage channel, water will be routed over the edge of this feature into a plunge pool.

Photo 8: View looking up from the flattened area of the southern drainage channel.

Photo 9: View south from the flat portion of the drainage channel.

Photo 10: View northwest from the turn at the southern corner of the drainage channel.

Photo 11: View north of the matted and buttressed slope.

Photo 12: View of the lower benches of the buttressed slope.

Photo 13: View south of the rocky southern slope, revegetation of this area is currently being discussed.

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be inspected at least once every two years, or more frequently if deemed necessary.

20.7.5 – Notices of Intent

The Board directs the Division to inspect all operations for which a NOI has been submitted to and approved by the Division in accordance with section 34-32-113 and 34-32.5-113, C.R.S. as set forth below.

20.7.5.1 – Pre-operational Inspections. The Division shall evaluate whether to conduct a pre-operational inspection of any new NOI operation or any modification to an existing NOI operation on a case by case basis. The Division shall conduct a pre-operational inspection of any new NOI or any modifications to an existing NOI operation at which historic or pre-law features are to be disturbed or re-established. When sites are on land managed by a federal agency, a joint inspection with the federal agency is advised. The Division may determine not to conduct an inspection of any NOI operation which the Division determines to have minimal disturbance area or no potential to impact either the environment or the prevailing hydrological balance, provided that the NOI includes photographic documentation of pre-activity conditions.

20.7.5.2 – Potential for Environmental Impact. The Division shall inspect any active NOI operation that the Division determines to have no potential to affect the prevailing hydrological balance or have any other environmental impacts at least once every four years. The Division shall inspect any active NOI operation that may affect the prevailing hydrological balance or have any other environmental impacts as the Division deems necessary, but no less than once every four years.

20.7.5.3 – NOI Operations in Reclamation. The Division shall inspect all active NOI operations that are in any phase of reclamation: (a) once during the first year following the Division's receipt of notice of reclamation to ensure reclamation is progressing; and (b) once during the fourth year of reclamation to evaluate whether additional tasks must be accomplished to achieve final reclamation release. The Division may adjust the frequency of inspections as the Division deems necessary to ensure adequate monitoring of operations that are either sensitive areas or that may require particular environmental protection measures.

20.7.5.4 – Abandoned NOI Operations. Any active NOI operation for which an annual report is not submitted for two consecutive years shall be considered abandoned. The Division shall inspect an NOI operation that is considered abandoned for the purpose of ensuring that the financial warranty is sufficient to complete reclamation.

30.0 – Factors of Safety for Slope Stability/Geotechnical Analyses

30.1 – Definitions.

Factor of Safety – Ratio of forces resisting movement to those driving movement.

Slope Failure – the movement (sliding or collapsing) of rock and/or soil in response to gravitational stresses, often under the influence of a rainfall or seismic activity.

Slope Stability – the resistance of inclined surface to failure by sliding or collapsing.

Slope Stability Analysis – performed to assess the safe design of a human-made or natural slopes (e.g. open-pit mining, excavations, embankments, road cuts, etc.) and the equilibrium conditions.

30.2 – Declaration of Purpose

The Division of Reclamation, Mining and Safety Minerals Program (Division) issues this memorandum to promote the orderly development of the state's natural resources while considering the industry's "standard of care" relative to Factors of Safety with the intent to:

i. Protect and promote the safety and general welfare of the people of Colorado,
ii. Ensure reclamation of lands affected by mining to beneficial use, and
iii. Aid in the protection of aquatic resources and wildlife.

30.3 – Background

In the past, the Division has typically accepted a factor of safety (FS) greater than 1.0 for slope stability analyses to demonstrate "that such structures shall not be damaged by activities occurring at the mining operation" pursuant to Rules pertaining to permanent man-made structures and geotechnical stability: Construction Materials Rules 6.3.12(b) and 6.4.19(b) and 6.5 and Hard Rock Rules 6.3.12(b), 6.4.20(b) and 6.5. This practice was based on the oversimplified concept that a slope with a FS > 1.0 is stable. This is technically true **IF** there is a *comprehensive and complete* understanding of all the geologic, hydraulic, land use, and other conditions that influence the forces and stresses determining whether or not the slope in question can or will fail. However, this is very rarely possible or feasible, particularly in a mining application. An FS must account for uncertainties (geologic setting, groundwater conditions, mining parameters, etc.), and the selection of an appropriate FS for slope stability should consider the following factors:

1. Magnitude of damages (potential risk to human safety, environmental impact and property damage),
2. Reliability of geologic information such as the proximity to faults, orientation of jointing, and subsurface soil and water data,

3. Changes in soil properties due to mine operations and variability in subsurface material,
4. Accuracy (or approximations used) in developing design/ analysis methods,
5. Additional considerations if relevant: Construction tolerances, Relative change in probability of failure by changing the factor of safety, and Relative cost of increasing or decreasing the factor of safety.

The Division engineering staff has researched the standard of care for factors of safety accepted by the industry, including literature searches, regulatory agency requirements/guidelines, and departments of transportation standards. In order to be consistent with other Colorado State agencies, we also considered FS standards used by the Colorado Department of Transportation (CDOT) and the Colorado Geological Survey (CGS). CDOT uses the AASHTO minimum FS of 1.3 for construction slopes near roadways and utilities. CGS uses a minimum FS of 1.5 for residential areas when using "generalized" strength values, or 1.3 for analyses when good quality site-specific soil parameters are known. It should be noted that most industry standards assume a permanent slope configuration, ignoring the temporary conditions that are frequently observed in the mining industry.

30.4 – Guidance for Stability Criteria and Use of Minimum Factors of Safety

The permittee should either follow the criteria in Table 1 for all stability analyses submitted to the Division; or, alternatively, the permittee may submit stability analyses based on site-specific engineering analysis performed in consideration of good practices as specified in relevant industry guidelines and/or professional standards and reviewed by the Division on a case-by-case basis.

Slope stability analyses for existing facilities may also be reviewed on a case-by-case basis, subject to the criteria described herein.

Table 1. Recommended Minimum Factors of Safety for Slope Stability Analyses for Operations and Reclamation

Type of Structure/Consequence of Failure	Generalized, Assumed, or Single Test Strength Measurements	Strength Measurements Resulting from Multiple Tests(1)
Non-Critical Structures (e.g., fences) No imminent danger to human life, minor repair costs, and minor environmental impact if slope fails	1.3 (1.15)(2)	1.25 (1.1) (2)

Table 1. Recommended Minimum Factors of Safety for Slope Stability Analyses for Operations and Reclamation

Critical Structures (e.g., residences, utilities, dams, pipelines, irrigation canals, public roads, etc.) Potential human safety risk, major environmental impact, and major repair costs if slope fails (includes Environmental Protection Facilities/EPFs, such as tailings facilities, heap leach pads, process effluent ponds, milling facilities, overburden/waste rock storage facilities, and hazardous/toxic material storage facilities, etc.)	1.5 (1.3) (2)	1.3 (1.15) (2)

(1) The number of tests required to provide a high degree of confidence in the strength parameters used depends on the variability of the material being tested and the extent of disturbance.

(2) Numbers without parentheses apply for analyses using static conditions. Those within parentheses apply to analyses using seismic parameters. Based on site specific conditions, seismic analyses may be required and parameters selected shall be consistent with the risk and duration of the condition being considered.

* The values presented in Table 1 are not intended to supersede standards required by other agencies.

40.0 – Reserved.

50.0 – Reserved.

60.0 – Reserved.

70.0 – Board Administrative Procedures.

70.1 – Rotation of Board Chair

The position of Chair of the Board shall rotate among all members with the exception of the Department Executive Director or the Executive Director's designee and the member appointed by the State Conservation Board. Each Board member shall serve as Chair of the Board for a term of six months, beginning in April and October annually.

70.2 – Authority of Board Chair