SMARA SECTIONS ANALYSES

Carroll Canyon Mine
CA Mine ID # 91-37-0029

SMARA Section 2772 (c) Requirements

(1) Name and address of the surface mining operator and the names and addresses of any persons designated by the operator as an agent for the service of process.

SURFACE MINING OPERATOR CalMat Co., dba Vulcan Materials Company
500 North Brand Boulevard, Suite 500
Glendale, CA 91203

(2) Anticipated quantity and type of minerals for which the surface mining operation is to be conducted.

Maximum production levels are primarily determined by market demand. Approximately 25 million tons of material remains to be mined on the site as of 2020. Annual estimates of production vary from year-to-year depending on market demand.

(3) Proposed dates for the initiation and termination of surface mining operation.

INITIATION DATE Currently Operating
TERMINATION DATE December 31, 2050

(4) Maximum anticipated depth of the surface mining operation.

APPROXIMATE DEPTH 220 Feet
APPROXIMATE FINAL ELEVATION OF MINED SITE 210 Feet Above Mean Sea Level

(5) Reclamation Plan Maps

See Reclamation Plan.

(A) Size and legal description of the lands that will be affected by the surface mining operation.

SIZE 287.913 acres
LEGAL DESCRIPTION See Attachment A.
NAMES AND ADDRESSES OF OWNERS See Item #1, above.

(B) Property Lines, Setbacks, and Reclamation Plan Boundary

See Reclamation Plan.

(C) Existing and Final Topography

See Reclamation Plan.

(D) Detailed Geologic Description

General Geology of Area. The dominant geologic unit for the site is the Stadium Conglomerate, a mix of sand, gravel, and cobble-size particles. The base of the canyon exposes Stadium Conglomerate west of Camino Ruiz where mining operations are ongoing, and on the east side of Camino Ruiz in a few areas where mining has not been performed, principally at the southeast portion of the site where the plant and utility vault areas are located. The site east of Camino Ruiz hosts scattered undocumented fill areas and several backfilled excavations and former settling ponds. The project site is not subject to geologic hazards not common to other developed areas in San Diego County.

Detailed Description of the Geology of the Mine Site. At the completion of mining, the property will be underlain by undocumented fill, compacted fill, Very Old Paralic Deposits, and the Stadium Conglomerate Formation. Alluvium is present in the creek drainage along the south side of the western pit area.

Undocumented fills (Qudf) are present throughout most of the property. The undocumented fills are comprised of stockpiles of overburden soil from mining activities, reject spoils, rubble fills, accumulated soils in ponds, aggregate stockpiles, backfilled excavations from former settling ponds and miscellaneous stockpiles in various locations. Undocumented fills on the property east of Camino Ruiz were previously identified as evaluated. Some of the backfilled excavations contain several tens to as much as 180 feet of undocumented fill and pond deposits. The table below provides a brief summary of each identified undocumented fill area:

Summary of Identified Undocumented Fill Areas

Location	Comments
Utility Vault Area	This area was graded nearly flat to provide working/storage area for a manufacturer of utility vaults. The thickness of undocumented fills, if any, is not known in this area.
Plant Area	It appears no mining has been performed in this area, though some grading may have taken place to create level ground for mining operations. A previous boring encountered 13 feet of undocumented fill.
Pond No. 2	This area was reportedly excavated between 1967 and 1983. At the time of that exploration, the water was up to 15 feet deep. It has been estimated that up to 120 feet of predominantly silty clay deposits existed below the water at that time. The southeast corner of Pond No. 2 was previously used as a concrete wash out area. The thickness of concrete materials exceeds 36 feet.
Former Pond No. 1	It was reported that Former Pond No. 1 was excavated to a depth of about 180 feet and subsequently backfilled with FS-15 sand and rubble. FS-15 sand is a mining byproduct with a Sand Equivalent value of about 15.
Area North of Former Pond No. 1	No mining was reported to have occurred int his area, though fill was encountered and is estimated to be up to 30 feet thick.
Former Pond No. 3	This area contains up to 60 feet of fill, debris, and discarded equipment.
Rubble Fill	Up to 150 feet of rubble fill has been mapped in this area.
FS-15 Fill	About 67 feet of fill was encountered in this area during the exploration in 2002. The elevation in this area has been raised since that time.
Landfill Area	The estimated depth and character of fill in this area is unknown, but may be similar to the adjacent FS-15 Fill area.
West Pit	Active Mining is occurring. The area is underlain by stockpiles generated

	during mining, existing ponds, former ponds, and an embankment fill to support the conveyor belt and mining activities. Two areas at the western end of the pit have documented compacted fill placed over the mining pit bottom. Currently, undocumented fill has been stockpiled over the compacted fill.

Compacted fill (Qcf) was placed in two areas at the base of the western pit. The fill was placed in 2012 and 2018. Geocon Incorporated observed placement of the fill and performed compaction testing during grading. Fills were placed and compacted to at least 93 percent relative compaction. Alluvium (Qal) exists within the creek drainage along the property margin south of the west pit. Alluvium could also be present below undocumented fills in portions of the property east of Camino Ruiz. Kennedy and Tan (2008) mapped alluvium within the central and eastern portions of the property east of Camino Ruiz. Very Old Paralic Deposits (Qvop), formerly known as Lindavista Formation, is exposed on the upper portion of the mined slopes and canyon walls and caps the mesa top. This unit is also comprised of sand/gravel/cobble that can be well-cemented. It can also contain a very clayey surficial topsoil layer. The Eocene-age Stadium Conglomerate (Tst) is the predominant formational unit on the property. This unit was the primary material mined to generate aggregate. The deposit contains a relatively high percentage of cobble (up to approximately 60 percent by weight) embedded in a silty to clayey, fine to medium sand soil matrix. The cobble typically ranges in size from approximately three inches to 12 inches, however, boulder size clasts up to 24 inches can be present. Stadium Conglomerate is exposed on the perimeter mined slopes. Stadium Conglomerate is also present at the base of the western pit below the ponded water, stockpiles, and compacted fills. Stadium Conglomerate is also expected to be present on the east side of Camino Ruiz in areas where mining has not been performed; however, due to plant activities and stockpile soils, accurate mapping of the Stadium Conglomerate could not be performed.

(E) Location of railroads, utility facilities, access roads

See Reclamation Plan.

There are no railroads on or immediately adjacent to the site.

Utilities within the project site include San Diego Gas and Electric (SDG&E) power lines and sewer and water facilities. SDG&E powerlines and easements occur in the southern portion of the site and along the southern property line. The Carroll Canyon Trunk Serer #49 runs adjacent to the southern property line. Existing water pipelines in the vicinity include a 16-inch pipeline located in Camino Ruiz, which bisects the approximate center of the site; a 16-inch pipeline located in Black Mountain Road at the Carroll Canyon Road intersection just east of the project site; and a 12-inch pipeline located in Black Mountain Road at the Maya Linda intersection also to the east of the project site.

Existing and improved roads that provide access to the site and/or located in the site area include Camino Ruiz, Carroll Canyon Road, Black Mountain Road, and Maya Linda Road. Camino Ruiz is a north-south roadway that bisects the site. Carroll Canyon Road is an east-west roadway, occurring off-site to the east and terminating at the project site's eastern boundary. Carroll Canyon Road also joins the site at Camino Ruiz and travels off-site to the west through an adjacent property. Black Mountain Road is a north-south roadway that forms a portion of the site's eastern boundary. Maya Linda Road intersects with Black Mountain Road, terminating at the eastern site boundary. No new access roads would be constructed to serve the existing on-going mining operation. All temporary on-site access roads will be reclaimed. Existing roads that surround the project site and which will not be affected by mining will remain in place and provide access to the approved end use.

(F) Preparation by a California-licensed professional

All maps, diagrams, and calculations have been prepared by a California-licensed professional and include license number, name, signature, and seal of the licensee.

(6) Description of, and a plan for, the type of surface mining to be employed, and a time schedule that will provide for the completion of surface mining on each segment of the mined lands so that reclamation can be initiated at the earliest possible time on those portions of the mined lands that will not be subject to further disturbance by the surface mining operation.

TYPE OF MINING Open Pit; single-phased continuous mining operation until depletion.

The project site is composed of two large sections, divided by Camino Ruiz. The eastern area is currently used for on-going aggregate processing, stockpiling, loading, and the manufacture of ready-mix concrete and hot mix asphalt. Additionally, this area provides the primary ingress and egress for trucks and administrative staff and contains an office complex consisting of a modular building located at the eastern end of the property with access off Black Mountain Road. The western portion is actively mined and the aggregate is extracted, loaded, and conveyed via a tunnel to a primary crusher located on the facilities in the eastern portion. Reclamation has occurred in areas that have been mined. Reclamation is on-going and will continue as mining is completed.

(7) Description of the proposed use or potential uses of the mined lands after reclamation and evidence that all owners of a possessory interest in the land have been notified of the proposed use or potential uses.

The Mira Mesa Community Plan identifies the site as having the potential to be developed as either a future mixed-use project or a standard industrial/business park. Although the Community Plan includes the project site within the Carroll Canyon Master Plan Element, it requires preparation of a Master Plan to guide future development once mining and reclamation are concluded. There is no requirement that any development occur in the future. Similarly, the mining and Reclamation Plan does not commit nor does it establish criteria for future development.

(8) Description of the manner in which reclamation will be accomplished.

(A) Description of the manner in which contaminants will be controlled and mining waste will be disposed.

Upon completion of mining activities, disturbance areas will be reclaimed to match the design contours identified in the amended CUP application package, which are generally no steeper than 2:1 (horizontal:vertical). The project will result in a creation of large, relatively level pit floors with gradual side slopes on the north, east, and western borders. The ultimate site condition will include drainage improvements, sediment basins, and a new creek alignment.

Reclamation will occur in two distinct areas: West of Camino Ruiz (West Side) and east of Camino Ruiz (East Side). Slopework on the West Side involves the reduction of slopes and backfilling of the pit. This activity will include rough grading of slopes that are steeper than 2:1 (h:v) and spreading stockpiled materials. Cut and stockpiled material will be moved to low areas to reduce the amount of imported backfill that will be necessary. Imported fill material will be transferred to the West Side of the site using the conveyor system that is currently

in place. Due to the current site topography, it is not feasible to truck material to the West Side. Additional backfill material from off-site will be required to raise the pit floor elevation on the West Side to the contours required by the Reclamation Plan. All fill used will be clean, inert materials hauled in from off-site. Slopework on the East Side involves the reduction of slopes and stockpiled materials and exporting excess material to the West Side. This activity will include rough grading of slopes that are steeper than 2:1 (h:v) and relocating stockpiled materials. Cut and stockpiled material will be conveyed to the west pit as discussed above. In addition to backfilling and dozing the steep slope areas, the entire site will require reclamation. Slopes will be undulating and variable, with no slopes steeper than a 2:1 ratio.

As presented in Section 5.1.4 in the *Recommended Grading Specifications, Carroll Canyon Mine, Vulcan Materials Company, San Diego, California* (June 3, 2020, the site should be brought to final elevations with structural fill compacted in layers. Layers of fill should be no thicker than will allow for adequate bonding and compaction. All fill, including backfill and scarified ground surfaces, should be compacted to at least 90 percent of maximum dry density, at or above, optimum moisture content, as determined in accordance with ASTM Test Procedure D 1557-02. Fill materials near and/or below optimum moisture content may require additional moisture conditioning prior to placing additional fill. Fills less than 50 feet thick should be compacted to at least 90 percent of the maximum dry density at optimum moisture content or slightly above. Fills greater than 50 feet thick should be compacted to at least 93 percent of the laboratory maximum dry density at approximately two percent above optimum moisture content.

The slopes of the creek channel (both the main creek and tributary creek coming from Carroll Canyon Road) will require compaction as part of the reclamation. In addition to the creek channel and sediment basins, storm water drainage pipes, curb inlets (along Camino Ruiz), storm water energy dissipaters, and winged head walls will be installed throughout the site. A majority of the site perimeter is already fenced. A chain link fence to match the existing fencing will be installed in areas along the southern and eastern border of the West Side. Vegetation and overburden has been removed in advance of surface mining activities in accordance with the approved CUP. Any overburden and minerals that are stockpiled on the site are managed for water and erosion control consistent with State and local requirements. Erosion control facilities include settling ponds and basins. These facilities are maintained to control erosion and storm water runoff.

Settling basins have been planned throughout the property to prevent siltation of Carroll Canyon Creek and manage erosion within the property. Mining operations are conducted in a manner that substantially prevent siltation in the adjacent Carroll Canyon Creek. The proposed revegetation plan will provide short and long-term erosion control throughout the property through the utilization of appropriate native species.

All reasonable measures have been implemented to protect wetland resources and/or mitigate for impacts to wetlands. The proposed revegetation plan utilizes a full range of native species appropriate for the creation of upland and wetland vegetation communities suitable for wildlife habitat. Protection of existing habitat values is focused on protecting downstream habitats through the use of onsite water quality and erosion control best management practices.

Grading and revegetation associated with the Reclamation Plan has been designed to minimize erosion and to convey surface runoff to natural drainage courses. Depressions where water can collect during periods of heavy rainfall have been designed and occur in areas such that erosion of spillways will not occur. The basin within the western portion of the property has been designed with a pump system to minimize long periods of standing water and vector control issues.

Surface and groundwater will be protected from siltation and pollutants which may diminish water quality as required by the Federal Clean Water Act, sections 301 et seq. (33 U.S.C. section 1311), 404 et seq. (33 U.S.C. section 1344), the Porter-Cologne Act, section 13000 et seq., County anti-siltation ordinances, the Regional

Water Quality Control Board or the State Water Resources Control Board. The best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter-Cologne Act and the Federal Clean Water Act.

(B) Description of the manner in which affected streambed channels and streambanks will be rehabilitated to a condition that minimizes erosion and sedimentation.

Native vegetation will be established within the Carroll Canyon Creek, as shown on revegetation plans. Restored portions of Carroll Canyon Creek will be conserved as mitigation areas where wildlife habitat can occur. Performance standards for the restoration of Carroll Canyon Creek are contained in the Carroll Canyon Creek Enhancement Plan.

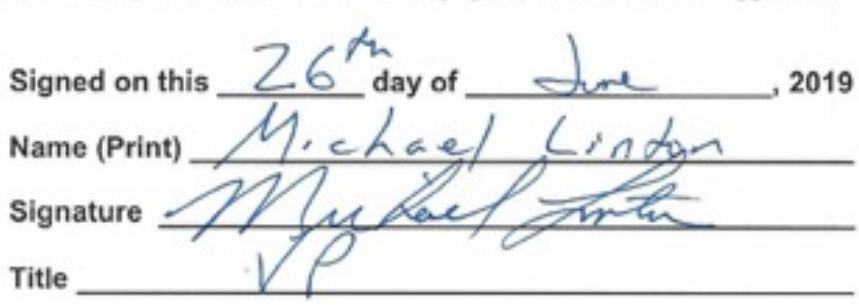
Wetland habitat occurring on-site is limited. Restoration of affected habitat will occur in accordance with local, state, and federal regulations. Best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1601 of the California Fish and Game Code.

(9) Assessment of the effect of implementation of the reclamation plan on future mining in the area.

The site represents the last mining site in Mira Mesa and will be mined to depletion. Areas surrounding the site are fully developed with urban uses. There will be no effect on future mining in the area.

(10) Statement of Responsibilities

I, the undersigned, herby agree to accept full responsibility for reclamation of all mined lands as described and submitted herein and in conformance with the applicable requirements of Articles 1 and 9 (commencing with Sections 3500 *et seq.* and 3700 *et seq.*, respectively) of Chapter 8 of Division 2 of Title 14 of the California Code of Regulation, the Surface Mining and Reclamation Act commencing with Section 2710 *et seq.*, and with any modifications requested by the administering agency as conditions of approval.



ATTACHMENT A
Legal Description

LEGAL DESCRIPTION

THE SOUTH 5 ACRES OF THE WEST 10 ACRES OF LOT 2 OF THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF SECTION 6, TOWNSHIP 15 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA ACCORDING TO THE OFFICIAL PLAT THEREOF. TOGETHER WITH THE SOUTH HALF OF THE NORTHEAST QUARTER OF SECTION 6, TOWNSHIP 15 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

EXCEPTING THEREFROM ALL OIL, GAS, ASPHALTUM AND OTHER HYDROCARBON SUBSTANCES, IN ON, OR UNDER OR WHICH MAY HEREAFTER BE PRODUCED FROM THE ABOVE DESCRIBED REAL PROPERTY, AS RESERVED IN THE DEED FROM THE SPRECKELS HOLDING COMPANY, RECORDED JULY 18, 1946 IN BOOK 2185, PAGE 246 OF OFFICIAL RECORDS. TOGETHER WITH THE RIGHT TO DRILL FOR, PRODUCE, EXTRACT AND TAKE OIL, GAS, ASPAHLTUM AND OTHER HYDROCARBON SUBSTANCES FROM AND TO STORE THEM UPON, THE SAID REAL PROPERTY, WITH THE RIGHT OF ENTRY THEREON AT ANY AND ALL TIMES.

ALSO EXPECTING THEREFROM THAT PORTION LYING EASTERLY OF THE WESTERLY LINE OF CARROLL CANYON CENTRE MAP NO. 10179 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY AUGUST 27, 1981.

PARCELS 1 AND 2 OF PARCEL MAP 15786 IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY SEPTEMBER 7, 1989.

PARCEL ‘A’ OF MIRA MESA VERDE UNIT NO. 14, IN THE CITY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 6912, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, APRIL 22, 1971.

THE EAST HALF OF THE SOUTH HALF OF LOT 3 IN SECTION 6, TOGETHER WITH THE WEST HALF OF THE SOUTH HALF OF LOT 3 IN SECTION 6 AND ALSO TOGETHER WITH THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER OF SECTION 6, TOWNSHIP 15 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO UNITED STATES GOVERNMENT SURVEY.

LOT 5 IN SECTION 6, TOWNSHIP 15 SOUTH, RANGE 2 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO UNITED STATES GOVERNMENT SURVEY.

Carroll Canyon Mine
CA Mine ID # 91-37-0029

SMARA Section 2773 and 2773.1

§ 2773.

(a) The reclamation plan shall be applicable to a specific piece of property or properties, shall be based upon the character of the surrounding area and such characteristics of the property as type of overburden, soil stability, topography, geology, climate, stream characteristics, and principal mineral commodities, and shall establish site-specific criteria for evaluating compliance with the approved reclamation plan, including topography, revegetation and sediment, and erosion control.

The Reclamation Plan applies to a specific piece of property and is based upon the character of the surrounding area and such characteristics of the property as type of overburden, soil stability, topography, geology, climate, stream characteristics, and principal mineral commodities. The Reclamation Plan establishes site-specific criteria for evaluating compliance with the approved reclamation plan, including topography, revegetation and sediment, and erosion control.

(b) By January 1, 1992, the board shall adopt regulations specifying minimum, verifiable statewide reclamation standards. Subjects for which standards shall be set include, but shall not be limited to, the following:

(1) Wildlife Habitat.
(2) Backfilling, regarding, slope stability, and recontouring.
(3) Revegetation.
(4) Drainage, diversion structures waterways, and erosion control.
(5) Prime and other agricultural land reclamation.
(6) Building, structure, and equipment removal.
(7) Stream protection.
(8) Topsoil salvage, maintenance, and redistribution.
(9) Tailing and mine waste management.

§ 2773(b)(1). Performance Standards for Wildlife Habitat.

Wildlife and vegetation occurring on the project site are addressed in the Biological Technical Report and Section 5.5, *Biological Resources*, of the Stone Creek EIR. Native vegetation will be established within the Carroll Canyon Creek, as shown on revegetation plans. Restored portions of Carroll Canyon Creek will be conserved as mitigation areas where wildlife habitat can occur. Performance standards for the restoration of Carroll Canyon Creek are contained in the Carroll Canyon Creek Enhancement Plan. Wetland habitat occurring on-site is limited. Restoration of affected habitat will occur in accordance with local, state, and federal regulations. Best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1601 of the California Fish and Game Code.

§ 2773(b)(2). Performance Standards for Backfilling, Regrading, Slope Stability, and Recontouring.

Where backfilling is proposed for urban uses (e.g., roads, building sites, or other improvements sensitive to settlement), fill material will be compacted in accordance with the Uniform Building Code, published by the International Conference of Building Officials and as adopted by the City of San Diego. Piles will be stockpiled in such a manner as to facilitate phased reclamation. Final reclaimed fill slopes will not exceed 2:1 (horizontal:vertical). As part of the Reclamation Plan, all manufactured slopes have been designed to conform to the surrounding topography and facilitate the end use of the property. Perimeter cut slopes have been designed to provide some undulation and variation in landform to help them blend with nearby natural slopes. All cut slopes will have a minimum slope stability factor of safety that is suitable for the proposed end use. Permanent placement of mining materials (including mining waste and overburden) will not occur within wetland habitat areas. (See *Slope Stability Analysis for Reclamation Slopes, Carroll Canyon Mine, San Diego California*, GEOCON, June 3, 2020, included as Attachment A.)

§ 2773(b)(3). Performance Standards for Revegetation.

The proposed revegetation plan has been developed with a series of native plant palettes adapted from local vegetative communities with species expected to have good initial survival characteristics and long-term self-regeneration. Reference site will be utilized to establish vegetative density, cover and species richness targets for the various habitats targeted within the revegetation plan. Planting shall utilize a combination of container stock and hydroseeding applications to accomplish the desired characteristics and meet the success criteria. Before planting, compacted flatter areas of the site shall be ripped to a depth of 12 inches. All access/haul roads targeted for revegetation shall be stripped of any remaining roadbase and ripped to a depth of 12 inches. Laboratory tests of final surface soils shall provide direction regarding the appropriate soil conditioners and quantities necessary to improve the soils nutrients and structure to support revegetation efforts. Planting shall occur between October 15th and April 15th to coincide with seasonal rainfall patterns. A temporary irrigation system is anticipated during initial plant establishment through the first three growing seasons. Weeding and other maintenance activities shall occur during the first five years after planting. Final success of the revegetation areas shall be based on specific performance criteria.

§ 2773(b)(4). Performance Standards for Drainage, Diversion Structures, Waterways, and Erosion Control.

No ground water resources within the vicinity of the property are utilized for domestic or agricultural purposes. Downstream beneficial uses of water relate primarily to wildlife habitat, with sediment being the primary pollutant of concern. The best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act and the Federal Clean Water Act.

§ 2773(b)(5). Performance Standards for Prime and Other Agricultural Land Reclamation.

Does not apply. The site is not designated as Prime Agricultural Lands. The site is not agricultural lands, and the approved end use is not agriculture.

§ 2773(b)(6). Performance Standards for Building, Structure, and Equipment Removal.

At the time of reclamation, all equipment, supplies and other materials will be removed from the site and all waste will be disposed of in accordance with state and local health and safety ordinances. All buildings, structures, and equipment shall be dismantled and removed prior to final mine closure.

§ 2773(b)(7). Performance Standards for Stream Protection.

The project does not involve in-stream surface mining or extraction of sand and gravel from diver channels. Surface and groundwater will be protected from siltation and pollutants which may diminish water quality as required by the Federal Clean Water Act, sections 301 et seq. (33 U.S.C. section 1311), 404 et seq. (33 U.S.C. section 1344), the Porter- Cologne Act, section 13000 et seq., County anti-siltation ordinances, the Regional Water Quality Control Board or the State Water Resources Control Board.

The best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1600 of the California Fish and Game Code.

§ 2773(b)(8). Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.

Does not apply. The Reclamation Plan does not involve topsoil salvage, maintenance, and redistribution.

§ 2773(b)(9). Performance Standards for Tailing and Mine Waste Management.

Mine waste disposal is required to be consistent with State Water Resources Control Board mine waste disposal regulations contained in Article 1, Subchapter 1, Chapter 7 of Title 27, California Code of Regulations.

§ 2773.1.

The applicant will submit financial assurances in accordance with § 2773.1. The financial assurances will ensure reclamation is performed in accordance with approved reclamation plan.

ATTACHMENT A
Slope Stability Analysis for Reclamation Slopes

Project No. 07524-32-02
June 3, 2020

Vulcan Materials Company
Properties Office
P.O. Box 130635
Carlsbad, California 92013

Attention: Mr. Mike Linton

Subject: SLOPE STABILITY ANALYSIS FOR RECLAMATION SLOPES
CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

Reference: *Reclamation Plan, Carroll Canyon Mine, CA Mine ID# 91-37-0029, City of San Diego, California*, prepared by BDS Engineering, Inc., plot date April 28, 2020.

Dear Mr. Linton:

In accordance with the request of BDS Engineering, we have performed slope stability analyses for planned slopes shown on the referenced reclamation plans. We understand the City of San Diego LDR-Geology reviewer has requested documentation regarding cut slopes proposed on the property having a "minimum slope stability factor of safety that is suitable for the proposed end use".

Information on the referenced reclamation plans indicate that perimeter slopes will have an inclination of 2:1 (horizontal to vertical) or flatter. Taller slopes will have a bench every 30-foot vertical height. The tallest reclamation slopes are planned in Phase 4 where cut slopes up to approximately 120 feet will be constructed.

We used the computer program Slope/W (2018) distributed by Geo-Slope International to perform the slope stability analysis. The program uses conventional slope stability equations and a two-dimensional limit-equilibrium method to calculate the factor of safety against deep-seated failure. For our analyses, Spencer's Method with a circular failure mechanism was used. Graphical output of our analysis are provided on Figures 1 and 2. For conservatism, we did not include slope benches in our analysis. Also, fill slopes up to 120 feet are not currently shown on the reclamation plan; however, we used the maximum reclamation slope height for both the fill and cut slope analyses. Based on our analyses, project slopes have calculated factors of safety of 1.5 or greater with respect to global stability.

We performed seismic slope stability analysis in accordance with *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, prepared by the Southern California Earthquake Center (SCEC), dated June 2002 and *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008)*.

The seismic slope stability analyses were performed using a peak ground acceleration of 0.27g for fill slopes and 0.23g for cut slopes. These accelerations correspond to a 10 percent probability of exceedance in 50 years. A modal magnitude and modal distance of 6.9 and 11.4 kilometers, respectively, were used in the analyses. The peak ground acceleration, modal magnitude, and modal distance were determined from a deaggregation analysis.

Using the parameters discussed above, equivalent site accelerations (k_{EQ}) of 0.154g and 0.133g were calculated for fill and cut slopes, respectively, to perform a screening analysis. The calculated k_{EQ} was imputed as the horizontal seismic coefficient in the stability analyses. The analyses indicate factors of safety of 1.0 or greater for both fill and cut slopes. A slope is considered acceptable by the screening analysis if the calculated factor of safety is greater than 1.0 using k_{EQ}; therefore, the slopes pass the screening analysis for seismic slope stability. Printouts of the seismic slope stability analysis are provided on Figures 3 through 6.

Surficial slope stability analysis are shown on Figures 7 and 8. Our analysis indicates the slopes have a factor of safety of at least 1.5 for surficial stability.

Based on our analyses, cut and fill reclamation slopes have a minimum slope stability factor of safety for both global (static and seismic) and surficial that is suitable for the proposed end use.

If you have any questions, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Rodney C. Mikesell
GE 2533

David B. Evans
CEG 1860

RCM:DBE:arm

(e-mail) Addressee
(e-mail) BDS Engineering
Attention: Mr. Tom Jones
(e-mail) KLR Planning
Attention: Ms. Karen Ruggels

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Fill Slope.gsz
Date: 05/28/2020

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf (Compacted Fill)	130	300	32

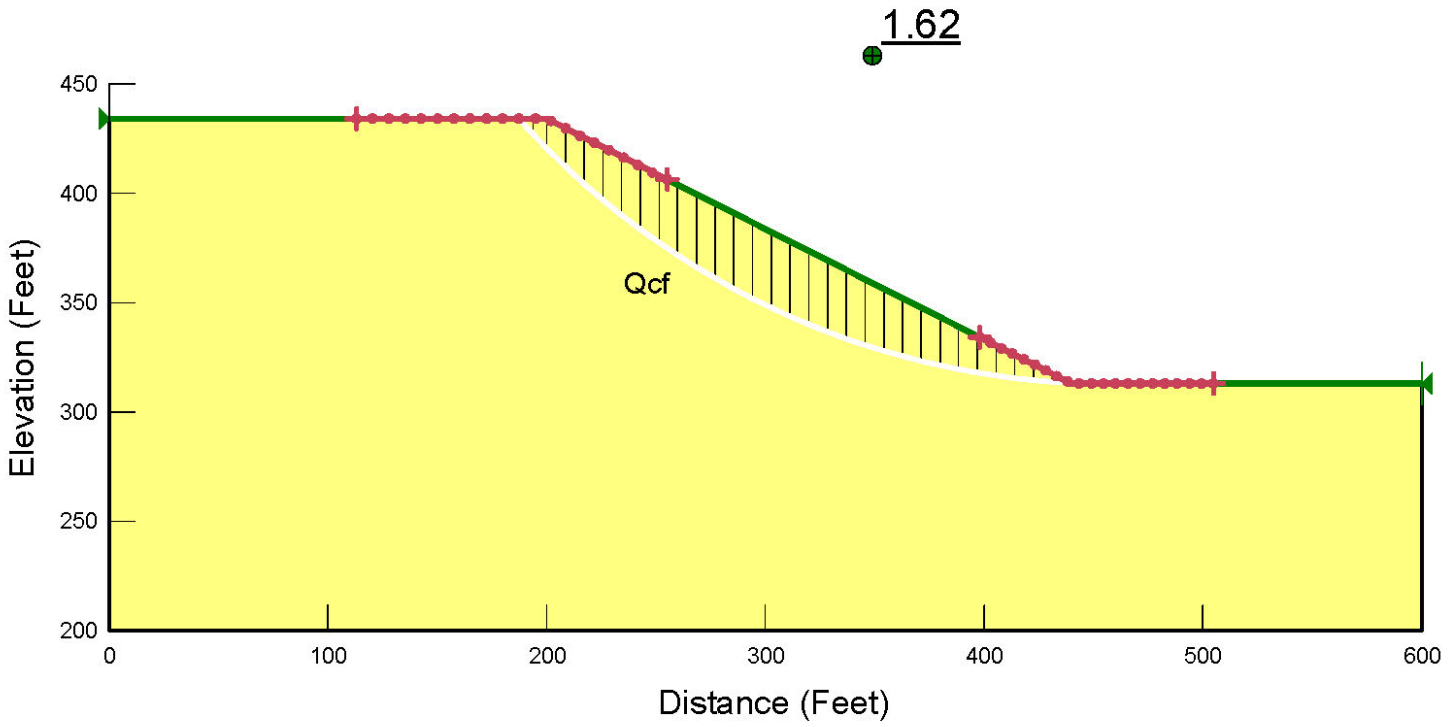


Figure 1

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Cut Slope.gsz
Date: 05/28/2020

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Tst (Stadium Conglomerate)	135	500	40

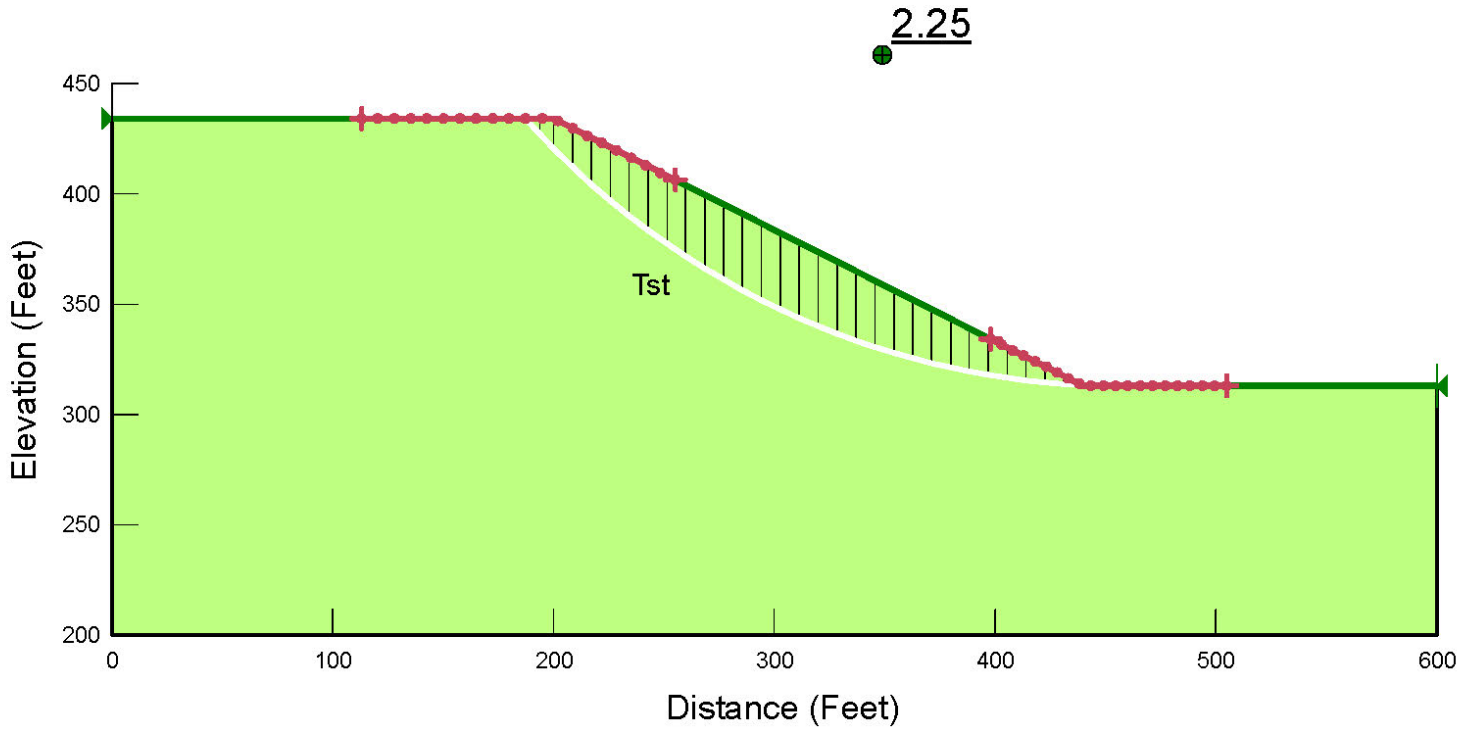


Figure 2

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Fill Slope (Seismic).gsz
Date: 05/28/2020
Horz Seismic Coef.: 0.154

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf (Compacted Fill)	130	300	32

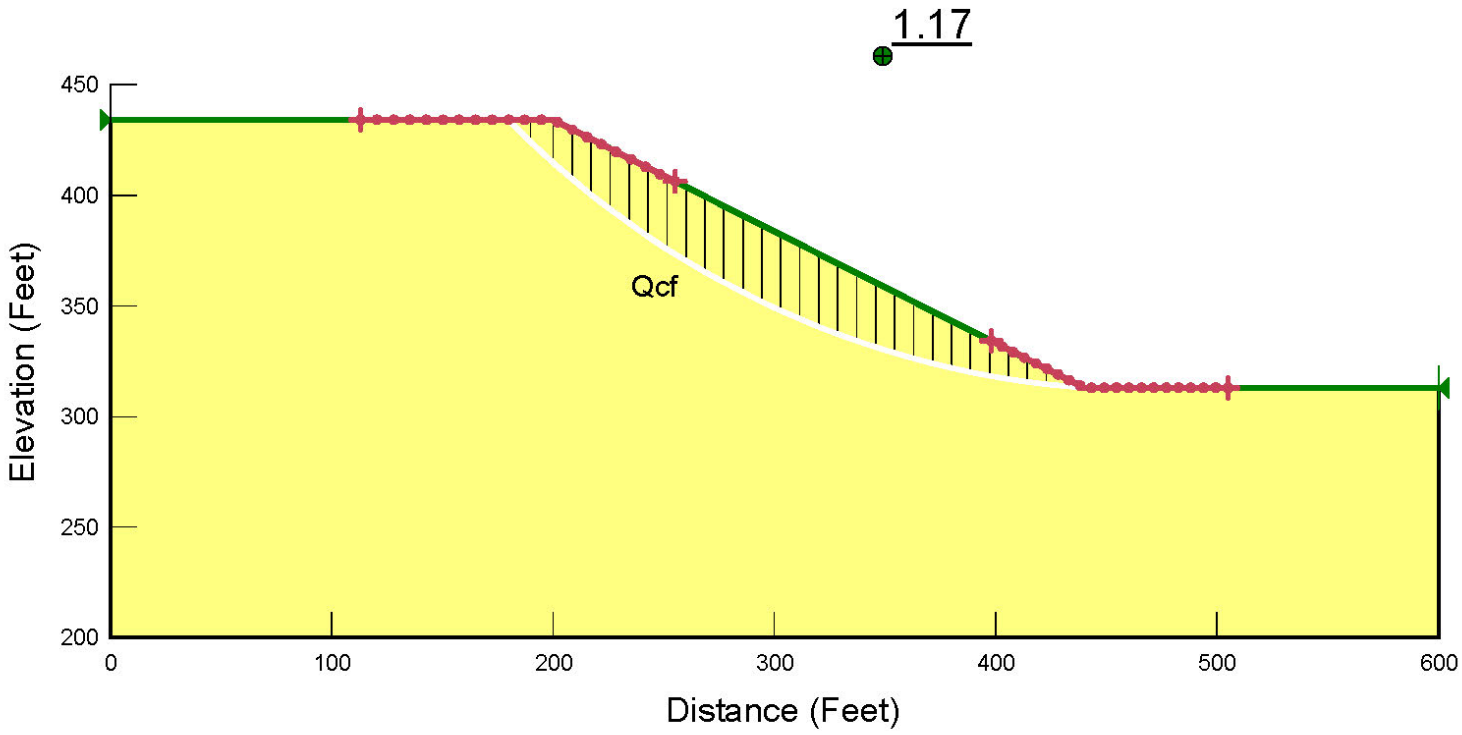


Figure 3

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Cut Slope (Seismic).gsz
Date: 05/28/2020
Horz Seismic Coef.: 0.133

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Tst (Stadium Conglomerate)	135	500	40

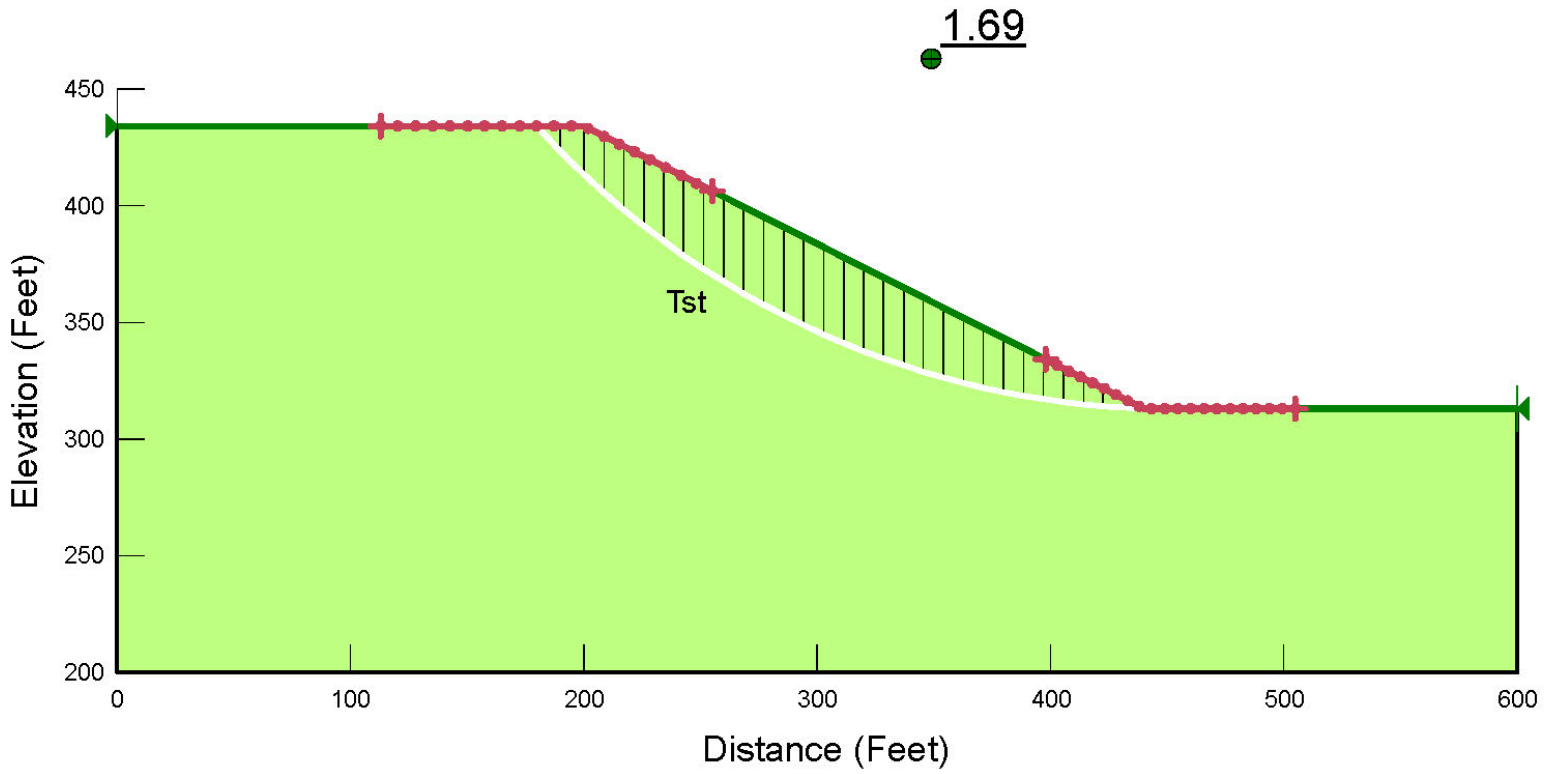


Figure 4

GEOCON

Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project	Carroll Canyon Mine	**Computed By**	RCM
Project Number	07524-32-02		
Date	05/28/20		
Filename	Stonecreek Fill Slopes		

Peak Ground Acceleration (Firm Rock), MHA_r, g	0.27	10% in 50 years
Modal Magnitude, M	6.90	
Modal Distance, r, km	11.4	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft^2 (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5\text{-}95}|_{med}$, sec	13.006	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m, sec	0.616	

Initial Screening with MHEA = MHA = k_{max}g

k_y/MHA	NA
f_{EQ}(u=5cm) = (NRF/3.477)*(1.87-log(u/((MHA$_r$/g)*NRF*$D_{5\text{-}95}$)))	0.5709
k_{EQ} = feq(MHA$_r$)/g	0.154
Factor of Safety in Slope Analysis Using k_{EQ}	1.17

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, T_s = 4H/V_s, sec	NA
T_s/T_m	NA
MHEA/(MHA*NRF)	NA
NRF = 0.6225+0.9196EXP(-2.25*MHA$_r$/g)	1.12
MHEA/g	NA
k_y/MHEA = k_y/k_{max}	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) NA

FIGURE 5

GEOCON

Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Carroll Canyon Mine **Computed By** RCM
Project Number 07524-32-02
Date 05/28/20
Filename Cut Slopes

Peak Ground Acceleration (Firm Rock), MHA_r, g	0.23	10% in 50 years
Modal Magnitude, M	6.90	
Modal Distance, r, km	11.40	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft^2 (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95}\|_{med}$, sec	13.006	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m, sec	0.616	

Initial Screening with MHEA = MHA = k_{max}g

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477)*(1.87-\log(u/((MHA_r/g)*NRF*D_{5-95})))$	0.5775
$k_{EQ} = feq(MHA_r)/g$	0.133
Factor of Safety in Slope Analysis Using k_{EQ}	1.69

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
MHEA/(MHA*NRF)	NA
$NRF = 0.6225+0.9196EXP\{-2.25*MHA_r/g\}$	1.17
MHEA/g	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) **NA**

FIGURE 6

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	=	Infinite
DEPTH OF SATURATION	Z	=	5 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)	
SLOPE ANGLE	i	=	26.6 degrees
UNIT WEIGHT OF WATER	γ_w	=	62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	=	130 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	=	32 degrees
APPARENT COHESION	C	=	300 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ cos^2\ i\ tan\ \phi}{\gamma_t\ Z\ sin\ i\ cos\ i} = 1.8$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - FILL SLOPES

GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

PHONE 858 558-6900 - FAX 858 558-6159

CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 04 - 07 - 2020	PROJECT NO. 07524 - 32 - 02	FIG. 7

Plotted:05/28/2020 10:43AM | By:ALVIN LADRILLONO | File Location:Y:\1_GEOTECH\07000\07500\07524-32-02\2020-04-07\DETAILS\Slope Stability Analyses-Surficial (SSAS-F).dwg

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	=	Infinite
DEPTH OF SATURATION	Z	=	3 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)	
SLOPE ANGLE	i	=	26.6 degrees
UNIT WEIGHT OF WATER	γ_w	=	62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	=	135 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	=	40 degrees
APPARENT COHESION	C	=	500 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ cos^2\ i\ tan\ \phi}{\gamma_t\ Z\ sin\ i\ cos\ i} = 4.0$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - CUT SLOPES

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 04 - 07 - 2020	PROJECT NO. 07524 - 32 - 02	FIG. 8

Plotted:05/28/2020 10:42AM | By:ALVIN LADRILLONO | File Location:Y:\1_GEOTECH\07000\07500\07524-32-02\2020-04-07\DETAILS\Slope Stability Analyses-Surficial (SSAS-C).dwg

Carroll Canyon Mine
CA Mine ID # 91-37-0029

SMARA Section 3500 – 3505 and 3700 – 3713 Requirements

§ 3502 The Reclamation Plan

(a) Objectives. Reclamation plans shall be developed to attain the objectives of Public Resources Code Section 2712(a)–(c).

Public Resources Code Section 2712(a)-(c) states:

> *It is the intent of the Legislatures to create and maintain an effective and comprehensive surface mining and reclamation policy with regulation of surface mining operations so as to assure that:*
>
> *(a) Adverse environmental effects are prevented or minimized and the mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses.*
> *(b) The production and conservation of minerals are encouraged, while giving consideration to values relative to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.*
> *(c) Residual hazards to the public and safety are eliminated.*

As demonstrated in the Stone Creek EIR, the proposed CUP/Reclamation Plan Amendment will not result in significant impacts. Mining at the site will not result in significant impacts to wildlife or water quality. As part of the proposed amendment to the Reclamation Plan, an extensive landscaping plan has been developed which will ensure that the mined site is revegetated and treated in an aesthetically pleasing manner.

(b) Reclamation Plan Elements. In addition to the information required by Public Resources Code Section 2772, the following elements shall be included in the proposed Reclamation Plan Amendment:

(1) The environmental setting of the site of operations and the effect that possible alternate reclaimed site conditions may have upon the existing and future uses of surrounding lands.

The Environmental Setting for the site is described in Section 2.0, *Environmental Setting*, of the Stone Creek EIR. Section 3.0, *Project Description*, of the EIR describes the amendment to the CUP and Reclamation Plan. Alternatives to the proposed CUP/Reclamation Plan Amendment are addressed in Section 10.0 of the EIR.

(2) The public health and safety, giving consideration to the degree and type of present and probable future exposure of the public to the site.

Public, health and safety are addressed in Section 5.6, *Health and Safety*, of the EIR. An analysis of health risks is addressed in the Air Quality Report for the project and included in Section 5.3, *Air Quality*, of the Stone Creek EIR.

(3) The designed steepness and proposed treatment of the mined lands' final slopes shall take into consideration the physical properties of the slope material, its probable maximum water content, landscaping requirements, and other factors. In all cases, reclamation plans shall specify slope angles

flatter than the critical gradient for the type of material involved. Whenever final slopes approach the critical gradient for the type of material involved, regulatory agencies shall require an engineering analysis of the slope stability. Special emphasis on slope stability and design shall be necessary when public safety or adjacent property may be affected.

The final reclamation slopes vary between 2:1 and approximately 3:1, which is well below the critical gradient. Additionally, a ten-foot wide bench of existing slope is being left untouched along the north and western site perimeter to ensure adequate stability within the adjacent private residential properties. Final grading shall meet the City of San Diego Grading (Land Development) Ordinance.

(4) Areas mined to produce additional materials for backfilling and grading, as well as settlement of filled areas, shall be considered in the reclamation plan. Where ultimate site uses include roads, building sites, or other improvements sensitive to settlement, the reclamation plans shall include compaction of the fill materials in conformance with good engineering practice.

The Reclamation Plan includes compaction of fill materials in accordance with Carroll Canyon Mine (CA Mine ID # 91-37-0029) and in conformance with State and local requirements.

As presented in Section 5.1.4 in the *Recommended Grading Specifications Carroll Canyon Mine, Vulcan Materials Company San Diego California* (June 3, 2020), included with Appendix C of this document, included as the site should be brought to final elevations with structural fill compacted in layers. Layers of fill should be no thicker than will allow for adequate bonding and compaction. All fill, including backfill and scarified ground surfaces, should be compacted to at least 90 percent of maximum dry density, at or above, optimum moisture content, as determined in accordance with ASTM Test Procedure D 1557-02. Fill materials near and/or below optimum moisture content may require additional moisture conditioning prior to placing additional fill. Fills less than 50 feet thick should be compacted to at least 90 percent of the maximum dry density at optimum moisture content or slightly above. Fills greater than 50 feet thick should be compacted to at least 93 percent of the laboratory maximum dry density at approximately two percent above optimum moisture content.

(5) Disposition of old equipment.

Upon termination of mining activities, mining equipment will be removed from the site. A detailed description and cost estimate for removal of all equipment and structures is included in the Proposed Financial Assurances Estimate (see attached Appendix A). Asphalt and concrete batch plants will remain in the southeast portion of the site until expiration of the Conditional Use Permit in 2032. No buildings will remain on-site.

(6) Temporary stream or watershed diversions.

The Reclamation Plan will require the temporary diversion of Carroll Canyon Creek in order to improve and enhance the ultimate creek design. During final reclamation plan grading activities, Carroll Canyon Creek will be temporarily diverted and rerouted from its existing alignment into its final alignment through the property. The rerouting of the creek will be conducted during the dry season. If construction activities extend into the wet season, appropriate best management practices for erosion control will be utilized to maintain stable steam banks and bed.

(c) Adequacy. In judging the adequacy of a particular reclamation plan in meeting the requirements described herein and within the Act, the lead agency shall consider the physical and land-use characteristics of the mined lands and their surrounding area pursuant to Public Resources Code Section 2773.

Noted.

(d) Each surface mining operation as defined in Public Resources Code Section 2735 and Title 14 California Code of Regulations Section 3501, shall have no more than one approved reclamation plan applicable to that operation except as described in subsection (i) to this section. An amended reclamation plan shall be approved by the lead agency prior to the commencement of activities determined to be a substantial deviation from the approved plan. For purposes of the Surface Mining and Reclamation Act of 1975 and regulations adopted pursuant thereto, a substantial deviation shall be defined as a change or expansion to a surface mining operation that substantially affects the completion of the previously approved reclamation plan, or that changes the end use of the approved plan to the extent that the scope of the reclamation required for the surface mining operation is substantially changed. In determining whether a change or expansion constitutes a substantial deviation, the lead agency shall take into consideration the following factors:

(1) A substantial increase in the disturbance of a surface area or in the maximum depth of mining;
(2) A substantial extension of the termination date of the mining operation as set out in the approved reclamation plan;
(3) Changes that would substantially affect the approved end use of the site as established in the reclamation plan;
(4) The consistency of any proposed change to the operation with the previously adopted environmental determinations.
(5) Any other changes that the lead agency deems substantial deviations as defined in the subsection.

Noted. The proposed CUP/Reclamation Plan Amendment will not be implemented until approved by the San Diego City Council and all other agency permits, as applicable, have been obtained.

(e) An amended reclamation plan shall be filed if the lead agency determines, after an inspection, that the surface mining operation can no longer be reclaimed in accordance with its approved reclamation plan. Such amended plan shall incorporate current reclamation standards as described in Chapter 9 (commencing with Section 2710) and Title 14 of the California code of Regulations commencing with Section 3700.

Noted. The project proposes an amendment to the approved CUP/Reclamation Plan to allow a more efficient mining of the site and to ready the site in a manner that is adaptable for the anticipated end use of the site. Current mining is occurring in accordance with the approved CUP. Reclamation of the site is occurring and will continue as mining is completed. Mine reclamation would be initiated at the earliest possible time on those portions of the mined lands that would not be subject to further disturbance by the surface mining operation. Should the proposed CUP/Reclamation Plan not be approved, the site would be reclaimed in accordance with the approved Reclamation Plan.

The approved CUP is being amended to allow for continued phased mining operations for 30 years after approval; allow for grading or grading modification to the 1981 Reclamation Plan to accommodate the relocation,

restoration/enhancement of Carroll Canyon Creek through the project site; and to reclaim the mined land in a manner that is adaptable for anticipated end use of the site.

(f) In the event that a proposed change is determined not to be a substantial deviation from an approved reclamation plan, then current reclamation standards need only apply to the amended portion of the plan. An amendment to the originally approved reclamation plan that includes an expanded operating area shall be approved by the lead agency prior to implementation of the activities in the expansion area.

Does not apply. As stated above, the project proposes and amendment to the approved CUP/Reclamation Plan to allow a more efficient mining of the site and to ready the site in a manner that is adaptable for the anticipated end use of the site. Current mining is occurring in accordance with the approved CUP. On-going reclamation of the site is occurring and will continue as mining is completed. Should the proposed CUP/Reclamation Plan not be approved, the site would be reclaimed in accordance with the approved Reclamation Plan. No expansion of the area where mining operations will occur is proposed.

(g) Should an expansion of an operation into an area not covered by an approved reclamation plan be determined by the lead agency to be a substantial deviation, an amended reclamation plan shall be prepared that ensures adequate reclamation for the surface mining operation. The amended reclamation plan shall incorporate current reclamation standards for the entire area governed by the plan that is impacted by the deviation. If reclamation has been substantially initiated at the time that a lead agency determines that an amended reclamation plan is required, the operator may complete reclamation of those areas according to the previously approved reclamation plan, except for those areas that are or will be affected by the proposed expanded mining activities which shall be subject to the requirements of the amended reclamation plan.

Does not apply. No expansion of the area where mining operations will occur is proposed.

(h) Where a surface mining operation has in effect an approved reclamation plan and approved financial assurance covering a surface mining operation, and the mining operator proposes to utilize a new surface area, not included within the approved reclamation plan, for purposes of creating a new and separate pit, quarry, or other excavation, the operator may, at the option of the operator do one of two things:

(1) Amend the existing reclamation plan to encompass the new area designated for use as a pit, quarry, or excavation, together with any other changes necessary to make the reclamation plan, as amended, conform to the Act and these regulations. If such an amended plan is proposed, the amended plan must conform to the current reclamation standards required by the Act and the regulations, as to the new area(s) designated as a quarry, pit or excavation and any processing facilities, roads, sumps, drainage systems or storage or processing areas, which that new area will utilize within the previously approved reclamation plan area or within the new area. Concurrently with the approval of the amended reclamation plan to encompass the new area operations, unless such a provision already is in the existing reclamation plan, the lead agency may require an amendment to the existing reclamation plan to provide for the immediate commencement of the reclamation of any mined lands which no longer are required for mining operations.

(2) Obtain approval of a new reclamation plan covering the new area and any facilities, roads, sumps, drainage systems, or storage or processing areas, utilized in connection with operations in the new area.

Any areas encompassed within such plan shall conform to the reclamation standards of the Act and these regulations that are in effect at the time the reclamation plan is approved.

Does not apply. No expansion of the area where mining operations will occur is proposed.

(i) The following exemptions to this section shall apply:

(1) Where a single surface mining operation has separate facilities located within different lead agency jurisdictions, and where these facilities are separated by a distinct and significant physical boundary such as a major highway, stream channel, or the like, the operator may obtain separate reclamation plans and financial assurances for the facilities from the lead agencies in which those facilities are located.
(2) Those surface mining operations that have more than one reclamation plan approved on or before October 1, 2002 shall not be subject to the requirements for a single reclamation plan as described in subsection (d) of this section unless new mining operations or substantial deviations to the operation are proposed after that date that require one of the plans to be amended.

Does not apply.

§ 3503. Surface Mining and Reclamation Practice.

The following are minimum acceptable practices to be followed in surface mining operations:

(a) Soil Erosion Control.

(1) The removal of vegetation and overburden, if any, in advance of surface mining shall be kept to the minimum.
(2) Stockpiles of overburden and minerals shall be managed to minimize water and wind erosion.
(3) Erosion control facilities such as retarding basins, ditches, streambank stabilization, and diking shall be constructed and maintained where necessary to control erosion.

Vegetation and overburden has been removed in advance of surface mining activities in accordance with the approved CUP. Any overburden and minerals that are stockpiled on the site are managed for water and erosion control consistent with State and local requirements. Erosion control facilities include settling ponds and basins. These facilities are maintained to control erosion and storm water runoff.

(b) Water Quality and Watershed Control.

(1) Settling ponds or basins shall be constructed to prevent potential sedimentation of streams at operations where they will provide a significant benefit to water quality.
(2) Operations shall be conducted to substantially prevent siltation of ground-water recharge areas.

Settling basins have been planned throughout the property to prevent siltation of Carroll Canyon Creek and manage erosion within the property. Mining operations are conducted in a manner that substantially prevent siltation in the adjacent Carroll Canyon Creek. The proposed revegetation plan will provide short and long-term erosion control throughout the property through the utilization of appropriate native species.

(c) Protection of Fish and Wildlife Habitat. All reasonable measures shall be taken to protect the habitat of fish and wildlife.

All reasonable measures have been implemented to protect wetland resources and/or mitigate for impacts to wetlands. The proposed revegetation plan utilizes a full range of native species appropriate for the creation of upland and wetland vegetation communities suitable for wildlife habitat. Protection of existing habitat values is focused on protecting downstream habitats through the use of onsite water quality and erosion control best management practices.

Wetland habitat occurring on-site is limited. Restoration of affected habitat will occur in accordance with local, state, and federal regulations. Best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1601 of the California Fish and Game Code.

(d) Disposal of Mine Waste Rock and Overburden. Permanent piles or dumps of mine waste rock and overburden shall be stable and shall not restrict the natural drainage without suitable provisions for diversion.

Does not apply. The project does not involve permanent piles or dumps of mine waste rock and overburden.

(e) Erosion and Drainage. Grading and revegetation shall be designed to minimize erosion and to convey surface runoff to natural drainage courses or interior basins designed for water storage. Basins that will store water during periods of surface runoff shall be designed to prevent erosion of spillways when these basins have outlet to lower ground.

Grading and revegetation associated with the Reclamation Plan has been designed to minimize erosion and to convey surface runoff to natural drainage courses. The Reclamation Plan does not propose permanent water storage basins. Depressions where water can collect during periods of heavy rainfall have been designed and occur in areas such that erosion of spillways will not occur. The basin within the western portion of the property has been designed with a pump system to minimize long periods of standing water and vector control issues.

(f) Resoiling. When the reclamation plan calls for resoiling, coarse hard mine waste shall be leveled and covered with a layer of finer material or weathered waste. A soil layer shall then be placed on this prepared surface. Surface mines that did not salvage soil during their initial operations shall attempt, where feasible, to upgrade remaining materials. The use of soil conditioners, mulches, or imported topsoil shall be considered where revegetation is part of the reclamation plan and where such measures appear necessary. It is not justified, however, to denude adjacent areas of their soil, for any such denuded areas must in turn be reclaimed.

Laboratory tests of final surface soils shall provide direction regarding the appropriate soil conditioners and quantities necessary to improve the soils nutrients and structure to support revegetation efforts.

(g) Revegetation. When the reclamation plan calls for revegetation the available research addressing revegetation methods and the selection of species having good survival characteristics, for the topography, resoiling characteristics, and climate of the mined areas shall be used.

The Carroll Canyon Conditional Use Permit (CUP) Reclamation Plan establishes the reclamation landscaping of the site. The Reclamation Plan Landscape Development Plan includes revegetation with plant species that are commercially available for erosion control, native plants that have evidenced good success on disturbed soils, and plant species that are consistent with vegetation used in the region for this purpose. Tables 1 through 6 display the proposed revegetation seed and container plant palettes for the various revegetation areas from which species would be selected. The tables below indicate the approximate seed rates, planting densities, and composition. Landscape plans for reclamation, including cross sections and sample plots, are illustrated on Sheets 7 through 13 of the Carroll Canyon Mine (CA Mine ID # 91-37-0029) Reclamation Plan.

Upper Buffer

Upper Buffer plantings will occur along the boundaries of the Carroll Canyon Reclamation Plan project site to act as a ten-foot buffer between the project site and existing development surrounding the site. The Upper Buffer vegetation will occur along the western, eastern, and northern boundary, as well as the southern boundary, east of Camino Ruiz. Table 1, below, indicates the approximate seed rates, planting densities, and composition.

South/West Facing Slopes

South/West Facing Slopes created as part of the Reclamation Plan occur west of Camino Ruiz will occur north, east, and west of the large on-site desiltation basin, as well as south of the desiltation basin between the north/east facing slopes and creek slopes. East of Camino Ruiz, South/West Facing Slopes will occur along the northern edge of the project site (south of the Upper Buffer), north of the Carroll Canyon corridor and the southeast fork of the creek corridor, along the eastern edge of Camino Ruiz, as well as two slight finger reaching eastward from Camino Ruiz. Table 2, below, indicates the approximate seed rates, planting densities, and composition.

Table 1. Hydroseed Mix and Container Plants for the Upper Buffer

Species	Common Name	Lbs/Acre
Artemisia californica	California sagebrush	2.0
Baccharis pilularis[2]	Coyote brush	container plant
Baccharis sarothroides[2]	Desertbroom	container plant
Bromus carinatus	California brome	1.0
Ceanothus crassifolius[2]	Hoaryleaf ceanothus	container plant
Ceanothus cuneatus[2]	Buckbrush	container plant
Ceanothus tomentosus[2]	Woollyleaf ceanothus	container plant
Ceanothus verrucosus[2]	White coast ceanothus	container plant
Encelia californica	Coast sunflower	1.0
Epilobium canum	California fuchsia	0.5
Eriodictyon crassifolium[2]	Thick-leaf Yerba Santa	container plant
Eriogonum fasciculatum	California buckwheat	3.0
Hemizonia fasciculata	Clustered tarweed	0.5
Heteromeles arbutifolia[2]	Toyon	container plant
Leymus condensatus[2]	Canyon Price	container plant
Lotus scoparius[1]	Deerweed	3.0
Malosma laurina[2]	Laurel sumac	container plant
Mimulus aurantiacus	Sticky monkey flower	1.0
Opuntia littoralis	Prickly pear cactus	container plant
Opuntia parryi serpentina	Snake cholla	container plant
Pinus torreyana[2]	Torrey pine	container plant
Plantago ovata[1]	Desert indianwheat	3.0
Quercus agrifolia[2]	Coast live oak	container plant
Quercus berberidifolia[2]	California scrub oak	container plant
Quercus dumosa[2]	Coastal sage scrub oak	container plant
Rhus integrifolia[2]	Lemonadeberry	container plant

Salvia apiana[2]	White sage	container plant
Salvia mellifera[2]	Black sage	container plant
Sambucus mexicana[2]	Mexican elderberry	container plant
Viguiera laciniata	San Diego sunflower	1.0
Vulpia microstachys[1]	Small fescue	3.0
Xylococcus bicolor[2]	Mission manzanita	container plant
Yucca whipplei[2]	Chaparral yucca	container plant

[1] Intended to meet the 100% coverage within 2-year requirement

[2] Intended to meet the requirement of a minimum of 50% of the total slope area shall be planted with deep rooting groundcovers (i.e. those with a typical root depth of five feet or greater). For seeded plantings, at least 50% of the viable seed count shall be deep rooting species.

Table 2. Hydroseed Mix and Container Plants for the South/West Facing Slopes

Species	Common Name	Lbs/Acre
Ambrosia psilostachya[1]	Cuman ragweed	2.0
Artemisia californica	California sagebrush	2.0
Baccharis pilularis[2]	Coyote brush	container plant
Baccharis sarothroides[2]	Desertbroom	container plant
Bromus carinatus	California brome	1.0
Ceanothus crassifolius[2]	Hoaryleaf ceanothus	container plant
Ceanothus cuneatus[2]	Buckbrush	container plant
Ceanothus tomentosus[2]	Woollyleaf ceanothus	container plant
Ceanothus verrucosus[2]	White coast ceanothus	container plant
Cercocarpus betuloides[2]	California mountain mahogany	container plant
Encelia californica	Coast sunflower	1.0
Encelia farinosa	Brittlebrush	1.0
Epilobium canum	California fuchsia	0.5
Ericameria linearifolia	Narrowleaf goldenbush	1.0
Eriodictyon crassifolium[2]	Thick-leaf Yerba Santa	container plant
Eriogonum fasciculatum	California buckwheat	3.0
Eschscholzia californica	California poppy	1.0
Hazardia squarrosa	Sawtooth goldenbush	1.0
Hemizonia fasciculata	Clustered tarweed	2.0
Heteromeles arbutifolia[2]	Toyon	container plant
Isocoma menziesii	Coastal goldenbush	1.0
Isomeris arborea	Bladderpod	0.5
Leymus condensatus[2]	Canyon Price	container plant
Lotus scoparius[1]	Deerweed	3.0
Lupinus bicolor	Bicolored lupine	0.5
Lupinus succulentus	Arroyo lupine	0.5
Malosma laurina[2]	Laurel sumac	container plant
Mimulus aurantiacus	Sticky monkey flower	1.0
Opuntia littoralis	Prickly pear cactus	container plant
Opuntia parryi serpentina	Snake cholla	container plant
Pinus torreyana[2]	Torrey pine	container plant
Plantago ovata[1]	Desert indianwheat	3.0
Quercus agrifolia[2]	Coast live oak	container plant
Quercus berberidifolia[2]	California scrub oak	container plant
Quercus dumosa[2]	Coastal sage scrub oak	container plant
Rhus integrifolia[2]	Lemonadeberry	container plant
Salvia apiana[2]	White sage	container plant
Salvia mellifera[2]	Black sage	container plant
Sambucus mexicana[2]	Mexican elderberry	container plant
Viguiera laciniata	San Diego sunflower	1.0

Vulpia microstachys[1]	Small fescue	3.0
Xylococcus bicolor[2]	Mission manzanita	container plant
Yucca whipplei[2]	Chaparral yucca	container plant

[1] Intended to meet the 100% coverage within 2-year requirement

[2] Intended to meet the requirement of a minimum of 50% of the total slope area shall be planted with deep rooting groundcovers (i.e. those with a typical root depth of five feet or greater). For seeded plantings, at least 50% of the viable seed count shall be deep rooting species.

North/East Facing Slopes

North/East Facing Slopes created as part of the Reclamation Plan occur west of Camino Ruiz will occur south of the large desiltation basin, on the south side of the Carroll Canyon corridor, and along the southeastern edge of the project site. Table 3, below, indicates the approximate seed rates, planting densities, and composition.

Table 3. Hydroseed Mix and Container Plants for the North/East Facing Slopes

Species	Common Name	Lbs/Acre
Baccharis pilularis[2]	Coyote brush	container plant
Baccharis sarothroides[2]	Desertbroom	container plant
Ceanothus crassifolius[2]	Hoaryleaf ceanothus	container plant
Ceanothus cuneatus[2]	Buckbrush	container plant
Ceanothus tomentosus[2]	Woollyleaf ceanothus	container plant
Ceanothus verrucosus[2]	White coast ceanothus	container plant
Cercocarpus betuloides[2]	California mountain mahogany	container plant
Epilobium canum	California fuchsia	0.5
Heteromeles arbutifolia[2]	Toyon	container plant
Isomeris arborea[1]	Bladderpod	0.5
Leymus condensatus[2]	Canyon Price	container plant
Lotus scoparius[1]	Deerweed	3.0
Malosma laurina[2]	Laurel sumac	container plant
Mimulus aurantiacus	Sticky monkey flower	1.0
Plantago ovata[1]	Desert indianwheat	3.0
Quercus agrifolia[2]	Coast live oak	container plant
Quercus berberidifolia[2]	California scrub oak	container plant
Quercus dumosa[2]	Coastal sage scrub oak	container plant
Rhus integrifolia[2]	Lemonadeberry	container plant
Salvia mellifera[2]	Black sage	container plant
Viguiera laciniata	San Diego sunflower	1.0
Vulpia microstachys[1]	Small fescue	3.0

[1] Intended to meet the 100% coverage within 2-year requirement

[2] Intended to meet the requirement of a minimum of 50% of the total slope area shall be planted with deep rooting groundcovers (i.e. those with a typical root depth of five feet or greater). For seeded plantings, at least 50% of the viable seed count shall be deep rooting species.

Creek Slope

Creek Slope plantings will create a ten-foot buffer primarily along the riparian areas of Carroll Canyon CUP. This landscaping will be located around the large on-site desiltation basin and along the edge of the creek corridor. West of Camino Ruiz, Creek Slope plantings will occur south of the South/West Facing Slopes in the eastern portion of this part of the project site, as well as along the southern boundary of the eastern portion of this part of the project site. Table 4, below, indicates the approximate seed rates, planting densities, and composition.

Table 4. Hydroseed Mix and Container Plants for the Creek Slope

Species	Common Name	Lbs/Acre
Ambrosia psilostachya[1]	Cuman ragweed	2.0
Artemisia douglasiana	Mugwort	1.0
Baccharis pilularis[2]	Coyote brush	container plant
Baccharis salicifolia[2]	Mulefat	container plant
Baccharis sarothroides[2]	Desertbroom	container plant
Epilobium canum	California fuchsia	0.5
Heteromeles arbutifolia[2]	Toyon	container plant
Isomeris arborea	Bladderpod	0.5
Iva hayesiana[2]	San Diego povertyweed	container plant
Leymus condensatus[2]	Canyon Price	container plant
Leymus triticoides[2]	Beardless wild rye	container plant
Lotus scoparius[1]	Deerweed	3.0
Lupinus bicolor	Bicolored lupine	0.5
Lupinus succulentus	Arroyo lupine	0.5
Mimulus aurantiacus	Sticky monkey flower	1.0
Muhlenbergia rigens	Deer grass	0.5
Muhlenbergia microsperma	Littleseed muhly	1.0
Oenothera elata var. hirsutissima	Evening primrose	1.0
Plantago ovata[1]	Desert indianwheat	3.0
Quercus agrifolia[2]	Coast live oak	container plant
Rhus integrifolia[2]	Lemonadeberry	container plant
Salix lasiolepis[2]	Arroyo willow	container plant
Salvia mellifera[2]	Black sage	container plant
Sambucus mexicana[2]	Mexican elderberry	container plant
Viguiera laciniata	San Diego sunflower	1.0
Vulpia microstachys[1]	Small fescue	3.0

[1] Intended to meet the 100% coverage within 2-year requirement

[2] Intended to meet the requirement of a minimum of 50% of the total slope area shall be planted with deep rooting groundcovers (i.e. those with a typical root depth of five feet or greater). For seeded plantings, at least 50% of the viable seed count shall be deep rooting species.

Creek Bottom

The Carroll Canyon corridor runs roughly the length of the Carroll Canyon Reclamation Plan site. Creek Bottom landscaping will occur along the creekbed, as well as the southeastern edge of the project site west of Camino Ruiz. Table 5, below, indicates the approximate seed rates, planting densities, and composition.

Table 5. Hydroseed Mix and Container Plants for the Creek Bottom

Species	Common Name	Lbs/Acre
Ambrosia psilostachya[1]	Cuman ragweed	2.0
Artemisia douglasiana	Mugwort	1.0
Baccharis salicifolia[2]	Mulefat	container plant
Iva hayesiana	San Diego povertyweed	container plant
Leymus condensatus[2]	Canyon Price	container plant
Leymus triticoides[2]	Beardless wild rye	container plant
Lotus scoparius[1]	Deerweed	3.0
Muhlenbergia rigens[2]	Deer grass	1.0
Muhlenbergia microsperma[2]	Littleseed muhly	1.0
Oenothera elata var hirsutissima	Evening primrose	1.0
Plantago ovata[1]	Desert indianwheat	3.0
Platanus racemosa[2]	California sycamore	container plant
Populus fremontii[2]	Fremont cottonwood	container plant
Quercus agrifolia[2]	Coast live oak	container plant

Salix exigua[2]	Narrowleaf willow	container plant
Salix gooddingii[2]	Goodding's willow	container plant
Salix lasiolepis[2]	Arroyo willow	container plant
Salix lucida ssp. lasaindra[2]	Pacific willow	container plant
Sambucus mexicana[2]	Mexican elderberry	container plant
Vulpia microstachys[1]	Small fescue	3.0

[1] Intended to meet the 100% coverage within 2-year requirement

[2] Intended to meet the requirement of a minimum of 50% of the total slope area shall be planted with deep rooting groundcovers (i.e. those with a typical root depth of five feet or greater). For seeded plantings, at least 50% of the viable seed count shall be deep rooting species.

Flat Pads

The remainder of the Carroll Canyon Reclamation Plan project site will be graded as flat pads and landscaped with a hydroseed mix. Table 6, below, indicates the approximate seed rates, planting densities, and composition.

Table 6. Hydroseed Mix for the Flat Pads

Species	Common Name	Lbs/Acre
Ambrosia psilostachya[1]	Cuman ragweed	1.0
Bromus carinatus	California brome	1.0
Eschscholzia californica	California poppy	1.0
Isocoma menziesii	Coastal goldenbush	1.0
Hazardia squarrosa	Sawtooth goldenbush	1.0
Hemizonia fasciculata	Clustered tarweed	1.0
Lotus scoparius[1]	Deerweed	3.0
Lupinus bicolor	Bicolored lupine	0.5
Lupinus succulentus	Arroyo lupine	0.5
Mimulus aurantiacus	Sticky monkey flower	1.0
Muhlenbergia rigen[1]	Deer grass	1.0
Muhlenbergia microsperma[1]	Littleseed muhly	1.0
Nassella lepida[1]	Foothill needlegrass	1.0
Nassella pulchra[1]	Purple needlegrass	1.0
Plantago ovata[1]	Desert indianwheat	3.0
Trifolium tridentatum[1]	Tomcat clover	2.0
Vulpia microstachys[1]	Small fescue	3.0

[1] Intended to meet the 100% coverage within 2-year requirement

§ 3702. Financial Assurances.

Lead agencies shall require financial assurances for reclamation in accordance with Public Resources Code section 2773.1 to ensure that reclamation is performed in accordance with the approved reclamation plan and with this article.

Financial Assurance is on-file with the City of San Diego, 1222 First Avenue, San Diego, CA 92101.

§ 3703. Performance Standards for Wildlife Habitat.

Wildlife and vegetation occurring on the project site, as well as potential impacts, are addressed in the Biological Technical Report and Section 5.5, *Biological Resources*, of the Stone Creek EIR.

Wildlife and wildlife habitat shall be protected in accordance with the following standards:

(a) Rare, threatened or endangered species as listed by the California Department of Fish and Game, (California Code of Regulations, Title 14, sections 670.2 - 670.5) or the U. S. Fish and Wildlife Service, (50 CFR 17.11 and

17.12) or species of special concern as listed by the California Department of Fish and Game in the Special Animals List, Natural Diversity Data Base, and their respective habitat, shall be conserved as prescribed by the federal Endangered Species Act of 1973, 16 U.S.C. section 1531 et. seq., and the California Endangered Species Act, Fish and Game Code section 2050 et seq. If avoidance cannot be achieved through the available alternatives, mitigation shall be proposed in accordance with the provisions of the California Endangered Species Act, Fish and Game Code section 2050 et seq., and the federal Endangered Species Act of 1973, 16 U.S.C. section 1531 et seq.

No rare, threatened or endangered species occur on the site. Impacts to rare, threatened or endangered species will not occur as a result of reclamation activities.

(b) Wildlife habitat shall be established on disturbed land in a condition at least as good as that which existed before the lands were disturbed by surface mining operations, unless the proposed end use precludes its use as wildlife habitat or the approved reclamation plan establishes a different habitat type than that which existed prior to mining.

Native vegetation will be established within the Carroll Canyon Creek, as shown on revegetation plans. Restored portions of Carroll Canyon Creek will be conserved where wildlife habitat can occur. Performance standards for the restoration of Carroll Canyon Creek are contained in the Carroll Canyon Creek Enhancement Plan.

(c) Wetland habitat shall be avoided. Any wetland habitat impacted as a consequence of surface mining operations shall be mitigated at a minimum of one to one ratio for wetland habitat acreage and wetland habitat value.

Wetland habitat occurring on-site is limited. Restoration of affected habitat will occur in accordance with local, state, and federal regulations. Best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1601 of the California Fish and Game Code.

§ 3704. Performance Standards for Backfilling, Regrading, Slope Stability, and Recontouring.

Backfilling, regrading, slope stabilization, and recontouring shall conform with the following standards:

(a) Where backfilling is proposed for urban uses (e.g., roads, building sites, or other improvements sensitive to settlement), the fill material shall be compacted in accordance with the Uniform Building Code, published by the International Conference of Building Officials and as adopted by the lead agency, the local grading ordinance, or other methods approved by the lead agency as appropriate for the approved end use.

As applicable, where backfilling is proposed for urban uses (e.g., roads, building sites, or other improvements sensitive to settlement), fill material will be compacted in accordance with the Uniform Building Code, published by the International Conference of Building Officials and as adopted by the City of San Diego.

In accordance with §141.1006(a)(6) of the San Diego Municipal Code, onsite excavation and earthmoving (including grading, compaction, and creation of fills) are subject to the following conditions:

- All required permits for the construction, landscaping, or related land improvements have been

approved by a public agency in accordance with applicable provisions of State law and locally adopted plans and ordinances, including, but not limited to, PRC Division 13 (commencing with Section 21000).

- The lead agency's approval of the construction project included consideration of onsite excavation and onsite earthmoving activities pursuant to PRC Division 12 (commencing with Section 21000).
- The approved construction project is consistent with the General Plan or zoning of the premises.
- Surplus materials shall not be exported from the premises unless and until actual construction work has commenced and shall cease if it is determined that construction activities have terminated, have been indefinitely suspended, or are no longer being actively pursued.

As presented in Section 5.1.4 in the *Recommended Grading Specifications Carroll Canyon Mine, Vulcan Materials Company San Diego, California* (June 3, 2020) included with Appendix C of this document, the site should be brought to final elevations with structural fill compacted in layers. Layers of fill should be no thicker than will allow for adequate bonding and compaction. All fill, including backfill and scarified ground surfaces, should be compacted to at least 90 percent of maximum dry density, at or above, optimum moisture content, as determined in accordance with ASTM Test Procedure D 1557-02. Fill materials near and/or below optimum moisture content may require additional moisture conditioning prior to placing additional fill. Fills less than 50 feet thick should be compacted to at least 90 percent of the maximum dry density at optimum moisture content or slightly above. Fills greater than 50 feet thick should be compacted to at least 93 percent of the laboratory maximum dry density at approximately two percent above optimum moisture content.

(b) Where backfilling is required for resource conservation purposes (e.g., agriculture, fish and wildlife habitat, and wildland conservation), fill material shall be backfilled to the standards required for the resource conservation use involved.

As applicable, where backfilling is proposed for resource conservation purposes (e.g. agriculture, fish and wildlife habitat, and wildland conservation), fill material will be compacted in accordance with the Uniform Building Code, published by the International Conference of Building Officials and as adopted by the City of San Diego. In addition, the project will comply with the following FEMA design requirements, as applicable, to ensure safety from flooding, pursuant to FEMA Technical Bulletin 10-01, *Ensuring That Structures Built on Fill In or Near Special Flood Hazard Areas Are Reasonably Safe From Flooding*:

- The ground surface around the building and within a defined setback distance from the edge of the Special Flood Hazard Area (SFHA) must be at or above the base flood elevation (BFE).
- The setback is the distance from the edge of the SFHA to the nearest wall of the basement. The minimum allowable setback distance is 20 feet.
- The ground around the building must be compacted fill; the fill material—or soil of similar classification and degree of permeability—must extend to at least five feet below the bottom of the basement floor slab.
- The fill material must be compacted to at least 95 percent of Standard Laboratory Maximum Dry Density (Standard Proctor), according to ASTM Standard D-698. Fill soils must be fine-grained soils of low permeability, such as those classified as CH, CL, SC, or ML according to ASTM Standard D-2487, *Classification of Soils for Engineering Purposes.* See Table 1804.2 in the 2000 *International Building Code* (IBC) for descriptions of these soil types.
- The fill material must be homogenous and isotropic; that is, the soil must be all of one material, and the engineering properties must be the same in all directions.

- The elevation of the basement floor should be no more than five feet below the BFE.
- There must be a granular drainage layer beneath the floor slab, and a ¼-horsepower sump pump with a backup power supply must be provided to remove the seepage flow. The pump must be rated at four times the estimated seepage rate and must discharge above the BFE and away from the building. This arrangement is essential to prevent flooding of the basement or uplift of the floor under the effect of the seepage pressure.
- The drainage system must be equipped with a positive means of preventing backflow.
- Model building codes (such as the 2000 International Residential Code) also address foundation drainage (IRC Section R405) and foundation walls (IRC Section R404). Model building codes generally allow foundation drains to discharge through either mechanical means or gravity drains. In addition, there is often an exception to the requirement for drainage systems in well-drained soils. However, in or near floodplains, well-drained soils can, in fact, help convey groundwater towards the building foundation. Therefore, this exception should not apply in or near floodplains.
- In some cases in or near floodplains, even with standard drainage systems, hydrostatic pressures from groundwater against the basement can result. When a standard drainage system is unable to eliminate hydrostatic pressure on the foundation, model building codes, including the 2000 International Residential Code (IRC Section 404.1.3), require that the foundation be designed in accordance with accepted engineering practice. The simplified approach contained in FEMA Technical Bulletin 10-01 assumes no hydrostatic pressure on the foundation and should be used only when a standard drainage system, discharged by a sump pump that is equipped with backup power and that discharges above BFE, is employed. For other drainage systems, the designer should use the engineered basement option presented on page 19 of FEMA Technical Bulletin 10-01 and other appropriate building code requirements.

(c) Piles or dumps of mining waste shall be stockpiled in such a manner as to facilitate phased reclamation. They shall be segregated from topsoil and topsoil substitutes or growth media salvaged for use in reclamation.

Piles will be stockpiled in such a manner as to facilitate phased reclamation.

(d) Final reclaimed fill slopes, including permanent piles or dumps of mine waste rock and overburden, shall not exceed 2:1 (horizontal:vertical), except when site-specific geologic and engineering analysis demonstrate that the proposed final slope will have a minimum slope stability factor of safety that is suitable for the proposed end use, and when the proposed final slope can be successfully revegetated.

Final reclaimed fill slopes will not exceed 2:1 (horizontal:vertical). All slopes proposed on the Reclamation Plan Amendment shall be 2:1 (horizontal:vertical) or flatter.

(e) At closure, all fill slopes, including permanent piles or dumps of mine waste and overburden, shall conform with the surrounding topography and/or approved end use.

As part of the Reclamation Plan, all manufactured slopes have been designed to conform to the surrounding topography and to leave the site in a manner that is adaptable for the anticipated end use.

(f) Cut slopes, including final highwalls and quarry faces, shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conform with the surrounding topography and/or approved

end use.

Perimeter cut slopes have been designed to provide some undulation and variation in landform to help them blend with nearby natural slopes. All cut slopes will have a minimum slope stability factor of safety that is suitable for the proposed end use. (See *Slope Stability Analysis for Reclamation Slopes, Carroll Canyon Mine, San Diego California*, GEOCON, June 3, 2020, included as Attachment A.) Permanent placement of mining materials (including mining waste and overburden) will not occur within wetland habitat areas.

§ 3704.1 Performance Standards for Backfilling Excavations and Recontouring Lands Disturbed by Open Pit Surface Mining Operations for Metallic Minerals

Does not apply. Metallic minerals are not mined at the site.

§ 3705. Performance Standards for Revegetation.

Revegetation shall be part of the approved plan, unless it is not consistent with the approved end use.

(a) A vegetative cover suitable for the proposed end use and capable of self-regeneration without continued dependence on irrigation, soil amendments or fertilizer shall be established on disturbed land unless an artificially maintained landscape is consistent with the approved reclamation plan. Vegetative cover or density, and species-richness shall be, where appropriate, sufficient to stabilize the surface against effects of long-term erosion and shall be similar to naturally occurring habitats in the surrounding area. The vegetative density, cover and species richness of naturally occurring habitats shall be documented in baseline studies carried out prior to the initiation of mining activities. However, for areas that will not be reclaimed to prior conditions, the use of data from reference areas in lieu of baseline site data is permissible.

(b) Test plots conducted simultaneously with mining shall be required to determine the most appropriate planting procedures to be followed to ensure successful implementation of the proposed revegetation plan. The lead agency may waive the requirement to conduct test plots when the success of the proposed revegetation plan can be documented from experience with similar species and conditions or by relying on competent professional advice based on experience with the species to be planted.

(c) Where surface mining activities result in compaction of the soil, ripping, disking, or other means shall be used in areas to be revegetated to eliminate compaction and to establish a suitable root zone in preparation for planting.

(d) Prior to closure, all access roads, haul roads, and other traffic routes to be reclaimed shall be stripped of any remaining roadbase materials, prepared in accordance with subsection 3705(g), covered with suitable growth media or topsoil, and revegetated. When it is not necessary to remove roadbase materials for revegetative purposes, lead agencies may set a different standard as specified in section 3700(b) of this Article.

(e) Soil analysis shall be required to determine the presence or absence of elements essential for plant growth and to determine those soluble elements that may be toxic to plants, if the soil has been chemically altered or if the growth media consists of other than the native topsoil. If soil analysis suggests that fertility levels or soil constituents are inadequate to successfully implement the revegetative program, fertilizer or other soil amendments may be incorporated into the soil. When native plant materials are used, preference shall be given to slow- release fertilizers, including mineral and organic materials that mimic natural sources, and shall be added in amounts similar to those found in reference soils under natural vegetation of the type being reclaimed.

(f) Temporary access for exploration or other short-term uses on arid lands shall not disrupt the soil surface except where necessary to gain safe access. Barriers shall be installed when necessary to gain safe access. Barriers shall be installed when necessary to prevent unauthorized vehicular traffic from interfering with the reclamation of temporary access routes.

(g) Native plant species shall be used for revegetation, except when introduced species are necessary to meet the end uses specified in the approved reclamation plan. Areas to be developed for industrial, commercial, or residential use shall be revegetated for the interim period, as necessary, to control erosion. In this circumstance, non-native plant species may be used if they are not noxious weeds and if they are species known not to displace native species in the area.

(h) Planting shall be conducted during the most favorable period of the year for plant establishment. (i) Soil stabilizing practices shall be used where necessary to control erosion and for successful plant establishment. Irrigation may be used when necessary to establish vegetation.

(j) If irrigation is used, the operator must demonstrate that the vegetation has been self-sustaining without irrigation for a minimum of two years prior to release of the financial assurances by the lead agency, unless an artificially maintained landscape is consistent with the approved end use.

(k) Noxious weeds shall be managed: (1) when they threaten the success of the proposed revegetation; (2) to prevent spreading to nearby areas; and (3) to eliminate fire hazard.

(l) Protection measures, such as fencing of revegetated areas and/or the placement of cages over individual plants, shall be used in areas where grazing, trampling, herbivory, or other causes threaten the success of the proposed revegetation. Fencing shall be maintained until revegetation efforts are successfully completed and the lead agency authorizes removal.

(m) Success of revegetation shall be judged based upon the effectiveness of the vegetation for the approved end use, and by comparing the quantified measures of vegetative cover, density, and species-richness of the reclaimed mined-lands to similar parameters of naturally occurring vegetation in the area. Either baseline data or data from nearby reference areas may be used as the standard for comparison. Quantitative standards for success and the location(s) of the reference area(s) shall be set forth in the approved reclamation plan. Comparisons shall be made until performance standards are met provided that, during the last two years, there has been no human intervention, including, for example, irrigation, fertilization, or weeding. Standards for success shall be based on expected local recovery rates. Valid sampling techniques for measuring success shall be specified in the approved reclamation plan. Sample sizes must be sufficient to produce at least an 80 percent confidence level. There are standard statistical methods in commonly available literature for determining an 80 percent confidence level on a site-by-site basis. Examples of such literature include, but are not limited to, D. Mueller-Dombois and H. Ellenberg, 1974, "Aims and Methods of Vegetation Ecology," John Wiley and Sons, Inc., or C. D. Bonham, 1988, "Measurements for Terrestrial Vegetation," John Wiley and Sons, Inc., and are available at many university libraries. The texts are also available at some local libraries through the Inter-Library Loan Program.

The proposed revegetation plan has been developed with a series of native plant palettes adapted from local vegetative communities with species expected to have good initial survival characteristics and long-term self-regeneration. Reference site will be utilized to establish vegetative density, cover and species richness targets for the various habitats targeted within the revegetation plan. Planting shall utilize a combination of container stock and hydroseeding applications to accomplish the desired characteristics and meet the success criteria. Before planting, compacted flatter areas of the site shall be ripped to a depth of 12 inches. All access/haul roads targeted for revegetation shall be stripped of any remaining roadbase and ripped to a depth of 12 inches. Laboratory tests of final surface soils shall provide direction regarding the appropriate soil conditioners and quantities necessary

to improve the soils nutrients and structure to support revegetation efforts. Planting shall occur between October 15th and April 15th to coincide with seasonal rainfall patterns. A temporary irrigation system is anticipated during initial plant establishment through the first three growing seasons. Weeding and other maintenance activities shall occur during the first five years after planting. Final success of the revegetation areas shall be based on specific perfromance criteria.

§ 3706. Performance Standards for Drainage, Diversion Structures, Waterways, and Erosion Control.

(a) Surface mining and reclamation activities shall be conducted to protect on-site and downstream beneficial uses of water in accordance with the Porter-Cologne Water Quality Control Act, Water Code section 13000, et seq., and the Federal Clean Water Act, 33 U.S.C. section 1251, et seq.

(b) The quality of water, recharge potential, and storage capacity of ground water aquifers which are the source of water for domestic, agricultural, or other uses dependent on the water, shall not be diminished, except as allowed in the approved reclamation plan.

(c) Erosion and sedimentation shall be controlled during all phases of construction, operation, reclamation, and closure of a surface mining operation to minimize siltation of lakes and watercourses, as required by the Regional Water Quality Control Board or the State Water Resources Control Board.

(d) Surface runoff and drainage from surface mining activities shall be controlled by berms, silt fences, sediment ponds, revegetation, hay bales, or other erosion control measures, to ensure that surrounding land and water resources are protected from erosion, gullying, sedimentation and contamination. Erosion control methods shall be designed to handle runoff from not less than the 20 year/l hour intensity storm event.

(e) Where natural drainages are covered, restricted, rerouted, or otherwise impacted by surface mining activities, mitigating alternatives shall be proposed and specifically approved in the reclamation plan to assure that runoff shall not cause increased erosion or sedimentation.

(f) When stream diversions are required, they shall be constructed in accordance with: (1) the stream and lake alteration agreement between the operator and the Department of Fish and Game; and (2) the requirements of the Federal Clean Water Act, Sections 301 (33 U.S.C. 1311) and Section 404 (33 U.S.C. 1344) and/or Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(g) When no longer needed to achieve the purpose for which they were authorized, all temporary stream channel diversions shall be removed and the affected land reclaimed.

No ground water resources within the vicinity of the property are utilized for domestic or agricultural purposes. Downstream beneficial uses of water relate primarily to wildlife habitat, with sediment being the primary pollutant of concern. The best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act and the Federal Clean Water Act.

§ 3707(a) – (d). Performance Standards for Prime Agricultural Land Reclamation.

Does not apply. The site is not designated as Prime Agricultural Lands.

§ 3708. Performance Standards for Other Agricultural Land

The following standards shall apply to agricultural lands, other than prime agricultural lands, when the approved end use is agriculture.

In addition to the standards for topsoil salvage, maintenance, and redistribution, non-prime agricultural lands shall be reclaimed so as to be capable of sustaining economically viable production of crops commonly grown in the surrounding areas.

Does not apply. The site is not agricultural lands, and the approved end use is not agriculture.

§ 3709. Performance Standards for Building, Structure, and Equipment Removal.

(a) All equipment, supplies, and other materials shall be stored in designated areas (as shown in the approved reclamation plan). All waste shall be disposed of in accordance with state and local health and safety ordinances.

(b) All buildings, structures, and equipment shall be dismantled and removed prior to final mine closure except those buildings, structures, and equipment approved in the reclamation plan as necessary for the end use.

At the time of reclamation, all equipment, supplies and other materials will be removed from the site and all waste will be disposed of in accordance with state and local health and safety ordinances. All buildings, structures, and equipment shall be dismantled and removed prior to final mine closure.

§ 3710. Performance Standards for Stream Protection, Including Surface and Groundwater.

(a) Surface and groundwater shall be protected from siltation and pollutants which may diminish water quality as required by the Federal Clean Water Act, sections 301 et seq. (33 U.S.C. section 1311), 404 et seq. (33 U.S.C. section 1344), the Porter- Cologne Act, section 13000 et seq., County anti-siltation ordinances, the Regional Water Quality Control Board or the State Water Resources Control Board.

(b) In-stream surface mining operations shall be conducted in compliance with Section 1600 et seq. of the California Fish and Game Code, section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(c) Extraction of sand and gravel from river channels shall be regulated to control channel degradation in order to prevent undermining of bridge supports, exposure of pipelines or other structures buried within the channel, loss of spawning habitat, lowering of ground water levels, destruction of riparian vegetation, and increased stream bank erosion (exceptions may be specified in the approved reclamation plan). Changes in channel elevations and bank erosion shall be evaluated annually using records of annual extraction quantities and benchmarked annual cross sections and/or sequential aerial photographs to determine appropriate extraction locations and rates.

(d) In accordance with requirements of the California Fish and Game Code section 1600 et seq., in-stream mining activities shall not cause fish to become entrapped in pools or in off-channel pits, nor shall they restrict spawning or migratory activities.

The project does not involve in-stream surface mining or extraction of sand and gravel from diver channels.

Surface and groundwater will be protected from siltation and pollutants which may diminish water quality as required by the Federal Clean Water Act, sections 301 et seq. (33 U.S.C. section 1311), 404 et seq. (33 U.S.C. section 1344), the Porter- Cologne Act, section 13000 et seq., County anti-siltation ordinances, the Regional Water Quality Control Board or the State Water Resources Control Board.

The best management practices for erosion control, the siltation basins, and the proposed revegetation all target the reduction of sediment reaching Carroll Canyon Creek and downstream habitat areas. All impacts and improvements relative the Carroll Canyon Creek will be done in accordance with the requirements of the Porter Cologne Act, the Federal Clean Water Act, and Section 1600 of the California Fish and Game Code.

§ 3711. Performance Standards for Topsoil Salvage, Maintenance, and Redistribution.

When the approved reclamation plan calls for revegetation or cultivation of disturbed lands, the following performance standards shall apply to topsoil salvage, maintenance, and redistribution activities:

(a) All salvageable topsoil suitable for revegetation shall be removed as a separate layer from areas to be disturbed by mining operations. Topsoil and vegetation removal shall not precede surface mining activities by more than one year, unless a longer time period is approved by the lead agency.

(b) Topsoil resources shall be mapped prior to stripping and the location of topsoil stockpiles shall be shown on a map in the reclamation plan. If the amount of topsoil needed to cover all surfaces to be revegetated is not available on site, other suitable material capable of sustaining vegetation (such as subsoil) shall be removed as a separate layer for use as a suitable growth media. Topsoil and suitable growth media shall be maintained in separate stockpiles. Test plots may be required to determine the suitability of growth media for revegetation purposes.

(c) Soil salvage operations and phases of reclamation shall be carried out in accordance with a schedule that: (1) is set forth in the approved reclamation plan; (2) minimizes the area disturbed; and (3) is designed to achieve maximum revegetation success allowable under the mining plan.

(d) Topsoil and suitable growth media shall be used to phase reclamation as soon as can be accommodated by the mining schedule presented in the approved reclamation plan following the mining of an area. Topsoil and suitable growth media that cannot be utilized immediately for reclamation shall be stockpiled in an area where it will not be disturbed until needed for reclamation. Topsoil and suitable growth media stockpiles shall be clearly identified to distinguish them from mine waste dumps. Topsoil and suitable growth media stockpiles shall be planted with a vegetative cover or shall be protected by other equally effective measures to prevent water and wind erosion and to discourage weeds. Relocation of topsoil or suitable growth media stockpiles for purposes other than reclamation shall require prior written approval from the lead agency.

(e) Topsoil and suitable growth media shall be redistributed in a manner that results in a stable, uniform thickness consistent with the approved end use, site configuration, and drainage patterns.

Does not apply. The Reclamation Plan does not involve topsoil salvage, maintenance, and redistribution.

§ 3712. Performance Standards for Tailing and Mine Waste Management.

Mine waste disposal is required to be consistent with State Water Resources Control Board mine waste disposal regulations contained in Article 1, Subchapter 1, Chapter 7 of Title 27, California Code of Regulations.

§ 3713. Performance Standards for Closure of Surface Openings.

This mining operation has no drill holes or monitoring wells to be abandoned. If any are developed during the course of mining, they will be closed in accordance with the following requirements:

(a) Except those used solely for blasting or those that will be mined through within one year, all drill holes, water wells, and monitoring wells shall be completed or abandoned in accordance with each of the following:
  (1) Water Code sections 13700, et seq. and 13800, et seq.;
  (2) the applicable local ordinance adopted pursuant to Water Code section 13803;
  (3) the applicable Department of Water Resources report issued pursuant to Water Code section 13800; and
  (4) Subdivisions (1) and (2) of section 2511(g) of Chapter 15 of Title 23 regarding discharge of waste to land.

(b) Prior to closure, all portals, shafts, tunnels, or other surface openings to underground workings shall be gated or otherwise protected from public entry in order to eliminate any threat to public safety and to preserve access for wildlife habitat.

ATTACHMENT A
Slope Stability Analysis for Reclamation Slopes

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

Project No. 07524-32-02
June 3, 2020

Vulcan Materials Company
Properties Office
P.O. Box 130635
Carlsbad, California 92013

Attention: Mr. Mike Linton

Subject: SLOPE STABILITY ANALYSIS FOR RECLAMATION SLOPES
CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

Reference: *Reclamation Plan, Carroll Canyon Mine, CA Mine ID# 91-37-0029, City of San Diego, California*, prepared by BDS Engineering, Inc., plot date April 28, 2020.

Dear Mr. Linton:

In accordance with the request of BDS Engineering, we have performed slope stability analyses for planned slopes shown on the referenced reclamation plans. We understand the City of San Diego LDR-Geology reviewer has requested documentation regarding cut slopes proposed on the property having a "minimum slope stability factor of safety that is suitable for the proposed end use".

Information on the referenced reclamation plans indicate that perimeter slopes will have an inclination of 2:1 (horizontal to vertical) or flatter. Taller slopes will have a bench every 30-foot vertical height. The tallest reclamation slopes are planned in Phase 4 where cut slopes up to approximately 120 feet will be constructed.

We used the computer program Slope/W (2018) distributed by Geo-Slope International to perform the slope stability analysis. The program uses conventional slope stability equations and a two-dimensional limit-equilibrium method to calculate the factor of safety against deep-seated failure. For our analyses, Spencer's Method with a circular failure mechanism was used. Graphical output of our analysis are provided on Figures 1 and 2. For conservatism, we did not include slope benches in our analysis. Also, fill slopes up to 120 feet are not currently shown on the reclamation plan; however, we used the maximum reclamation slope height for both the fill and cut slope analyses. Based on our analyses, project slopes have calculated factors of safety of 1.5 or greater with respect to global stability.

We performed seismic slope stability analysis in accordance with *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California*, prepared by the Southern California Earthquake Center (SCEC), dated June 2002 and *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California (2008)*.

The seismic slope stability analyses were performed using a peak ground acceleration of 0.27g for fill slopes and 0.23g for cut slopes. These accelerations correspond to a 10 percent probability of exceedance in 50 years. A modal magnitude and modal distance of 6.9 and 11.4 kilometers, respectively, were used in the analyses. The peak ground acceleration, modal magnitude, and modal distance were determined from a deaggregation analysis.

Using the parameters discussed above, equivalent site accelerations (k_{EQ}) of 0.154g and 0.133g were calculated for fill and cut slopes, respectively, to perform a screening analysis. The calculated k_{EQ} was imputed as the horizontal seismic coefficient in the stability analyses. The analyses indicate factors of safety of 1.0 or greater for both fill and cut slopes. A slope is considered acceptable by the screening analysis if the calculated factor of safety is greater than 1.0 using k_{EQ}; therefore, the slopes pass the screening analysis for seismic slope stability. Printouts of the seismic slope stability analysis are provided on Figures 3 through 6.

Surficial slope stability analysis are shown on Figures 7 and 8. Our analysis indicates the slopes have a factor of safety of at least 1.5 for surficial stability.

Based on our analyses, cut and fill reclamation slopes have a minimum slope stability factor of safety for both global (static and seismic) and surficial that is suitable for the proposed end use.

If you have any questions, or if we may be of further service, please contact the undersigned at your convenience.

Very truly yours,

GEOCON INCORPORATED

Rodney C. Mikesell
GE 2533

David B. Evans
CEG 1860

RCM:DBE:arm

(e-mail) Addressee
(e-mail) BDS Engineering
Attention: Mr. Tom Jones
(e-mail) KLR Planning
Attention: Ms. Karen Ruggels

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Fill Slope.gsz
Date: 05/28/2020

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf (Compacted Fill)	130	300	32

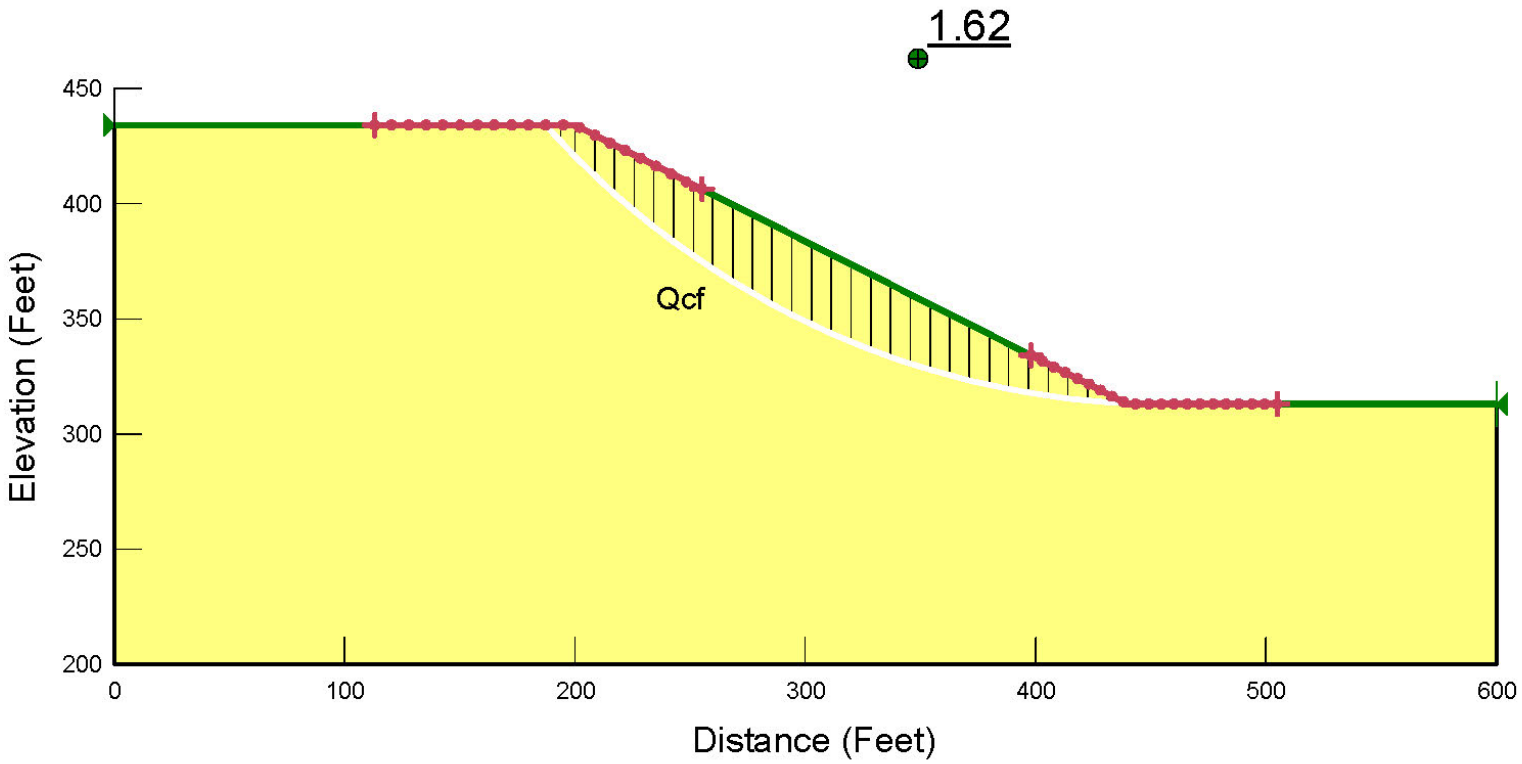


Figure 1

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Cut Slope.gsz
Date: 05/28/2020

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Tst (Stadium Conglomerate)	135	500	40

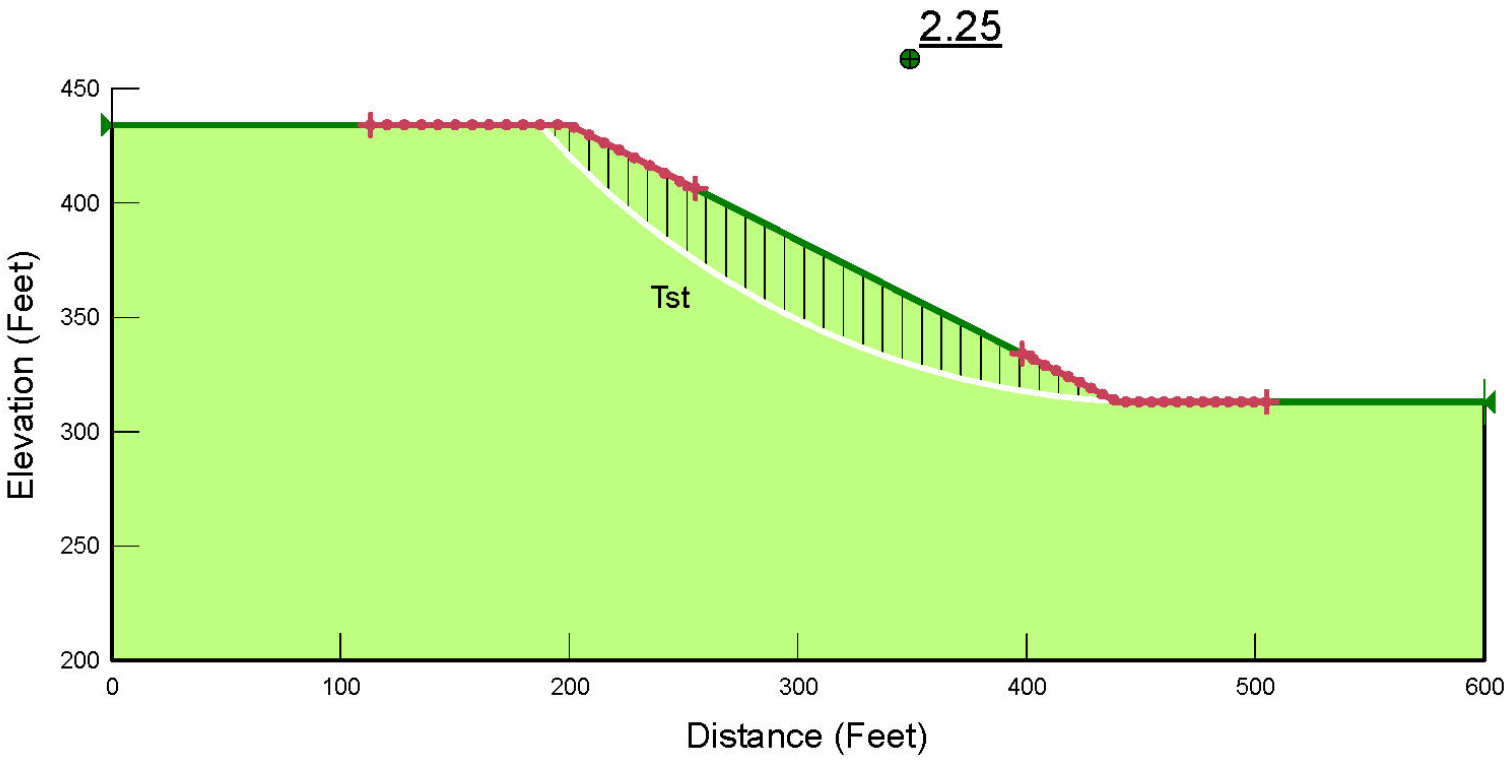


Figure 2

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Fill Slope (Seismic).gsz
Date: 05/28/2020
Horz Seismic Coef.: 0.154

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Qcf (Compacted Fill)	130	300	32

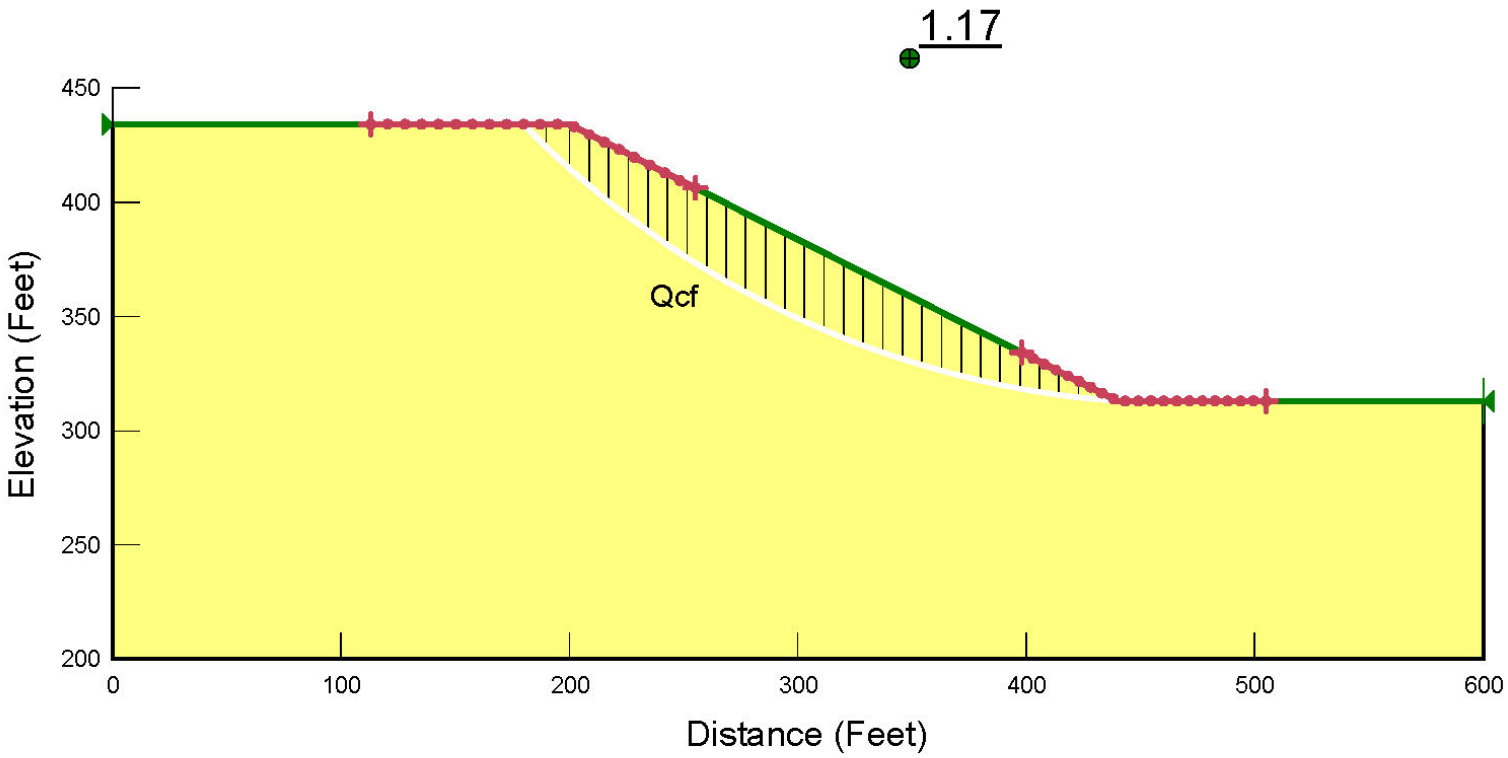


Figure 3

Carroll Canyon Mine
Project No. 07524-32-02
File Name: 2-to-1 Slope Cut Slope (Seismic).gsz
Date: 05/28/2020
Horz Seismic Coef.: 0.133

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Tst (Stadium Conglomerate)	135	500	40

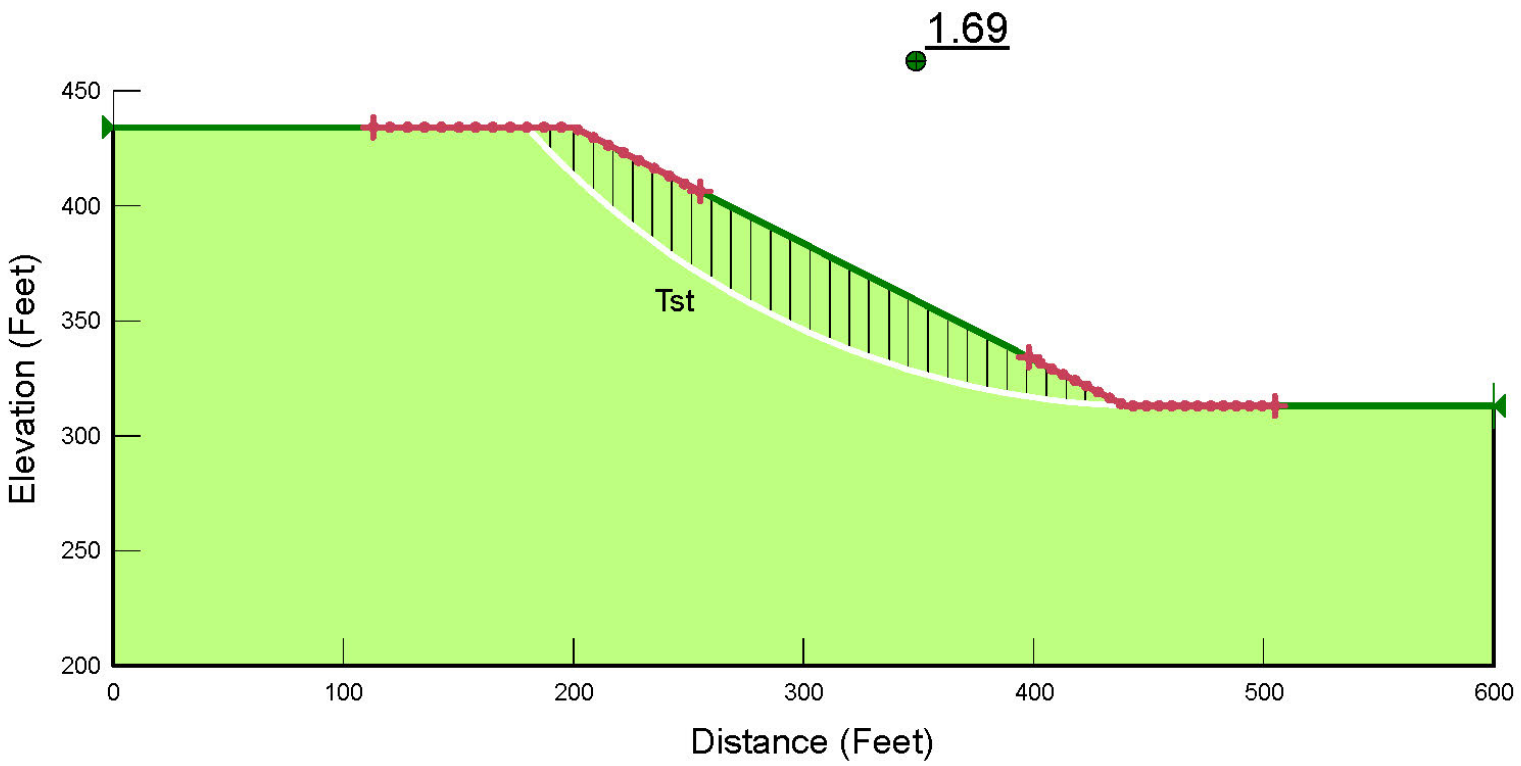


Figure 4

GEOCON

Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project	Carroll Canyon Mine	**Computed By**	RCM
Project Number	07524-32-02		
Date	05/28/20		
Filename	Stonecreek Fill Slopes		

Peak Ground Acceleration (Firm Rock), MHA_r, g	0.27	10% in 50 years
Modal Magnitude, M	6.90	
Modal Distance, r, km	11.4	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft^2 (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5\text{-}95}|_{med}$, sec	13.006	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m, sec	0.616	

Initial Screening with MHEA = MHA = k_{max}g

k_y/MHA	NA
f_{EQ}(u=5cm) = (NRF/3.477)*(1.87-log(u/((MHA$_r$/g)*NRF*$D_{5\text{-}95}$)))	0.5709
k_{EQ} = feq(MHA$_r$)/g	0.154
Factor of Safety in Slope Analysis Using k_{EQ}	1.17

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, T_s = 4H/V_s, sec	NA
T_s/T_m	NA
MHEA/(MHA*NRF)	NA
NRF = 0.6225+0.9196EXP(-2.25*MHA$_r$/g)	1.12
MHEA/g	NA
k_y/MHEA = k_y/k_{max}	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) NA

FIGURE 5

GEOCON

Seismic Slope Stability Evaluation

Input Data in Shaded Areas

Project Carroll Canyon Mine **Computed By** RCM
Project Number 07524-32-02
Date 05/28/20
Filename Cut Slopes

Peak Ground Acceleration (Firm Rock), MHA_r, g	0.23	10% in 50 years
Modal Magnitude, M	6.90	
Modal Distance, r, km	11.40	
Site Condition, S (0 for rock, 1 for soil)	1	
Yield Acceleration, k_y/g	NA	<-- Enter Value or NA for Screening Analysis
Shear Wave Velocity, V_s (ft/sec)	NA	<--
Max Vertical Distance, H (Feet)	NA	<--
Is Slide X-Area > 25,000ft^2 (Y/N)	N	<-- Use "N" for Buttress Fills
Correction for horizontal incoherence	1.0	
Duration, $D_{5-95}\|_{med}$, sec	13.006	
Coefficient, C_1	0.5190	
Coefficient, C_2	0.0837	
Coefficient, C_3	0.0019	
Standard Error, ε_T	0.437	
Mean Square Period, T_m, sec	0.616	

Initial Screening with MHEA = MHA = k_{max}g

k_y/MHA	NA
$f_{EQ}(u=5cm) = (NRF/3.477)*(1.87-\log(u/((MHA_r/g)*NRF*D_{5-95})))$	0.5775
$k_{EQ} = feq(MHA_r)/g$	0.133
Factor of Safety in Slope Analysis Using k_{EQ}	1.69

Passes Initial Screening Analysis

Approximation of Seismic Demand

Period of Sliding Mass, $T_s = 4H/V_s$, sec	NA
T_s/T_m	NA
MHEA/(MHA*NRF)	NA
$NRF = 0.6225+0.9196EXP\{-2.25*MHA_r/g\}$	1.17
MHEA/g	NA
$k_y/MHEA = k_y/k_{max}$	NA
Normalized Displacement, Normu	NA

Estimated Displacement, u (cm) **NA**

FIGURE 6

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	=	Infinite
DEPTH OF SATURATION	Z	=	5 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)	
SLOPE ANGLE	i	=	26.6 degrees
UNIT WEIGHT OF WATER	γ_w	=	62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	=	130 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	=	32 degrees
APPARENT COHESION	C	=	300 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ cos^2\ i\ tan\ \phi}{\gamma_t\ Z\ sin\ i\ cos\ i} = 1.8$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - FILL SLOPES

GEOCON INCORPORATED

GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS

6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974

PHONE 858 558-6900 - FAX 858 558-6159

CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 04 - 07 - 2020	PROJECT NO. 07524 - 32 - 02	FIG. 7

Plotted:05/28/2020 10:43AM | By:ALVIN LADRILLONO | File Location: Y:\I_GEOTECH\07000\07500\07524-32-02\2020-04-07\DETAILS\Slope Stability Analyses-Surficial (SSAS-F).dwg

ASSUMED CONDITIONS :

SLOPE HEIGHT	H	=	Infinite
DEPTH OF SATURATION	Z	=	3 feet
SLOPE INCLINATION	2 : 1	(Horizontal : Vertical)	
SLOPE ANGLE	i	=	26.6 degrees
UNIT WEIGHT OF WATER	γ_w	=	62.4 pounds per cubic foot
TOTAL UNIT WEIGHT OF SOIL	γ_t	=	135 pounds per cubic foot
ANGLE OF INTERNAL FRICTION	ϕ	=	40 degrees
APPARENT COHESION	C	=	500 pounds per square foot

SLOPE SATURATED TO VERTICAL DEPTH Z BELOW SLOPE FACE

SEEPAGE FORCES PARALLEL TO SLOPE FACE

ANALYSIS :

$$FS = \frac{C + (\gamma_t - \gamma_w)\ Z\ \cos^2 i\ \tan\phi}{\gamma_t\ Z\ \sin i\ \cos i} = 4.0$$

REFERENCES :

1.....Haefeli, R. *The Stability of Slopes Acted Upon by Parallel Seepage*, Proc. Second International Conference, SMFE, Rotterdam, 1948, 1, 57-62

2.....Skempton, A. W., and F.A. Delory, *Stability of Natural Slopes in London Clay*, Proc. Fourth International Conference, SMFE, London, 1957, 2, 378-81

SURFICIAL SLOPE STABILITY ANALYSIS - CUT SLOPES

GEOCON
INCORPORATED
GEOTECHNICAL ■ ENVIRONMENTAL ■ MATERIALS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

CARROLL CANYON MINE
SAN DIEGO, CALIFORNIA

RM / AML		DSK/GTYPD	DATE 04 - 07 - 2020	PROJECT NO. 07524 - 32 - 02	FIG. 8

Plotted:05/28/2020 10:42AM | By:ALVIN LADRILLONO | File Location:Y:\1_GEOTECH\07000\07500\07524-32-02\2020-04-07\DETAILS\Slope Stability Analyses-Surficial (SS AS-C).dwg