# Draft
# Environmental Impact Report

**SCH# 2021110076**

## Volume 3

**Appendices E through L**

## GEM HILL QUARRY PROJECT

**by CalPortland Company *(PP21404)***

Conditional Use Permit No. 45, Map No. 214

Kern County
Planning and Natural Resources Department Bakersfield, California

August 2022

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Appendix E

# Cultural Resources Technical Studies

Appendix E.1

# Phase I Historical/Archaeological Resources Survey, Rosamond Hills Mine Project, Assessor's Parcel Nos. 345-294-17, 0345-031-02, and 0345-032-02, -05, and -31 (redacted version)

**PHASE I HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY**

# ROSAMOND HILLS MINE PROJECT

**Rosamond Area, Kern County, California**

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March 6, 2019
CRM TECH Contract No. 3418

**Title:** Phase I Historical/Archaeological Resources Survey: Rosamond Hills Mine Project, Assessor's Parcel Nos. [redacted], Rosamond Area, Kern County, California

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**USGS Quadrangle:** Soledad Mountain, Calif., 7.5' quadrangle ([redacted], San Bernardino Baseline and Meridian)

**Project Size:** Approximately 190 acres

**Keywords:** Antelope Valley, western Mojave Desert; [redacted]

## EXECUTIVE SUMMARY

Between December 2018 and February 2019, at the request of Lilburn Corporation, CRM TECH performed a cultural resources study on approximately 190 acres of vacant land in the unincorporated Rosamond area of Kern County, California. The subject property of the study consists of Assessor's Parcel No. [redacted], San Bernardino Baseline and Meridian.

The study is a part of the environmental review process for the proposed Rosamond Hills Mine project, which entails the development of a mine and reclamation plan for the establishment of a pozzolan quarry, a processing plant, and various roads, including a main access road leading to Mojave Tropico Road. The estimated total area of disturbance will be approximately 80 acres within the overall project boundary. The County of Kern, as the lead agency for the project, required the study pursuant to the California Environmental Quality Act (CEQA). The purpose of the study is to provide the County with the necessary information and analysis to determine whether the proposed project would potentially cause a substantial adverse change to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH initiated a historical/archaeological resources records search, pursued historical background research, contacted Native American representatives, and carried out an intensive-level field survey of the entire project area. The records search results indicate that [redacted], was previously recorded as lying partially within the current project area. During the field survey, additional artifacts and features were observed both within and outside the previously established site boundary, including a [redacted]. As a result, the site boundary was expanded significantly to include the locations of the new discoveries and now encompasses almost the entire project area.

[redacted]. Therefore, CRM TECH recommends to the County of Kern that a Phase II archaeological testing and evaluation program be completed at the portion of [redacted] within the project area to determine the presence or absence of any substantial subsurface cultural remains.

The testing and evaluation program should consist of, at a minimum, detailed recordation and mapping of the flaking stations, surface collection of unique artifacts such as the projectile point, and subsurface excavations at the rock shelters and at a selection of dense scatters of tested stones. The Phase II study should also include laboratory analysis of recovered archaeological materials, preparation of a final report to document the findings, and permanent curation of the artifact assemblage at an appropriate facility. Further recommendations regarding the treatment of Site [redacted] will be formulated and presented on the basis of the results of the testing and evaluation program.

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## INTRODUCTION

Between December 2018 and February 2019, at the request of Lilburn Corporation, CRM TECH performed a cultural resources study on approximately 190 acres of vacant land in the unincorporated Rosamond area of Kern County, California (Fig. 1). The subject property of the study consists of Assessor's Parcel No. ([redacted], San Bernardino Baseline and Meridian (Figs. 2, 3).

The study is a part of the environmental review process for the proposed Rosamond Hills Mine project, which entails the development of a mine and reclamation plan for the establishment of a pozzolan quarry, a processing plant, and various roads, including a main access road leading to Mojave Tropico Road. The estimated total area of disturbance will be approximately 80 acres within the overall project boundary. The County of Kern, as the lead agency for the project, required the study pursuant to the California Environmental Quality Act (CEQA; PRC §21000, et seq.). The purpose of the study is to provide the County with the necessary information and analysis to determine whether the proposed project would potentially cause a substantial adverse change to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH initiated a historical/archaeological resources records search, pursued historical background research, contacted Native American representatives, and carried out an intensive-level field survey of the entire project area. The following report is a complete account of the methods, results, and final conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

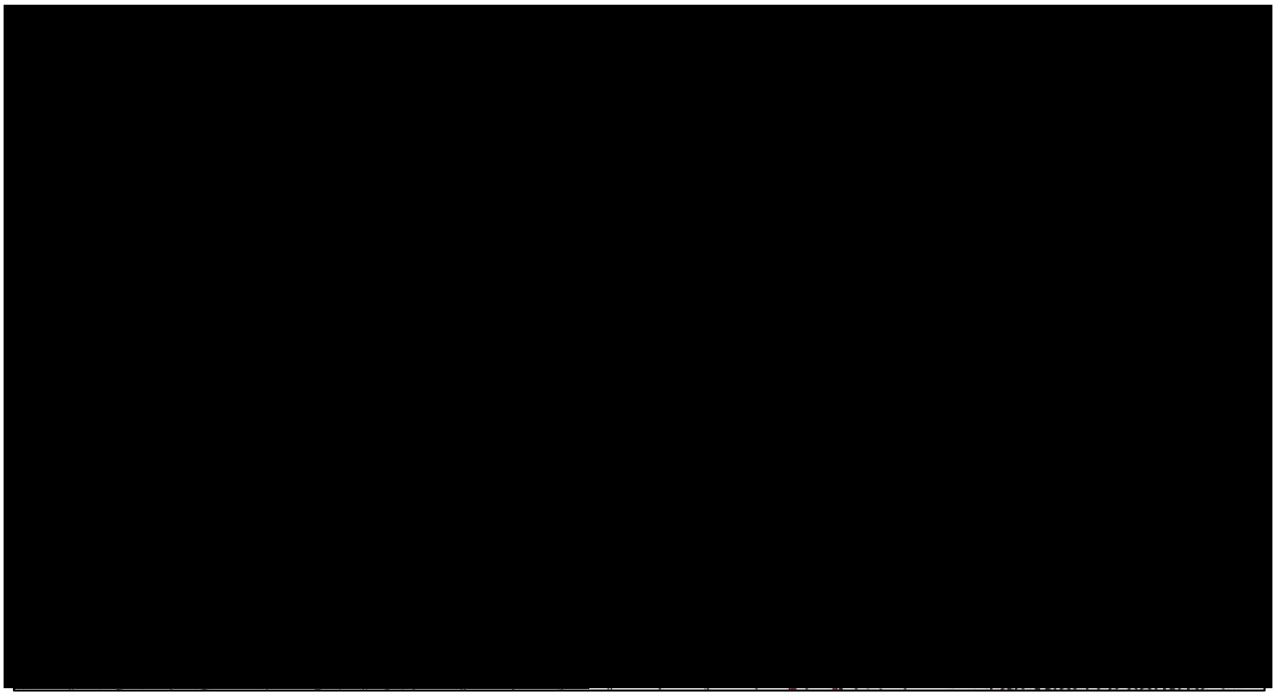


Figure 1. Project vicinity. (Based on USGS Bakersfield and Los Angeles, Calif., quadrangles [USGS 1971; 1975])

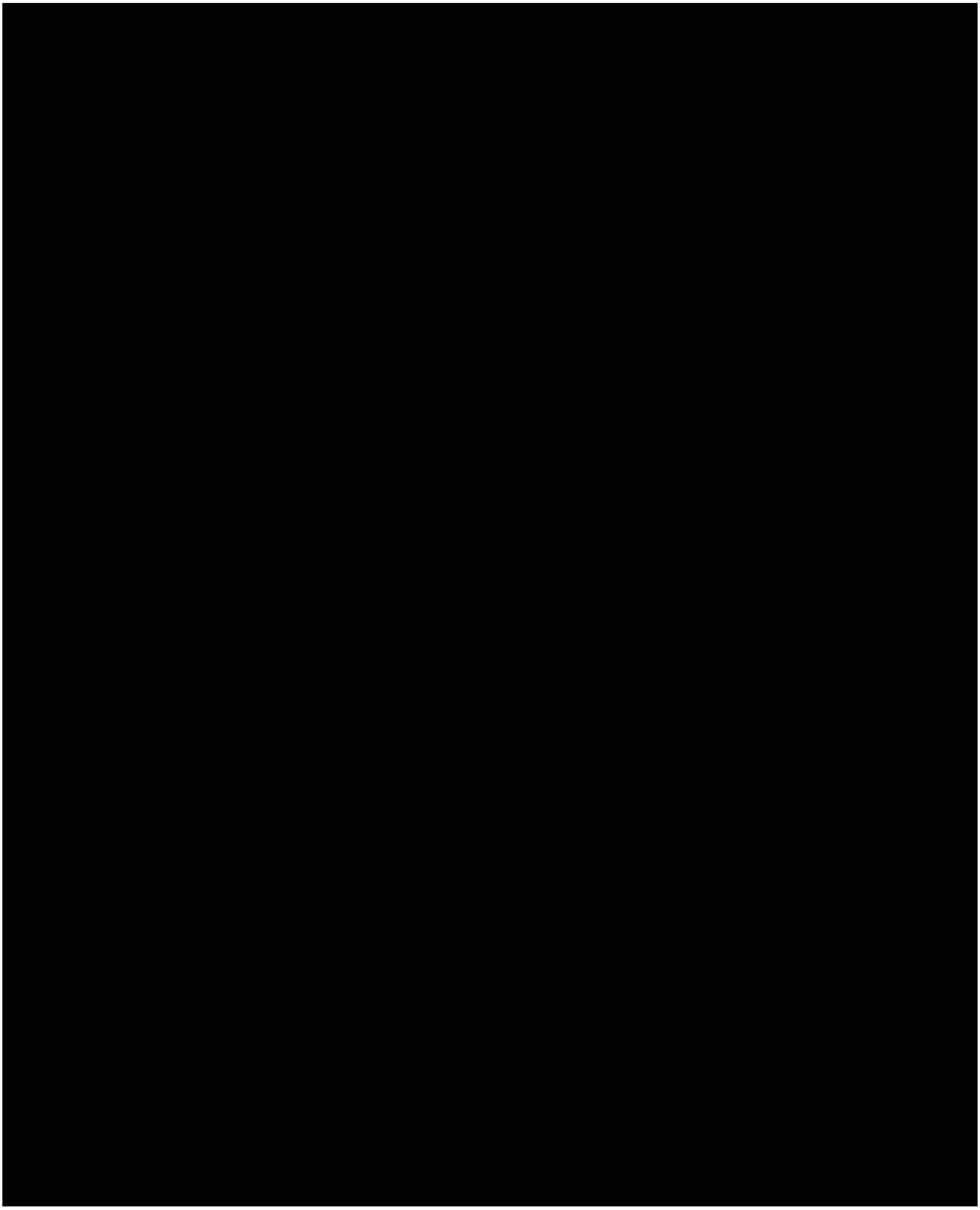


Figure 2. Project area. (Based on USGS Soledad Mountain, Calif., 7.5' quadrangle [USGS 1973])

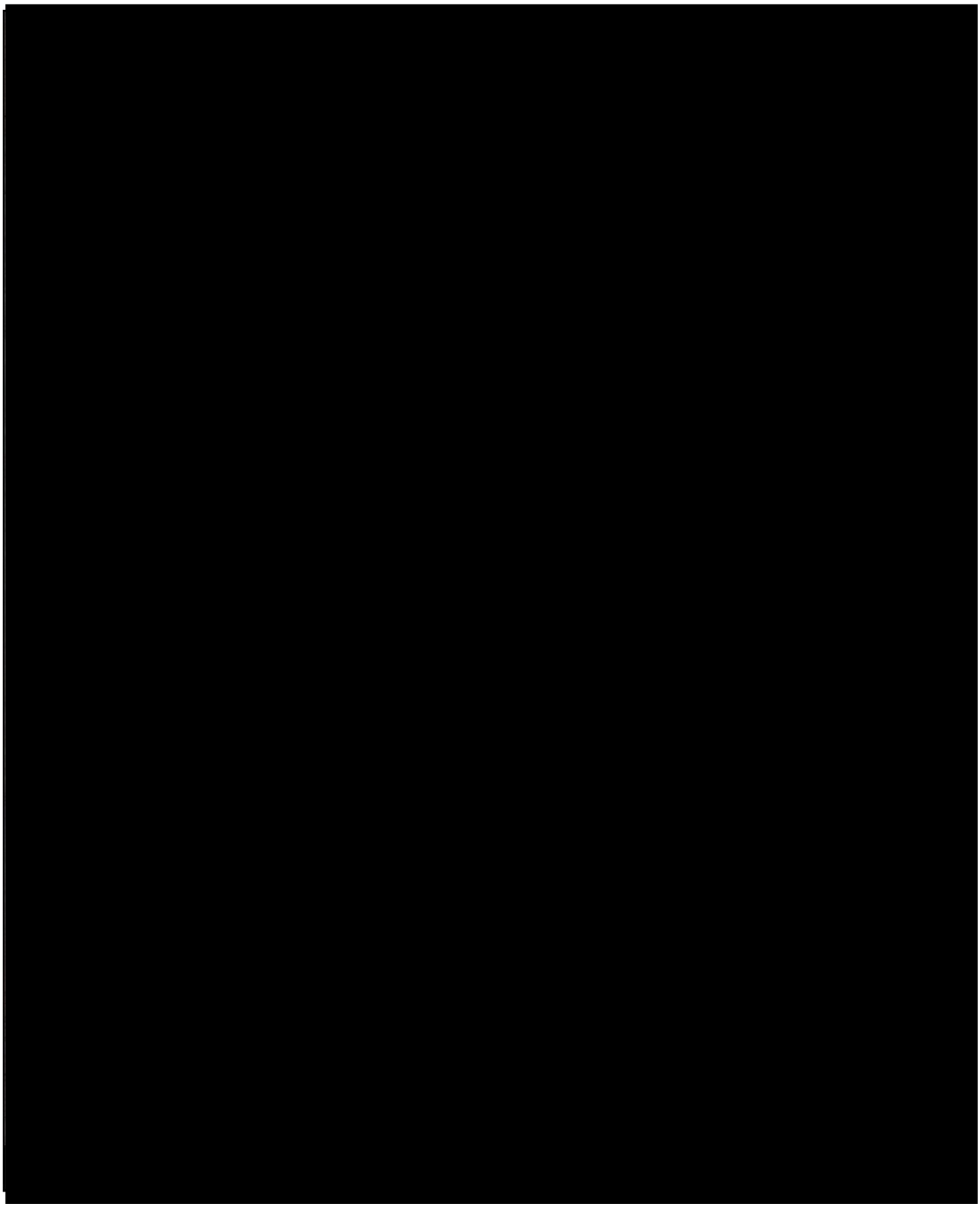


Figure 3. Aerial view of the project area.

## SETTING

### CURRENT NATURAL SETTING

The project area is situated in the Rosamond Hills in the northern Antelope Valley, and to the northwest of the unincorporated community of Rosamond. Lying on the western rim of the Mojave Desert, the Antelope Valley is typical in climate and environment of southern California's desert country, marked by extremes in temperature and aridity. The mean minimum temperature in winter is 28°F and the mean maximum temperature in summer reaches 96°F, with temperatures over 100°F not uncommon. The average annual precipitation is around 8-12 inches, most of which occurs between November and March.

Surrounded by open desert land, the project area extends across steep hills, precipices, and both deep and shallow erosional cuts, but is generally level with occasional low mounds that rise towards the north (Figs. 3, 4). Elevations range from approximately 2,620 feet above mean sea level near the southern end to nearly 3,000 feet above mean sea level at some places along the northern project boundary. Surface soils generally consist of decomposing granite, ranging from gravels to fine sands, and much of the surface area contains small to medium colluvial rocks with well-developed desert varnish (Fig. 4).

The property is located in the Western Mojave Mountains and Valleys Zone (Menke et al. 2013). Munz and Keck (1959) classified the vegetation community of this part of the Mojave Desert as Coastal Sage Scrub while the California Native Plant Society, using a newer classification system, considers the area a part of the *Atriplex lentiformis* (Quailbush scrub) Alliance (CNPS 2019). Other plants from this vegetative community observed within project boundaries include saltbush, creosote, ephedra, and desert grasses, as well as a single Joshua tree.



Figure 4. Overview of the project area. (Photograph taken on January 3, 2019; view to the northwest)

## CULTURAL SETTING

### Archaeological Context

In order to understand Native American cultures prior to European contact, archaeologists have devised chronological frameworks on the basis of artifacts and site types dating back some 12,000 years. One of the more frequently used time frames for the Mojave Desert divides the region's prehistory into five periods marked by changes in archaeological remains, reflecting different ways in which Native peoples adapted to their surroundings. According to Warren (1984) and Warren and Crabtree (1986), these five periods are the Lake Mojave Period (12,000-7,000 years ago), the Pinto Period (7,000-4,000 years ago), the Gypsum Period (4,000-1,500 years ago), the Saratoga Springs Period (1,500-800 years ago), and the Protohistoric Period (800 years ago to European contact).

This time frame is based on general technological changes from large stone projectile points, with few milling stones for grinding food products, to smaller projectile points with an increase in milling stones. The scheme also notes increases in population, changes in food procurement and resource exploitation, and more cultural complexity over time. During the Protohistoric Period, there is evidence of contact with the Colorado River tribes and the introduction of pottery across the Mojave Desert.

### Ethnohistorical Context

The present-day Rosamond area lies on the southern edge of the traditional homeland of the Kitanemuk, a small Native American group located principally on the southern and western flanks of the Tehachapi Mountains (Blackburn and Bean 1978). Although their general ecological adaptation and subsistence technology differed little from that of their neighbors to the north or west, the Kitanemuk would descend to the Antelope Valley floor to take advantage of seasonal desert resources and engage in trade. Prior to European contact, the Antelope Valley was a nexus of goods exchange between the Kitanemuk and other nearby tribal groups, including Vanyumé, Serrano, Tataviam, and interior Chumash (Sutton 1980; Sutton et al. 2009; Scharlotta 2014).

Desert resources utilized by the Kitanemuk for food, medicine, and utilitarian purposes would have included Joshua tree for cordage, dye, and edible blossoms; creosote, ephedra, and salt bush for medicine and firewood; and various cacti for food. In wetter paleo-environment of the late Pleistocene and early Holocene, the region was the site of Lake Thompson (Hilu et al. 1982; Orme 2004; Sutton et al. 2009). The receding of the lake has left behind three dry lakes in the region, including Lake Rosamond, that still flood during storm events (Orme 2004). The area would have hosted desert grasses, the seeds of which were collected with seed beaters, and stands of mesquite (Hilu et al. 1982). As the name implies, pronghorns were plentiful in the valley during prehistoric times (Hammond 2017).

Linguistic evidence through the use of similar familial terms suggests the presence of some form of the patrilineal system found elsewhere in southern California, but the lineages were not totemic, nor was there evidence of moieties. Precise data on the demographic characteristics and political organization of the Kitanemuk can no longer be obtained. However, archaeological evidence points to a somewhat stratified society. It is known ethnographically that each village had a chief,

ceremonial manager, messengers, and shamans (Blackburn and Bean 1978:567). The Kitanemuk utilized formal cemeteries, and excavations have revealed the presence of grave goods implying status among tribal members (Sutton 1980:218). These grave goods include trade items from the Santa Barbara coast, San Joaquin Valley, and eastern Mojave Desert (*ibid*.).

The Kitanemuk may have had contacts with the Spanish colonizers as early as the 1770s, and disease and epidemic that may have preceded them along heavily utilized trade routes had an enormous impact on this small group (Sutton et al. 2009). During the Spanish and Mexican Periods, the Kitanemuk were apparently represented at the San Fernando, San Gabriel, and San Buenaventura Missions. After the American annexation of Alta California, some Kitanemuk were found on the Tejon Reservation in the 1850s, and later on at the Tule River Reservation, where some of their descendants still reside.

**Historical Context**

In 1772, a small force of Spanish soldiers under the command of Pedro Fages became the first Europeans to set foot in the Antelope Valley. Over the next century, a number of famous explorers, including Francisco Garcés, Jedediah Smith, Kit Carson, and John C. Fremont, traversed the Antelope Valley, but their explorations brought little change to the region. For much of the 19th century, the Antelope Valley continued to receive only the occasional hunters, drawn by its legendary herds of pronghorns, and travelers. Don Alexander and Phineas Banning's first stage line between Los Angeles and northern California, for example, ran through the southern edge of the valley.

In 1876, when the Southern Pacific Railroad Company (SP) chose the essentially uninhabited Antelope Valley for its line between the San Joaquin Valley and the Los Angeles Basin, it established a string of regularly spaced sidings and water stops across the desert. The arrival of the railroad ended the isolation of the region and sowed the seeds for a string of new towns that would spring up around the SP stations as settlers arrived to work on the railroad or earn a living providing services for the railroad workers. Among these railroad towns was Rosamond, a siding and a water stop established in 1877 by the SP and named for the daughter of a railroad official (Larson n.d.; WAVHS n.d.).

Rosamond soon prospered, thanks in part to the abundance of artesian water in the vicinity. The first Rosamond post office opened in 1885, and the first local industries were mining and cattle ranching (WAVHS n.d.). In the 1896, a mini mining boom spread in the area after gold was discovered by Ezra Hamilton, who had bought land northwest of Rosamond, about two miles south of the project area, to harvest clay for his Los Angeles pottery company (Larson n.d.). The Lida Mine, as Hamilton named it, was sold to brothers Clifford and Cecil Burton in 1908 and renamed the Tropico Gold Mine (*ibid.*). It eventually ceased operation in 1958 after closing and reopening a few times over the years (*ibid.*).

Meanwhile, other early economic endeavors soured in the mid-1890s as several years of continuous drought all but destroyed Rosamond and other settlements in the Antelope Valley and forced nearly all settlers to abandon their land and leave the region (Hamilton et al. 1913:35-37). After the turn of the century, however, the Antelope Valley slowly recovered. With the adoption of electric water

pumps, irrigated agriculture became the primary means of livelihood in the region. Alfalfa, which was first introduced around 1890 (*ibid.*:34), emerged as the principal crop, so much so that "alfalfa is king" became the slogan for the agricultural interests in the valley.

After WWII, the aerospace and defense industry overtook agriculture as the most important sector in the Antelope Valley economy. In 1968, the Antelope Valley Freeway (State Route 14) was extended to Rosamond (WAVHS n.d.). As a direct result, Rosamond has experienced accelerated growth in residential development since then and, like the other communities in the Antelope Valleys, has increasingly taken on the characteristics of a "bedroom community" in support of the Greater Los Angeles area.

## RESEARCH METHODS

### RECORDS SEARCH

On December 14, 2018, Celeste Thomson, coordinator of the Southern San Joaquin Valley Information Center (SSJVIC), completed the records search for this study. Located on the campus of California State University, Bakersfield, the SSJVIC is the State of California's official cultural resource records repository for Kern County. During the records search, Thomson examined maps and records on file at the SSJVIC for previously identified cultural resources in or near the project area and existing cultural resources reports pertaining to the project vicinity. Previously identified cultural resources include properties designated as California Historical Landmarks or Points of Historical Interest as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

### HISTORICAL BACKGROUND RESEARCH

Historical background research for this study was conducted by CRM TECH principal investigator/ historian Bai "Tom" Tang. In addition to published literature in local and regional history, sources consulted during the research included U.S. General Land Office (GLO) land survey plat maps dated 1856, U.S. Geological Survey (USGS) topographic maps dated 1917-1973, and aerial photographs taken in 1972-2017. The historic maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley. The aerial photographs are available at the Nationwide Environmental Title Research (NETR) Online website and from the Google Earth software.

### NATIVE AMERICAN PARTICIPATION

On December 4, 2018, CRM TECH submitted a written request to the State of California Native American Heritage Commission (NAHC) for a records search in the commission's Sacred Lands File. Following the NAHC's recommendations and previously established consultation protocol, on December 17, 2018, CRM TECH further contacted a total of ten tribal representatives in the region in writing for additional information on potential Native American cultural resources in or near the project area. The correspondence between CRM TECH and the Native American representatives is attached to this report as Appendix 2.

## FIELD SURVEY

On January 2 and 3, 2019, CRM TECH principal investigator Michael Hogan and project archaeologists John D. Goodman II, Michael Richards, Cynthia Morales, and Damien Tietjen carried out the intensive-level, pedestrian field survey of the project area. Due to the variable terrain, the survey was completed using a variety of survey methods. These included walking along parallel transects spaced 15-20 meters (approximately 50-feet) apart and oriented east-west, north-south, or southeast-northwest; walking similar transects along contours on some hillsides; and meandering along narrow finger fans between drainages. Steeper slopes with no rock flows were assessed as having little potential to contain significant cultural resources and were not surveyed. The field GPS unit, previously programmed with project boundaries, was continually checked to ensure that the entire project area was inspected.

Using these methods, the ground surface in the project area was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years or older). Larger boulders were inspected for potential marks of grinding, pounding, quarrying, or other human use. Fragmented rocks were inspected to see if they had been broken by nature or by humans. Indentations in cliff walls were inspected for remnants of past use as shelters. Cut banks and animal burrows were inspected for any indication of buried cultural deposits. Changes in vegetation were evaluated to determine if they might reflect human interference in prehistoric or historic times. Through these efforts, the various landforms in the entire project area were sufficiently studied to determine whether any cultural resources were present.

# RESULTS AND FINDINGS

## RECORDS SEARCH

According to SSJVIC records, one previous study completed in 1980 included the easternmost portion of the current project area, namely the proposed route of the main access road to Mojave Tropico Road (Schiffman and Lewis 1980; KE-01481 in Fig. 5), but the rest of the project area had not been surveyed systematically for cultural resources prior to this study. The 1980 survey, covering mainly the adjacent land to the east and the south of the main project site, recorded one large prehistoric—i.e., Native American—archaeological site, [redacted] that extended into the current project boundaries (*ibid.*:1). Described as primarily a [redacted] (Lewis 1980; see App. 3).

Outside the project area but within a one-mile radius, SSJVIC records show at least five other previous studies completed on various tracts of land between 1980 and 1992, which collectively covered roughly 20% percent of the land within the scope of the records search (Fig. 5). As a result of these and other similar studies, six additional archaeological sites and one isolate—i.e., a locality with fewer than three artifacts—were recorded within the scope of the records search, as listed in Table 1.

All of these known cultural resources were prehistoric in origin. [redacted], also described as a [redacted], was the nearest to the project area at the distance of roughly 0.4 mile to the south. The

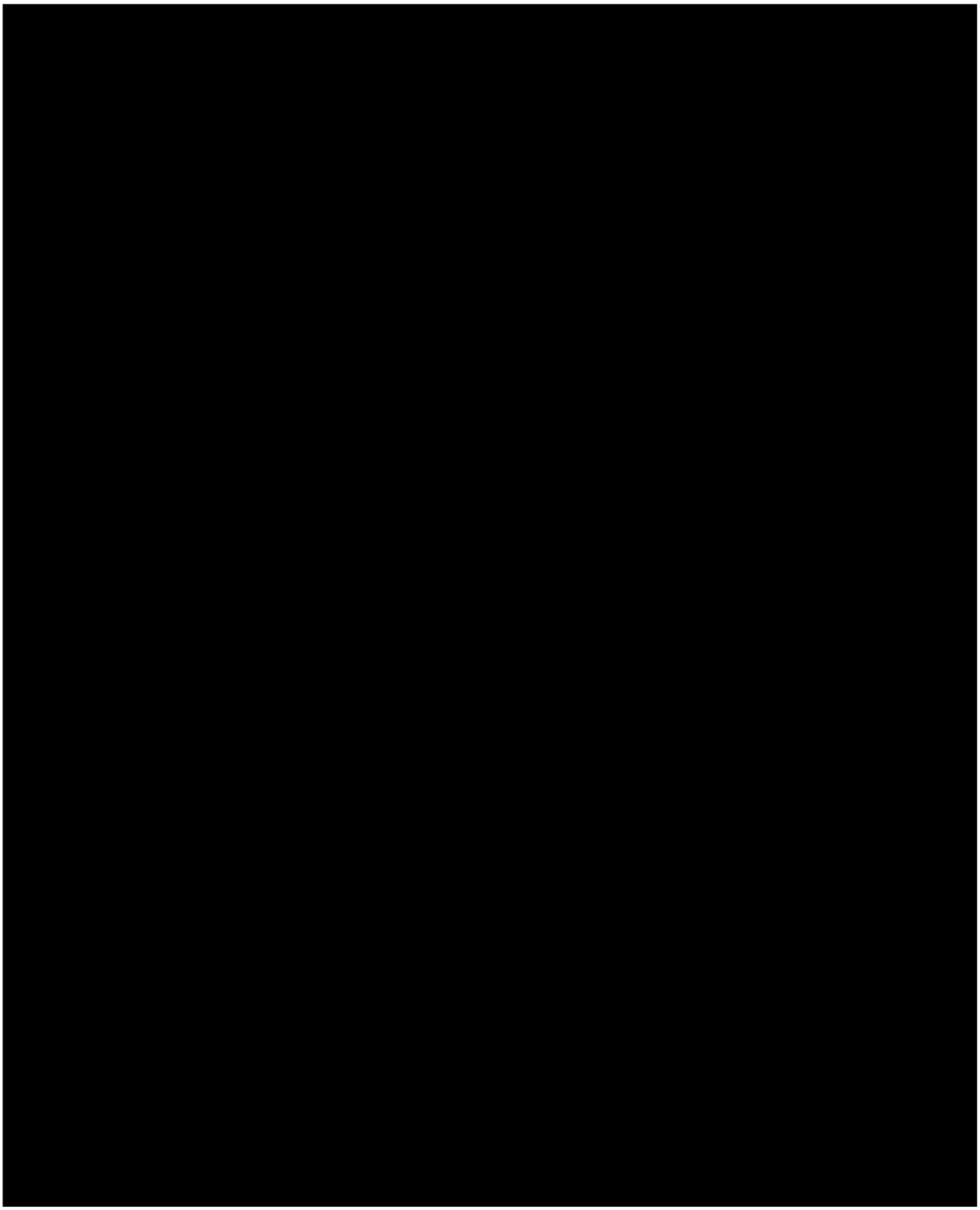


Figure 5. Previous cultural resources studies in the vicinity of the project area, listed by SSJVIC file number. Locations of archaeological resources are not shown as a protective measure.

| Table 1. Previously Recorded Cultural Resources in the Scope of the Records Search | | |
|---|---|---|
| **Primary No.** | **Trinomial** | **Description** |
| [redacted] | [redacted] | [redacted] |

*Located partially within current project boundaries

other five sites represented an additional [redacted] none of these resources was located in the immediate vicinity of the project area, and thus none of them requires further consideration during this study.

## HISTORICAL BACKGROUND RESEARCH

Historical sources consulted for this study suggest that the project area is relatively low in sensitivity for cultural resources from the historic period. As Figures 6-9 illustrate, no evidence of any settlement or land development activities was observed within the project area throughout the 1850s-1940s era. The forerunner of present-day Mojave Tropico Road, first noted in the 1910s, and a winding dirt road, noted in the 1940s, were the only man-made features known to be present in or near the project area during the historic period (Figs. 6-9, NETR Online 1972). Since the early

[redacted]

Figure 6. The project area and vicinity in 1855-1856. (Source: GLO 1856a-d)

Figure 7. The project area and vicinity in 1915. (Source: USGS 1917)



Figure 8. The project area and vicinity in 1943. (Source: USGS 1943)

Figure 9. The project area and vicinity in 1946-1947. (Source: USGS 1947)

post-WWII era, some scattered rural residences have appeared in the surrounding area, but the project area itself, located on rugged hilly land, has remained vacant and undeveloped to the present time (NETR Online 1972-2014; Google Earth 1994-2017).

## NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the Native American Heritage Commission reports in a letter dated December 12, 2018, that the Sacred Lands File identified no Native American cultural resources within the project area. The NAHC recommended contacting local Native American groups for further information and provided a list of potential contacts in the region (see App. 2). Upon receiving the NAHC's reply, CRM TECH sent written requests for comments to all 10 tribal group on the referral list (see App. 2). In some cases, a tribe's designated spokesperson for cultural resources was contacted in lieu of the individual(s) on the referral list, as recommended in the past by the tribal government staff. The ten tribal representatives contacted during this study are listed below:

- Danelle Gutierrez, Tribal Historic Preservation Officer, Big Pine Paiute Tribe of the Owens Valley;
- Julio Quair, Chairperson, Chumash Council of Bakersfield;
- Robert Robinson, Chairperson, Kern Valley Indian Council;
- Delia Dominguez, Chairperson, Kitanemuk and Yowlumne Tejon Indians;
- Lee Clauss, Director of Cultural Resources Management, San Manuel Band of Mission Indians;
- Rueben Barrios, Chairperson, Santa Rosa Rancheria (Tachi-Yokut Tribe);

- Octavio Escobedo, Chairperson, Tejon Indian Tribe;
- Robert L. Gomez, Chairperson, Tubatulabals of Kern Valley;
- Neil Peyron, Chairperson, Tule River Indian Tribe;
- Kenneth Woodrow, Chairperson, Wuksache Indian Tribe/Eshom Valley Band.

As of this time, only Jessica Mauck, Cultural Resources Analyst for the San Manuel Band of Mission Indians, has responded to the inquiry. In an e-mail dated December 21, 2018, Ms. Mauck states that the project area is located outside the tribe's ancestral territory and that the tribe has no information to provide for this study. However, Ms. Mauck points out in the e-mail that the Willow Springs area, [redacted], is of high cultural sensitivity to the San Manuel Band. Ms. Mauck speculates that the project vicinity may have served as a lithic source to the prehistoric settlement at Willow Springs and another one on the Edwards Air Force Base, approximately 15 miles to the east (see App. 2).

**FIELD SURVEY**

As discussed above, [redacted], was previously recorded as lying partially within the eastern portion of the project area and extending further east and south beyond project boundaries. As recorded in 1980, [redacted] measured more than a half-mile long and a quarter-mile wide, oriented north-south along the eastern boundary of the project area, and consisted of [redacted] (Lewis 1980; see App. 3).

During the field survey, numerous lithic artifacts were observed on the ground surface throughout the project area, both within and outside the previously established boundary of [redacted]. Among them were a complete [redacted] (Fig. 10). Some larger rocks still embedded in the ground had flakes removed. At least six discrete flaking stations were identified, some of which are possibly among those recorded in 1980s.

In addition, three potential [redacted] were found in the northwestern portion of the project area (Fig. 10), and [redacted] were found in both the northern and the southern portions. At least three historic-period refuse scatters were also noted in the southern half of the site (Fig. 10). All of the artifacts and features encountered within the project area were determined to be parts of [redacted]. As a result, the site boundary was expanded significantly to the west to include the locations of the new discoveries and now encompasses almost the entire project area (see App. 3).

The majority of the rocks that had been tested were rhyolite, with some jasper, quartz, chalcedony, and quartzite also present. All of the sub-angular rocks observed on the surface have been subjected to considerable tumbling and have a dark-colored cortical rind caused by weathering. To determine the quality of the material and its workability, cortical flakes would have to be removed, likely accounting for the large number of flaked rocks. Despite the quantity of rocks that were tested prehistorically, there is a general paucity of secondary and tertiary flakes. This suggests that the focus at the site was not on the production of tools. Based on ethnographic and archaeological sources, it is probable that many of the rocks were ultimately used for trade with surrounding tribal groups.



Figure 10. Artifacts and features observed at Site 15-001203. *Clockwise from top left*: flaking station; metate; historic-period refuse scatter; rock shelter.

Utilizing laser ablation-time of flight-inductively coupled plasma-mass spectrometry, Scharlotta (2014) determined that rhyolite artifacts from three archaeological sites in the Antelope Valley were sourced to the Rosamond Hills area, despite the presence of a rhyolite source in closer proximity at Fairmount Butte. The tribal affiliation at these sites is presumed to be Tataviam and possibly Vanyumé or Serrano (*ibid.*). Scharlotta hypothesizes that the Kitanemuk were uniquely positioned to obtain coastal trade goods from interior Chumash groups in the Tehachapi Mountains and bring these, along with obsidian, to the Antelope Valley. They would then source rhyolite from the Rosamond Hills to trade, providing a variety of exchange goods for those willing to travel farther than Fairmount Butte (*ibid.*). Sutton et al. (2009) also discusses the importance of the Antelope Valley as a nexus of trade.

In addition to testing rocks for possible trade, the discrete chipping stations and groundstone artifacts demonstrate that opportunistic hunting and food processing also took place at the site. The grinding tools were likely used to process grass for seeds to make atole or flour and possibly to prepare creosote or other medicinal plants for teas, poultices, and salves (Anderson 2005). Depending upon the seasonal migrations of pronghorn herds, projectile points would have been worked for hunting. Cutting tools could have been used to harvest and process Joshua tree leaves for cordage and roots for basketry dye during these resource procurement excursions.

## DISCUSSION

The purpose of this study is to identify any cultural resources in the project area and to assist the County of Kern in determining whether or not such resources meet the official definition of "historical resources," as provided in the California Public Resources Code, in particular CEQA. According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria for the evaluation of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

As stated above, [redacted], originally recorded in 1980 as a [redacted], was found to be located partially in the project area, and the site boundary was expanded significantly during this study to include newly discovered artifacts and features. Based on the results of the current survey, the artifacts and features in the project area include a complete [redacted] along with three historic-period refuse scatters. As a result of these discoveries, Site [redacted] now encompasses almost the entire project area, with the exception of a narrow strip along the northern edge, and extends further beyond the project boundaries on the east, south, and west (see App. 3).

Due to the potential presence of buried cultural remains at the site, the historic significance of [redacted] and its qualification as a "historical resource" cannot be determined on the basis of surface findings alone. Although artifacts observed on the surface during this study suggest that the site was used mainly for lithic material procurement—which is less likely to have left a substantial amount of buried cultural deposits—instead of long-term habitation, the possibility of such deposits occurring in the project area cannot be ruled out, especially since the ground surface in the project area remains relatively undisturbed. In order to adequately evaluate the data potential of the portion of Site 15-001203 within the project area, additional archaeological investigations will be necessary, as outlined in the section below.

## CONCLUSION AND RECOMMENDATIONS

CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

In summary of the research results presented above, Site 15-001203 is known to be located partially in the project area, but its qualification as a "historical resource" under CEQA provisions cannot be determined at this time without further archaeological investigations. Therefore, CRM TECH recommends to the County of Kern that a Phase II archaeological testing and evaluation program be completed at the portion of Site [redacted] within the project area to determine the presence or absence of any substantial subsurface cultural remains.

The testing and evaluation program should consist of, at a minimum, detailed recordation and mapping of the flaking stations, surface collection of unique artifacts such as the projectile point, and subsurface excavations at the rock shelters and at a selection of dense scatters of tested stones. The Phase II study should also include laboratory analysis of recovered archaeological materials, preparation of a final report to document the findings, and permanent curation of the artifact assemblage at an appropriate facility. Further recommendations regarding the treatment of Site [redacted] will be formulated and presented on the basis of the results of the testing and evaluation program.

## REFERENCES


Anderson, M. Kat
2005 *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources*. University of California Press, Berkeley.

Blackburn, Thomas C., and Lowell John Bean
1978 Kitanemuk. In Robert F. Heizer (ed.): *Handbook of North American Indians*, Vol. 8: *California*; pp. 564-569. Smithsonian Institution, Washington, D.C.

CNPS (California Native Plant Society)
2019 A Manual of California Vegetation; online edition. California Native Plant Society, Sacramento. http://www.cnps.org/cnps/vegetation/.

GLO (General Land Office, U.S. Department of the Interior)
1856a Plat Map: Township No. 9 North Range No. 12 West, SBBM; surveyed in 1855-1856.
1856b Plat Map: Township No. 9 North Range No. 13 West, SBBM; surveyed in 1855.
1856c Plat Map: Township No. 10 North Range No. 12 West, SBBM; surveyed in 1855-1856.
1856d Plat Map: Township No. 10 North Range No. 13 West, SBBM; surveyed in 1855.

Google Earth
1994-2017 Aerial photographs of the project vicinity; taken in 1994, 1995, 2004-2006, 2008-2009, 2011-2013, 2015, and 2017. Available through the Google Earth software.

Hamilton, Eva, Ellen Beery, Olcott Bulkley, Clara McDougal, Florence Rector, Minta Thomason, Rutha Williams, and Blanche Wright
1913 *The Heart of Antelope Valley*. Antelope Valley Union High School student project, Lancaster. Reprinted in Glen A. Settle (ed.): *Here Roamed the Antelope*; pp. 19-41. The Kern-Antelope Historical Society, Rosamond, California, 1963.
Hammond, Jon
2017 Natural Sightings: Uncommon but Atill Persisting. *Tehachapi News* April 10. http://www.tehachapinews.com/lifestyle/natural-sightings-uncommon-but-still-persisting/article_9bd3c2a6-1e16-11e7-959f-af5079709eaf.html.
Hilu, Khidir W., Steve Boyd, and Peter Felker
1982 Morphological Diversity and Taxonomy of California Mesquites (*Proposis*, Leguminosae). *Madroño* 29(4):237-254.
Larson, Kenneth A.
n.d. Tropico Mine. https://www.placesearth.com/usa/california/kern/tropico/tropico1.shtml.
Lewis, C.
1980 California Historical Resources Information System record forms, Site 15-001203. On file, Southern San Joaquin Valley Information Center, California State University, Bakersfield.
Menke, J., E. Reyes, A. Glass, D. Johnson, and J. Reyes.
2013 California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan. Prepared for the California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission. Aerial Information Systems, Redlands, California.
Munz, Philip, and David D. Keck
1959 *A California Flora*. University of California Press, Berkeley.
NETR Online
1972-2014 Aerial photographs of the project vicinity; taken in 1972, 1974, 1994, 2005, 2009, 2010, and 2012. http://www.historicaerials.com.
Orme, Antony R.
2004 *Lake Thompson, Mojave Desert, California: A Desiccating Late Quaternary Lake System*. U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, Mississippi.
Scharlotta, Ian
2014 Trade Routes and Contradictory Spheres of Influence: Movement of Rhyolite through the Heart of the Western Mojave Desert. *California Archaeology* 6(2):219-246.
Schiffman, Robert A., and Catherine Lewis
1980 Archaeological Report for Prospecting Permit. On file, Southern San Joaquin Valley Information Center, California State University, Bakersfield.
Serpico, Phil
2000 *Railroading Through the Antelope Valley*. Omni Publications. Palmdale, California.
Sutton, Mark Q.
1980 Some Aspects of Kitanemuk Prehistory. *Journal of California and Great Basin Anthropology* 2(2):214-225.
Sutton, Mark Q., R.W. Robinson, and Jill K. Gardner
2009 Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California. *Pacific Coast Archaeological Society Quarterly* 42(2-3):17-90.
USGS (United States Geological Survey, U.S. Department of the Interior)
1917 Map: Elizabeth Lake, Calif. (30', 1:125,000); surveyed in 1915.

1943 Map: Rosamond, Calif. (15', 1:62,500); aerial photographs taken in 1943.
1947 Map: Soledad Mountain, Calif. (7.5', 1:24,000); aerial photographs taken in 1946, field-checked in 1947.
1971 Map: Bakersfield, Calif. (1:250,000); 1962 edition revised.
1973 Map: Soledad Mountain, Calif. (7.5', 1:24,000); aerial photographs taken in 1972, field-checked in 1973.
1975 Map: Los Angeles, Calif. (1:250,000); aerial photographs taken in 1972.

Warren, Claude N.
1984 The Desert Region. In Michael J. Moratto (ed.): *California Archaeology*; pp. 339-430. Academic Press, Orlando, Florida.

Warren, Claude N., and Robert H. Crabtree
1986 Prehistory of the Southwestern Area. In Warren L. d'Azevedo (ed.): *Handbook of North American Indians*, Vol. 11: *Great Basin*; pp. 183-193. Smithsonian Institution, Washington, D.C.

WAVHS (West Antelope Valley Historical Society)
n.d. Rosamond, CA 93560. http://www.rosamondca.us/about/default.html.

## APPENDIX 1
## PERSONNEL QUALIFICATIONS

### PRINCIPAL INVESTIGATOR/HISTORIAN
### Bai "Tom" Tang, M.A.

**Education**

| | |
|---|---|
| 1988-1993 | Graduate Program in Public History/Historic Preservation, UC Riverside. |
| 1987 | M.A., American History, Yale University, New Haven, Connecticut. |
| 1982 | B.A., History, Northwestern University, Xi'an, China. |
| 2000 | "Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno. |
| 1994 | "Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno. |

**Professional Experience**

| | |
|---|---|
| 2002- | Principal Investigator, CRM TECH, Riverside/Colton, California. |
| 1993-2002 | Project Historian/Architectural Historian, CRM TECH, Riverside, California. |
| 1993-1997 | Project Historian, Greenwood and Associates, Pacific Palisades, California. |
| 1991-1993 | Project Historian, Archaeological Research Unit, UC Riverside. |
| 1990 | Intern Researcher, California State Office of Historic Preservation, Sacramento. |
| 1990-1992 | Teaching Assistant, History of Modern World, UC Riverside. |
| 1988-1993 | Research Assistant, American Social History, UC Riverside. |
| 1985-1988 | Research Assistant, Modern Chinese History, Yale University. |
| 1985-1986 | Teaching Assistant, Modern Chinese History, Yale University. |
| 1982-1985 | Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China. |

**Cultural Resources Management Reports**

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

**PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST**
**Michael Hogan, Ph.D., RPA***

## Education

| | |
|---|---|
| 1991 | Ph.D., Anthropology, University of California, Riverside. |
| 1981 | B.S., Anthropology, University of California, Riverside; with honors. |
| 1980-1981 | Education Abroad Program, Lima, Peru. |
| | |
| 2002 | Section 106—National Historic Preservation Act: Federal Law at the Local Level. UCLA Extension Course #888. |
| 2002 | "Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist. |
| 2002 | "Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals. |
| 1992 | "Southern California Ceramics Workshop," presented by Jerry Schaefer. |
| 1992 | "Historic Artifact Workshop," presented by Anne Duffield-Stoll. |

## Professional Experience

| | |
|---|---|
| 2002- | Principal Investigator, CRM TECH, Riverside/Colton, California. |
| 1999-2002 | Project Archaeologist/Field Director, CRM TECH, Riverside. |
| 1996-1998 | Project Director and Ethnographer, Statistical Research, Inc., Redlands. |
| 1992-1998 | Assistant Research Anthropologist, University of California, Riverside |
| 1992-1995 | Project Director, Archaeological Research Unit, U. C. Riverside. |
| 1993-1994 | Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College. |
| 1991-1992 | Crew Chief, Archaeological Research Unit, U. C. Riverside. |
| 1984-1998 | Archaeological Technician, Field Director, and Project Director for various southern California cultural resources management firms. |

## Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

## Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1986.

## Memberships

* Register of Professional Archaeologists; Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

**PROJECT ARCHAEOLOGIST/REPORT WRITER**
**Deirdre Encarnación, M.A.**

**Education**

| | |
|---|---|
| 2003 | M.A., Anthropology, San Diego State University, California. |
| 2000 | B.A., Anthropology, minor in Biology, with honors; San Diego State University, California. |
| 1993 | A.A., Communications, Nassau Community College, Garden City, N.Y. |
| 2001 | Archaeological Field School, San Diego State University. |
| 2000 | Archaeological Field School, San Diego State University. |

**Professional Experience**

| | |
|---|---|
| 2004- | Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California. |
| 2001-2003 | Part-time Lecturer, San Diego State University, California. |
| 2001 | Research Assistant for Dr. Lynn Gamble, San Diego State University. |
| 2001 | Archaeological Collection Catalog, SDSU Foundation. |

**Memberships**

Society for California Archaeology; Society for Hawaiian Archaeology; California Native Plant Society; Kaua'i Museum.

**PROJECT ARCHAEOLOGIST/NATIVE AMERICAN LIAISON**
**Nina Gallardo, B.A.**

**Education**

2004 B.A., Anthropology/Law and Society, University of California, Riverside.

**Professional Experience**

2004- Project Archaeologist, CRM TECH, Riverside/Colton, California.

- Surveys, excavations, construction monitoring, field recordation, mapping, records searches, and Native American liaison.

**Honors and Awards**

2000-2002 Dean's Honors List, University of California, Riverside.

**PROJECT ARCHAEOLOGIST**
**John D. Goodman II, M.S.**

## Education

| | |
|---|---|
| 1993 | M.S., Anthropology, University of California, Riverside. |
| 1985 | B.S., Anthropology, University of California, Riverside. |
| 2005 | Training Session on Senate Bill 18; sponsored by the Government Office of Planning and Research, Riverside, California. |
| 2002 | Protecting Heritage Resources under Section 106 of the National Historic Preservation Act; sponsored by the Advisory Council on Historic Preservation, Arcadia, California. |
| 2000 | Federal Historic Preservation Law for the Forest Service; sponsored by the Advisory Council on Historic Preservation, San Bernardino, California. |
| 1994 | National Environmental Policy Act workshop; Flagstaff, Arizona. |

## Professional Experience

| | |
|---|---|
| 2011- | Project Archaeologist/Artifact Analyst, CRM TECH, Colton, California. |
| 2008- | Independent sub-contractor (faunal analyses and historical archaeology). |
| 2006-2008 | Project Director, Statistical Research, Inc., Redlands, California. |
| 2003-2006 | Project Manager/Principal Investigator, Stantec Consulting, Inc. (formerly The Keith Companies [TKC]), Palm Desert, California. |
| 2000-2003 | Supervisory Archaeologist, Heritage Resources Program, San Bernardino National Forest, United States Forest Service, Department of Agriculture. |
| 1993-2000 | Project Manager, Historical Archaeologist, Faunal Specialist, Human Osteologist, and Shell Specialist, SWCA Inc., Environmental Consultants, Flagstaff, Arizona. |
| 1982-1993 | Project Director, Staff Archaeologist, Physical Anthropologist, Faunal Specialist, and Lithic Specialist, Archaeological Research Unit, University of California, Riverside (part-time). |

## Research Interests

Subsistence practices and related technologies of both prehistoric and historical-period groups; special interest in Archaic sites of western states; ethnic/group markers; zooarchaeology/faunal analyses, lithic analyses, and historical archaeology.

## Cultural Resources Management Reports

Co-author of many cultural resources management study reports since 1986.

## Memberships

Society for American Archaeology.

**PROJECT ARCHAEOLOGIST**
**Michael D. Richards, M.A., Registered Professional Archaeologist**

## Education

| | |
|---|---|
| 2002 | M.A., Anthropology, California State University, Northridge (CSUN). |
| 1986 | B.A., Anthropology: University of California, Los Angeles (UCLA). |
| 1982 | A.A., Los Angeles Valley College, Los Angeles, California. |

| | |
|---|---|
| 2015 | Section 106 workshop. |
| 2000 | CSUN "Olmec" field excavation and lab analysis; La Venta, Mexico. |
| 1999 | Rock art recording, UCLA Extension; Little Lake, California. |
| 1998 | Rock art symposium, UCLA Extension. |

## Professional Experience

| | |
|---|---|
| 2016-2018 | Co-Principal Investigator/Archaeologist, LSA Associates Inc. |
| 2012-2016 | Co-Principal Investigator/Archaeologist, ICF International (Jones & Stokes). |
| 2010-2012 | Co-Principal Investigator/Archaeologist, various CRM firms (on call). |
| 2007-2010 | Principal Investigator/Field Director/Crew Chief, ASM Affiliates, Inc. |
| 2004-2007 | Project Manager/Co-Principal Investigator, ArchaeoPaleo Resource Management, Inc. |
| 2003-2004 | Staff Archaeologist/Crew Chief, SRI, Inc. |
| 2000-2003 | Project Archaeologist/Field Director, Ancient Enterprises (Clewlow, Jr.). |
| 1999-2000 | Staff Archaeologist/Lab Crew Chief, CSC/Edwards Air Force Base. |

## Research Interests

Pottery and rock art analysis; prehistory the American southwest; Mesoamerica; Japan.

## Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1999.

## Memberships

Society for American Archaeology; Society for California Archaeology; Archaeological Institute of America; Conejo Open Space Trails Advisory Committee; Conejo Valley Historical Society.

**PROJECT ARCHAEOLOGIST**
**Cynthia Morales, B.A.**

## Education

2014 B.A., Anthropology (*cum laude*; concentration in Archaeology), California State University, San Bernardino.

## Professional Experience

2014- Project Archaeologist, CRM TECH, Colton, California.
2014 Paleontological Field Assistant, HKA Enterprises, Santa Ana, California.
2012 Museum Studies Intern, San Bernardino County Museum, Redlands, California.

## Honors and Awards

Winter-Spring, 2014 Dean's list, California State University, San Bernardino.

## Memberships

Delta Epsilon Iota Academic Honor Society; National Society of Collegiate Scholars; Student Conservation Association.

**PROJECT ARCHAEOLOGIST**
**Damien Tietjen, B.A.**

## Education

2002 GIS Certification, University of California, Riverside.
1996 B.A., Archaeology, College of Wooster, Wooster, Ohio.

2014 HAZWOPER Training (40 hours).
2012 NFPA 70E Electrical Safety Training (8 hours).
2004 10th Annual GI/GIS Workshop, Warsaw, Poland.

## Professional Experience

2014- Project Archaeologist, CRM TECH, Colton, California.
2008-2014 Archaeologist/Environmental Compliance Monitor/GIS Specialist, Environmental Science Associates (ESA), Palms Springs, California.

## APPENDIX 2

# CORRESPONDENCE WITH NATIVE AMERICAN REPRESENTATIVES*

* A total of 10 local Native American representatives were contacted. Sample letters are included in this report.

# SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

## NATIVE AMERICAN HERITAGE COMMISSION

1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916)373-3710
(916)373-5471 Fax
nahc@pacbell.net

**Project:** Proposed Project on APN 0345-032-31 and Portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02 and -05 (CRM TECH No. 3418)

**County:** Kern

**USGS Quadrangle Name:** Soledad Mountain, Calif.

**Township** 10 North **Range** 13 West SB **BM; Section(s)** 25, 26, 35, and 36

**Company/Firm/Agency:** CRM TECH

**Contact Person:** Nina Gallardo

**Street Address:** 1016 E. Cooley Drive, Suite A/B

**City:** Colton, CA **Zip:** 92324

**Phone:** (909) 824-6400 **Fax:** (909) 824-6405

**Email:** ngallardo@crmtech.us

**Project Description:** The primary component of the project is to develop a mining operation on approximately 189 acres of land and an access road located west of Mojave-Tropico Road aned north of Beaudette Road, in the Rosamond Hills area of Kern County, California.

*December 4, 2018*

NATIVE AMERICAN HERITAGE COMMISSION
**Environmental and Cultural Department**
**1660 Harbor Blvd., Suite100**
**West Sacramento, CA 95691**
(916) 373-3710

December 12, 2018

Nina Gallardo
RM Tech

Sent by Email: ngallardo@crmtech.us
Number of Pages: 2

RE: Rosamond Hills Mine Project, Soledad Mountain, Kern County

Dear Ms. Gallardo:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

I suggest you contact all of those listed, if they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: Sharaya.Souza@nahc.ca.gov.

Sincerely,

_%$___

araya Souza
Staff Services Analyst
(916) 573-0168

Native American Heritage Commission
Native American Contacts List
W12/201B

Big Pine Paiute Tribe of the Owens Valley
Genevieve Jones, Chairperson
P.O. Box 700 — Paiute- Shoshone
Big Pine ·CA 93513
j.paydon@bigpinepaiute.org
(760) 938-2003
(976) 938-2942 Fax

Big Pine Paiute Tribe of Owens Valley
Sally ManninQ, Environmental Director
P.O. Box 700 — Paiute
Big Pine ·CA 93513
s.manning@bigpinepaiute.org
(760) 938-2003
(760) 938-2942 Fax

Big Pine Paiute Tribe of the Owens Valley
Danelle Gutierrez THPO
P.O. Box 700 — Paiute
Big Pine ·CA 93513
d.gutierrez@bigpinepaiute.org
(760) 938-2003, ext. 228
(760) 938-2942 Fax

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street — Chumash
Bakersfield 'CA 93307
chumashtribe@sbcglobal.net
661-322-0121

Kern Valley Indian Community
Julie Turner, Secretary
P.O. Box 1010 — Kawaiisu
Lake Isabella ·CA 93240 — Tubatulabal
(661) 340-0032 Cell

Kern Valley Indian Community
Robert Robinson, Chairperson
P.O. Box 1010 — Tubatulabal
Lake Isabella ·CA 93283 — Kawaiisu
brobinson@iwvisp.com
(760) 378-2915 Cell

Kitanemuk & Yowlumne Tejon Indians
Delia DominQuez, Chairperson
115 Radio Street — Yowlumne
Bakersfield ·CA 93305 — Kitanemuk
deedominguez@juno.com
(626) 339-6785

San Manuel Band of Mission Indians
Lee Clauss, Director-CRM Dept.
26569 Community Center Drive — Serrano
Highland ·CA 92346
lclauss@sanmanuel-nsn.gov
(909) 864-8933
(909) 864-3370 Fax

San Manuel Band of Mission Indians
Lynn Valbuena
26569 Community Center Dr. — Serrano
Highland ·CA 92346
(909) 864-8933

Santa Rosa Rancheria Tachi Yokut Tribe
Rueben Barrios Sr., Chairperson
P.O. Box8 — Tache
Lemoore ·CA 93245 — Tachi
(559) 924-1278 · Yokut
(559) 924-3583 Fax

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this.list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American Tribes for the proposed:
Rosamond Hills Mine Project, Soledad Mountain, Kern County.

Native American Heritage Commission
Native American Contacts List
12/12/2018

Tejon Indian Tribe
Octavio Escobedo, Chairperson
1731 Hasti-acres Drive, Suite 108 Kitanemuk
Bakersfield 'CA 93309
oescobedo@tejonindiantribe-nsn.gov
(661) 834-8566
(661) 834-8564 Fax

Tubatulabals of Kern Valley
Robert L. Gomez, Jr., Tribal Chairperson
P.O. Box 226 Tubatulabal
Lake Isabella ·CA 93240
(760) 379-4590
(760) 379-4592 Fax

Tule River Indian Tribe
Neil Pevron, Chairperson
P.O. Box589 Yokuts
Porterville ·CA 93258
neil.peyron@tulerivertribe-nsn.gov
(559) 781-4271
(559) 781-4610 Fax

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas ·CA 93906 Mono
kwood8934@aol.com Wuksache
(831) 443-9702

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American Tribes for the proposed:
Rosamond Hills Mine Project, Soledad Mountain, Kern County.

December 17, 2018

Danelle Gutierrez, Tribal Historic Preservation Officer
Big Pine Paiute Tribe of the Owens Valley
P.O. Box 700
Big Pine, CA 93513

RE: Proposed Rosamond Hills Mine Project
Portions of Assessor's Parcel Nos. 0345-294-17, 0345-031-02, and 0345-032-02, -05, and -31
189 Acres and an Access Road in the Rosamond Hills Area
Kern County, California
CRM TECH Contract #3418

Dear Ms. Gutierrez:

I am writing to bring your attention to an ongoing CEQA-compliance study for the proposed project referenced above. The project entails the development of a mine and a land reclamation plan involving approximately 189 acres and an access road in portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02, 05, and -31, owned by the CalPortland Cement Company. The subject property is located west of Mojave Tropico Road and north of Beaudette Road, in the Rosamond Hills area of Kern County. The accompanying map, based on the USGS Soledad Mountain, Calif., 7.5' quadrangle, depicts the location of the project area in Sections 25, 26, 35, and 36, T10N R13W, SBBM.

In a letter dated December 12, 2018, the Native American Heritage Commission reports that the sacred lands record search identified no Native American cultural resources within the project area, but recommends that local Native American groups be contacted for further information (see attached). Therefore, as part of the cultural resources study for this project, I am writing to request your input on potential Native American cultural resources in or near the project area.

Please respond at your earliest convenience if you have any specific knowledge of sacred/religious sites or other sites of Native American traditional cultural value in or near the project area, or any other information to consider during the cultural resources investigations. Any information or concerns may be forwarded to CRM TECH by telephone, e-mail, facsimile, or standard mail. Requests for documentation or information we cannot provide will be forwarded to our client and/or the lead agency, namely the County of Kern.

We would also like to clarify that, as the cultural resources consultant for the project, CRM TECH is not involved in the AB 52-compliance process or in government-to-government consultations. The purpose of this letter is to seek any information that you may have to help us determine if there are cultural resources in or near the project area that we should be aware of and to help us assess the sensitivity of the project area. Thank you for your time and effort in addressing this important matter.

Respectfully,

Nina Gallardo
Project Archaeologist/Native American liaison
CRM TECH
Email: ngallardo@crmtech.us

Encl.: NAHC response letter and project location map

**From**: Jessica Mauck <JMauck@sanmanuel-nsn.gov>
**Sent**: Friday, December 21, 2018 10:46 AM
**To**: ngallardo@crmtech.us
**Subject**: RE: NA Scoping Letter for the Proposed Rosamond Hills Mine Project; Portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02, -05, and -31; 189 Acres in the Rosamond Hills Area, Kern County (CRM TECH #3418)

Hi Nina,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation. This project is actually just north of SMBMI's ancestral territory boundary, and so I have no information to provide to you for your study.

However, I do want to mention that nearby Willow Springs is highly sensitive to SMBMI, and there is a large and very complex situation within the very northwestern corner of Edwards AFB (there is early talk about making it an archaeological district). This project area may have served as a lithic source for these two habitation areas, and maybe some places to the north, and so I wanted to throw that out there for CRM Tech's use in their study.

Thank you,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive
Highland California 92346

**APPENDIX 3**

# CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORD FORMS

**Site 15-001203 (CA-KER-1203)**

***Confidential; Not for Public Circulation***

Appendix E.2

# A Phase II Cultural Resources Investigation of the Cal-Portland Rosamond Hills (Gem Hill) Project Area in the Rosamond Area of Kern County (redacted version)

# A PHASE II CULTURAL RESOURCES INVESTIGATION OF THE CAL-PORTLAND ROSAMOND HILLS (GEM HILL) PROJECT AREA IN THE ROSAMOND AREA OF KERN COUNTY, CALIIFORNIA

-USGS Soledad Mountain Quadrangle, rev. 1973-
-Township 10 North; Range 13 West, S.B.B.M.-
-Section 36-

Prepared for:

Cal-Portland Company
Attn: Paul L. Martin
2025 E. Financial Way
Glendora, California 91741

Prepared by:

McKENNA et al.
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Job No. 04-19-06-1985
June 26, 2019
**REDACTED July 12, 2022**

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# A PHASE II CULTURAL RESOURCES INVESTIGATION OF THE CAL-PORTLAND ROSAMOND HILLS (GEM HILL) PROJECT AREA IN THE ROSAMOND AREA OF KERN COUNTY, CALIIFORNIA

by,

Jeanette A. McKenna, Principal
McKenna et al., Whittier, CA

## INTRODUCTION

In March, 2019, CRM Tech of Colton, California, completed a Phase I cultural resources investigation of the proposed Rosamond Hills project area (Gem Hill) in the unincorporated area of Rosamond, Kern County, California. CRM Tech surveyed approximately 190 acres of land located in portions of Township 10 North, Range 13 West, and Sections 25, 26, 35, and 36 (S.B.B.M.). This area was also cross referenced as Kern County Assessor Parcel Nos. 0345-294-17, 0345-031-02, 0345-032-02, 0345-032-05, and 0345-032-31. Subsequently, and based on their finding, CRM Tech recommended a Phase II testing program to address the resources identified during their survey. The current study was initiated by McKenna et al. in response to the CRM Tech recommendations and the refinement of the area of potential effects (APE) from 190+/- acres to less than 30 acres.

## CRM TECH FINDINGS AND RECOMMENDATIONS

In summarizing the proposed project, CRM Tech noted that 190 acres of land were surveyed for cultural resources, but only 80+/- acres would be subjected to disturbances. The project area would include a quarry, processing plant, and various roads, including a main access road leading to Mojave Tropico Road (Hogan et al. 2019:i). An intensive survey of the 190 acres was completed by five professional surveyors over the course of two working days. Research confirmed only a small portion of the project area was previously surveyed – involving the access road and as part of a study completed due east of the defined project area.

One site, [redacted], was identified as extending into the project area. The initial recording of this site defined limited boundaries based on the limits of the survey area and not based on the distribution of cultural materials.

The CRM Tech reporting discussed the additional resources within the project area and incorporated these resources into a redefined boundary for [redacted]. Lewis (1980) recorded [redacted] Lewis also noted the use of the area as a “uranium” mining claim (proposed Ashland Uranium, Inc. claim; ca. 1979, not realized). In 1979, cultural resources were not addressed and the proposed mining activities were declared to have no adverse environmental impacts.

In 1980, Martin Trost Associates requested an assessment of cultural resources, resulting in the initial identification of [redacted] More evaluation, including surface collection and survey of adjacent areas would be needed before a determination for National Register Status could be made.”

Despite the recommendations presented in 1980, no mining commenced and no testing of [redacted] was undertaken. Almost forty years later, in 2019, CRM Tech initiated their survey in the 190 acres west of the Schillman and Lewis survey area. As noted, they concluded [redacted] extended to the west and essentially included all of the 2019 survey area. This conclusion meant all of the current Cal-Portland project area was/is within the mapped boundaries of [redacted]. The 2019 CRM Tech Phase I survey report (Hogan et al. 2019:12) stated:

[redacted]

[redacted]

[redacted]

CRM Tech (2019:15) concluded, based on the extent of resources covering the 190 acre Cal-Portland property and adjacent acreage, [redacted] (15-01203) warranted additional research prior to the approval of the proposed project. Specifically, CRM Tech recommends "… testing and evaluation … at a minimum, detailed recordation and mapping of the flaking stations, surface collection of unique artifacts such as the projectile point, and subsurface excavations at the rock shelters and at a selection of dense scatters of tested stones. The Phase II study should also include laboratory analysis of recovered archaeological materials, preparation of a final report to document the findings, and permanent curation of the artifact assemblage at an appropriate facility."

Subsequent to making these recommendation, the project area boundaries were redefined and now involve less than 30 acres (of the original 190 acres) and this acreage includes the access road from the Mojave/Tropico Road and areas relatively close to the Mojave/Tropico Road (north the northern or eastern extents of the originally defined project area).

Of the many resources identified by CRM Tech, only five resources were mapped as being within or relatively close to the redefined APE. These resources have been defined by NAD 83 and NAD 27 coordinates and, based on these coordinates, tentatively identified through correlation with the CRM Tech survey map (Table 1). Given the potential error factor, each of these points may reflect an area of up to five meters in diameter.

Each of these resources was a surface find and, despite references to partially buried items, the relative depths were considered shallow, given the nature of exposed bedrock and the shallow soil contexts.

## McKENNA et al. INVESTIGATIONS

In response to the recommendation for a Phase II cultural resources investigation of the resources identified by CRM Tech, McKenna et al. prepared a proposed scope of work more in line with the redefined project and the five resources within or near the project area. This scope included:

1. Research into the property-specific history of the project area and any prior impacts to the area;

2. Record historic resources in the area that have not been subjected to recordation in the past (e.g. Mojave/Tropico Road);

| Table 1. Resources Identified by CRM Tech (2019) as within or near the Currently Defined APE. | | | | | |
|---|---|---|---|---|---|
| No. | NAD 83 | | NAD 27 | | Description |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

3. Relocated the resources identified by CRM Tech and complete the evaluation of the resources;

4. Recover the artifacts identified within the APE, as recently redefined;

5. Assess any features (e.g. rock circles) to determine dates (e.g. prehistoric or historic); and,

6. Prepare a report documenting the findings and include additional recommendations, if warranted.

## PROJECT AREA AND SETTING

The current project area (30+/- acres) is located west of the Mojave/Tropic Road and north of the community of Rosamond (also north of the Burton Gold Mine). More specifically, the project area is limited to areas within Township 10 North; Range 13 West; and the northwestern quarter of Section 36 (Figure 1). A very small portion of the proposed APE may extend into the eastern portion of Section 35, but this area is negligent. The proposed grading plan will be limited to Section 36 (Figure 2).

CRM Tech provided a summary of the natural setting for their larger project area and this discussion is still applicable for the refined project area. It reads:

> "The project area is situated in the Rosamond Hills in the northern Antelope Valley, and to the northwest of the unincorporated community of Rosamond. Lying on the western rim of the Mojave Desert, the Antelope Valley is typical in climate and environment of southern California's desert country, marked by extremes in temperature and aridity. The mean minimum temperature in winter is 28º F and the mean maximum temperature in summer reaches 96º

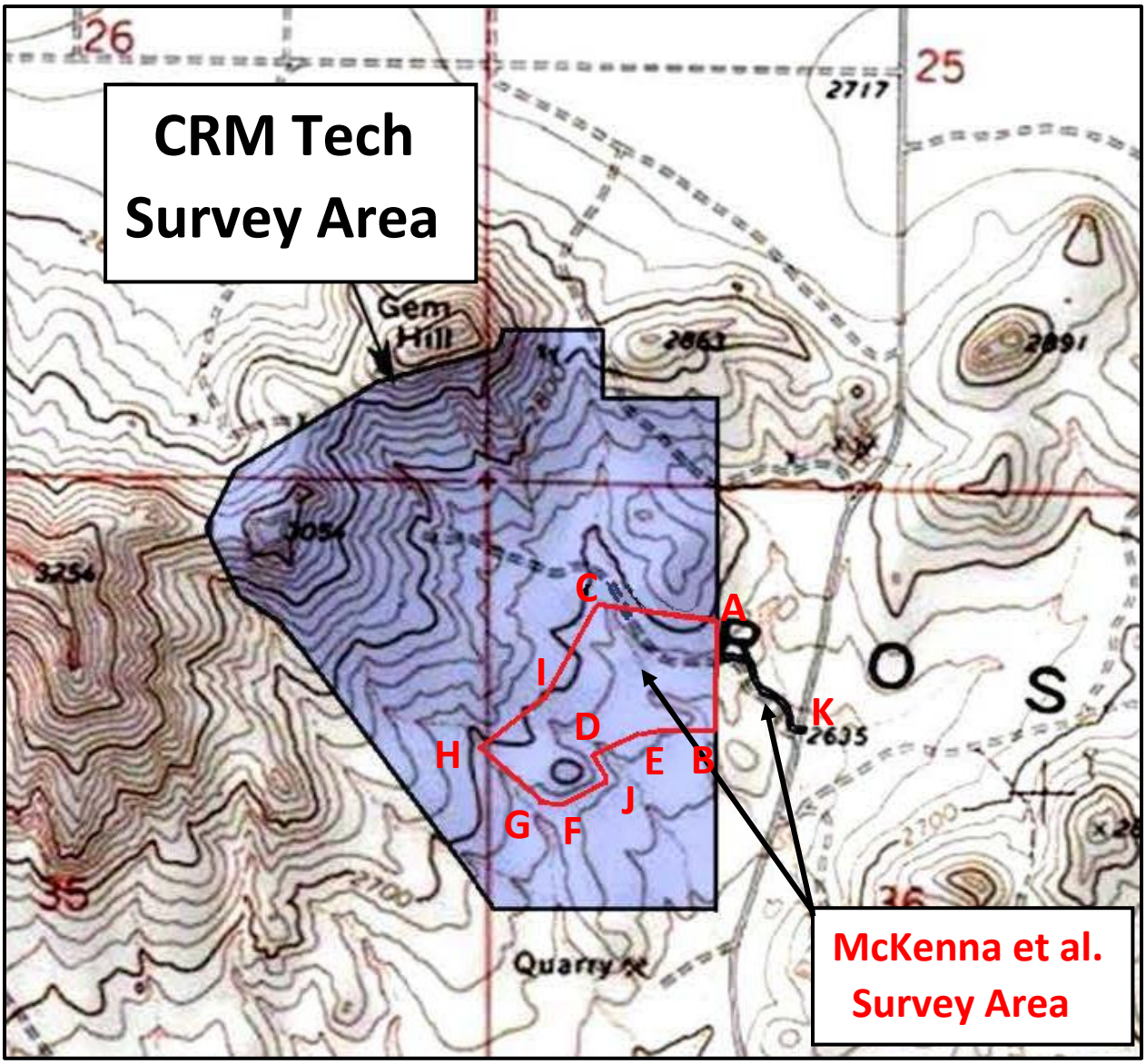



Figure 1. McKenna et al. Survey Area, USGS Soledad Mountain Quadrangle.

UTM Coordinates: (NAD 27/Top and NAD 83/Bottom, respectively)

A. 388966E/3864569N
388886E/3864765N
B. 388966E/3864384N
388886E/3864580N
C. 388752E/3864669N
388672E/3864765N
D. 388801E/3864345N
388721E/3864541N
E. 388900E/3864383N
388820E/3864579N
F. 388744E/3864206N
388664E/3864402N
G. 388687E/3867222N
388607E/3864418N
H. 388589E/3864328N
388509E/3864524N
I. 388689E/3864405N
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J. 388827E/3864274N
388747E/3864470N
K. 389129E/3864379N
389048E/3864574N

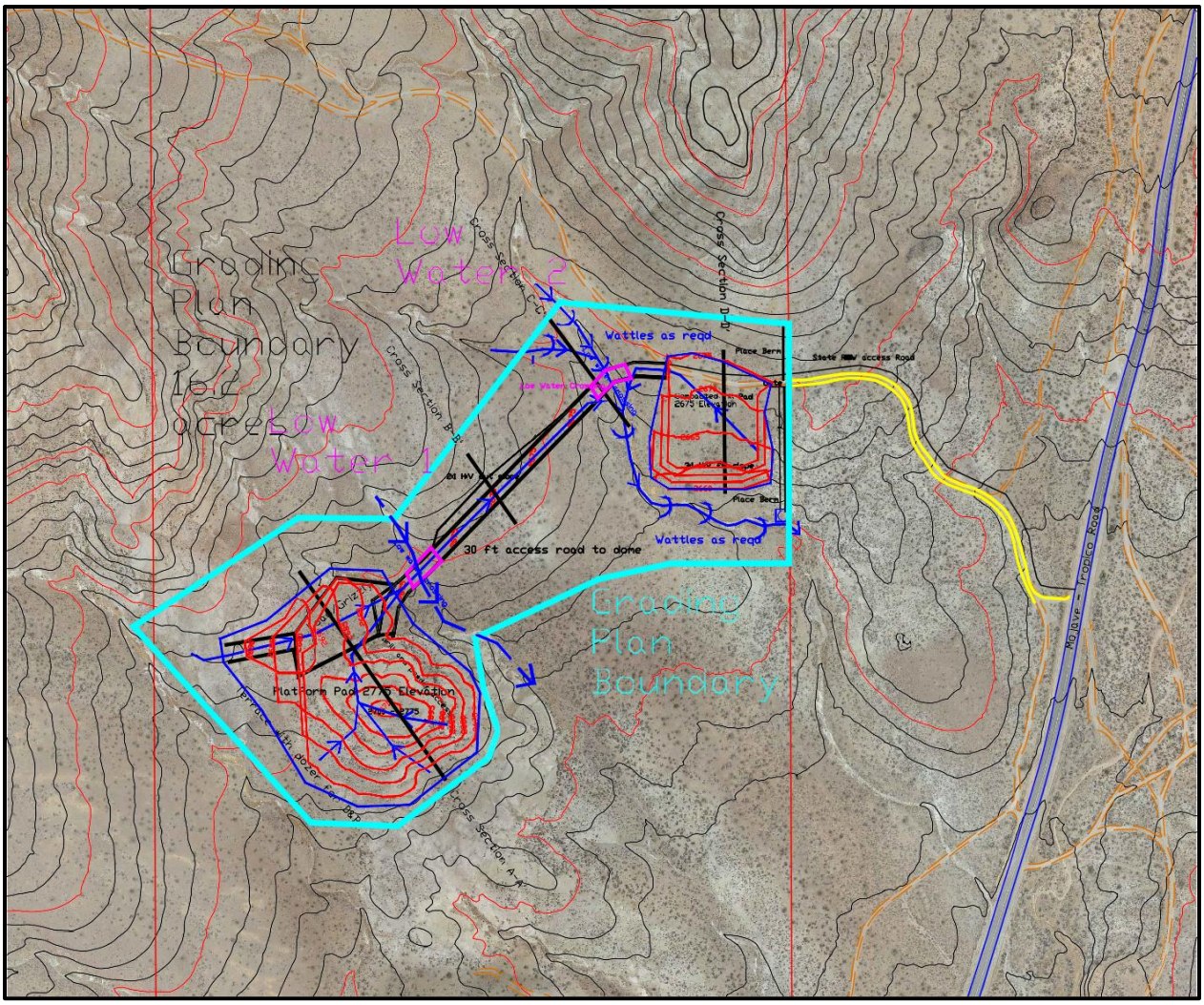



Figure 2. Boundaries for the Approved Grading Plan.

F, with temperatures over 100°F not uncommon. The average annual precipitation is around 8-12 inches, most of which occurs between November and March.

"Surrounded by open desert land, the project area extends across steep hills, precipices, and both deep and shallow erosional cuts, but is generally level with occasional low mounds that rise towards the north … Elevations range from approximately 2,620 feet above mean sea level near the southern end to nearly 3,000 feet above mean sea level at some places along the northern project boundary. Surface soils generally consist of decomposing granite, ranging from gravels to fine sands, and much of the surface area contains small to medium colluvial rocks with well-developed desert varnish …

"The property is located in the Western Mojave Mountains and Valleys Zone (Menke et al. 2013). Munz and Keck (1959) classified the vegetation community of this part of the Mojave Desert as Coastal Sage Scrub while the California Native Plant Society, using a newer classification system, considers the area a part of the *Atriplex lentiformis* (Quailbush scrub) Alliance (CNBPS 2019). Other plants from the vegetative community observed within the project boundaries include saltbush, creosote, ephedra, and desert grasses, as will as a single Joshua tree."

## CULTURAL CONTEXT

The current project area is located in an area that was used during prehistoric periods, but also associated with historic and modern periods of use. The prehistoric context was presented by CRM Tech (2019:5-6), while the historic period into the modern period has been supplemented by more recent research. The CRM Tech context is presented below:

### Ethnohistorical Context

"The present-day Rosamond area lies on the southern edge of the traditional homeland of the Kitanemuk, a small Native American group located principally on the southern and western flanks of the Tehachapi Mountains (Blackburn and Bean 1978). Although their general ecological adaptation and subsistence technology differed little from that of their neighbors to the north or west, the Kitanemuk would descend to the Antelope Valley floor to take advantage of seasonal desert resources and engage in trade. Prior to European contact, the Antelope Valley was a nexus of goods exchange between the Kitanemuk and other nearby tribal groups, including Vanyumé, Serrano, Tataviam, and interior Chumash (Sutton 1980; Sutton et al. 2009; Scharlotta 2014).

"Desert resources utilized by the Kitanemuk of food, medicine, and utilitarian purposes would have included Joshua tree for cordage, dye, and edible blossoms; creosote, ephedra, and salt bush for medicine and firewood; and various cacti for food. In [the] wetter paleo-environment of the late Pleistocene and early Holocene, the region was the site of Lake Thompson (Hilu et al. 1982; Orme 2004; Sutton et al. 2009). The receding of the lake has left behind three dry lakes in the region, including Lake Rosamond, that still flood during storm events (Orme 2004). The area would have hosted desert grasses, the seeds of which were collected with seed beaters, and stands of mesquite (Hilu et al. 1982). As the name implies, pronghorns were plentiful in the valley during prehistoric times (Hammond 2017).

> "Linguistic evidence through the use of similar familial terms suggests the presence of some form of the patrilineal system found elsewhere in southern California, but the lineages were not totemic, nor was there evidence of moieties. Precise data on the demographic characteristics and political organization of the Kitanemuk can no longer be obtained. However, archaeological evidence point[s] to a somewhat stratified society. It is known ethnographically that each village had a chief, ceremonial manager, messengers, and shamans (Blackburn and Bean 1978:567). The Kitanemuk utilized formal cemeteries, and excavations have revealed the presence of grave goods implying status among tribal members (Sutton 1980:218). These grave goods include trade items from the Santa Barbara coast, San Joaquin Valley, and eastern Mojave Desert (*ibid.*).
>
> "The Kitanemuk may have had contacts with the Spanish colonizers as early as the 1770s, and disease and epidemic[s] that may have preceded them along heavily utilized trade routes had an enormous impact on this small group (Sutton et al. 2009). During the Spanish and Mexican Periods, the Kitanemuk were apparently represented at the San Fernando, San Gabriel, and San Buenaventura Missions. After the American annexation of Alta California, some Kitanemuk were found on the Tejon Reservation in the 1850s, and later on at the Tule River Reservation, where some of their descendants still reside."

## Historic Context

As noted by CRM Tech (Hogan et al. 2019), the earliest known contact with the prehistoric Kitanmuk came in ca. 1772, then Spanish explorers entered the Antelope Valley , followed later by the Francisco Garcés Expedition, Jedediah Smith, Kit Carson, and John C. Fremont. Contact was considered minimal and did not impact the general region. Through the 19th century, the valley was subjected to some limited hunting and crossings, but again with little impacts.

In the late 19th century (1876) the Southern Pacific Railroad (SPRR) established their line between the San Joaquin Valley and the Los Angeles basin, via the southern extent of the Antelope Valley. The railroad established various water stations along the route and, subsequently, opened the areas along the railroad route to settlement, primarily related to servicing the railroad needs. On such water stop was named "Rosamond" and a small community grew around this station in ca. 1877 (Larson n.d.; West Antelope Valley Historical Society n.d.; Kern Antelope Historical Society, Inc. 1967; Kern County Historical Society 1984; Darling 1988).

The first Rosamond Post Office was opened in 1885 and the main activities associated with the community were the railroad, cattle ranching, and clay mining.

Mining was initiated in the Antelope Valley by the Dr. L.A. Crandall claim (aka Crandall Hill; 1868), extracting the clay. The original uses of the clay were to manufacture clay pipes and building materials for the City of Los Angeles. Eventually, the materials were mined for finer products, as ceramic tableware. McKenna (1987) stated:

> "The Franciscan Ware Plant [Tropico] in Glendale, California, formerly owned by Gladding, McBean & Co., has a long history involving several parent companies dating back to the turn of the century. It is also associated with a number of prominent Los Angeles investors and town-builders, and is linked to the development and extension of the Los Angeles area railroad system. The early history of manufacturing at what was to become the Franciscan Ware Plant does, in fact, exhibit all of the characteristics of a typical industrial California "boom town" as financed by speculative investment …
>
> "The story actually begins in the 1880s, with the development of several small community centers in an area known as Glen Dale. The northern portion of this area was incorporated as Glendale in 1906. The southern portion of this area was, however, known locally as Tropico, and it clung to its distinct identity. This identity crystallized on July 14, 1900 with the formation of the Tropico Improvement Association, which was organized to promote the community of Tropico. Prior to 1900, Tropico consisted of a general store, blacksmith and livery stable, real estate offices, a depot, and very few other small businesses, located at the foot of what is now Central Avenue along San Fernando Road. There was no large-scale industrial manufacturing in the area. But, in 1903, an interurban line was secured through the efforts of the Tropico Improvement Association, literally paving the way for an extended period of growth including the establishment of pottery and tile works at the northwest corner of the intersection of the Southern Pacific railroad tracks and Tropico Avenue, now known as Los Feliz Boulevard.
>
> "In 1900, Griffith J. Griffith, a prominent Los Angeles landowner who had donated a large tract (3,015 acres of his Rancho de Los Feliz property) to the City of Los Angeles for use as a city park. He was, among other duties, president of the Pacific Art Manufacturing Co., with offices located in the Bryson Building in downtown Los Angeles. Mr. Joseph Kirklan served as manager of the company (Los Angeles Directory, 1900). At the same time, a Mr. W.C.B. Richardson owned a 671 acre parcel of land on the east side of the Los Angeles River, in what is today Glendale … which he named Rancho Santa Eulalia. In 1872, he donated 16 acres of property for construction of a depot for the Southern Pacific Railroad …"

With the establishment of the depot in Glendale (Tropico), the activities in Rosamond were connected, by rail, to the manufacturers in Los Angeles. Both Griffith and Richardson became major investors. Another major investor in the Los Angeles manufacturing community was Ezra Hamilton, who owned a facility manufacturing clay pipe and fire bricks. His need for an inexpensive source of clay led him to purchase the Crandall property in Rosamond (ca. 1885-86). Eventually, Hamilton purchased the Lido, Fairview, and Tropico claims. Shortly after the purchase, it was noticed that the clay being shipped to the Los Angeles and Glendale facilities contained evidence of gold. Hamilton shifted his mining activities from simple clay extraction to gold mining, resulting in another boom in the Rosamond area.

The Hamilton mining operations continued for many years northwest of Rosamond, but not as far north as the current project area at Gem Hill. The operation at Crandall Hill (later the Lido Mine and/or the Burton Gold Mine) continued into the 1950s. The facilities are now a ghost town, but still extant.

Although the current project area is not associated with the Burton operations, it is worth noting the Burtons'' significant role in the history of Rosamond. The Burtons arrived in the Antelope Valley in ca. 1894, having come from Southend-of-the-Sea, England, and engaged in agriculture and livestock. The patriarch, Willian M., is credited with introducing alfalfa to the area. His wife, Millicent Botwright [aka Boatwright] died around 1900, leaving four sons: Sidney, H. Clifford, Cecil F. and Alec G, all born in England. Within a few years, the Burton farm was failing and William opted to leave the area, settling in British Columbia, Canada. His sons, with the exception of H. Clifford, joined him. H. Clifford Burton decided to give gold mining a try and, between 1904 and 1908, was involved in various mine between California and Idaho. He studied assaying and mining in Los Angeles and returned to the Antelope Valley between 1908 and 1910, taking a job at the Tropico Mine near Rosamond where he eventually was promoted to the position of Superintendent (ca. 1912). As Superintendent, he convinced his brother, Cecil F., to join him. They eventually convinced Alec to return and get involved in mining. All three brothers serviced in WWI and returned to the area in 1919.

By 1928, they had purchased the Tropico Mine and established “Burton Bros.”, which also owned the Soledad Extension Mine, Cactus Queen Mine, and the Ruth Mine, among other holdings. Their activities were primarily gold mining and the family was active in gold mining until 1958, when the Burton Bros./Tropico Mine was closed. Extended family are still in the area, including members of the Settles family, who operated the Tropico Gold Mine historic park into the 1980s-1990s.

The current project area is well outside the boundaries of the Burton Bros. holdings, but over two miles north of the Tropico Mine. Known generically as Gem Hill, this area was illustrated on various maps between 1855 and 1947, and failing to identify any significant activities in the area, save some dirt access roads (Figures 3-6). In 1855-1856, the Gov-

ernment Land Office map illustrates the area with a north/south trending ridge between Sections 35 and 36 and what appears to be a drainage or short road to the east of the larger (190 acre) Cal-Portland project area. This alignment was added to the map and not original to the map. No structures are present.

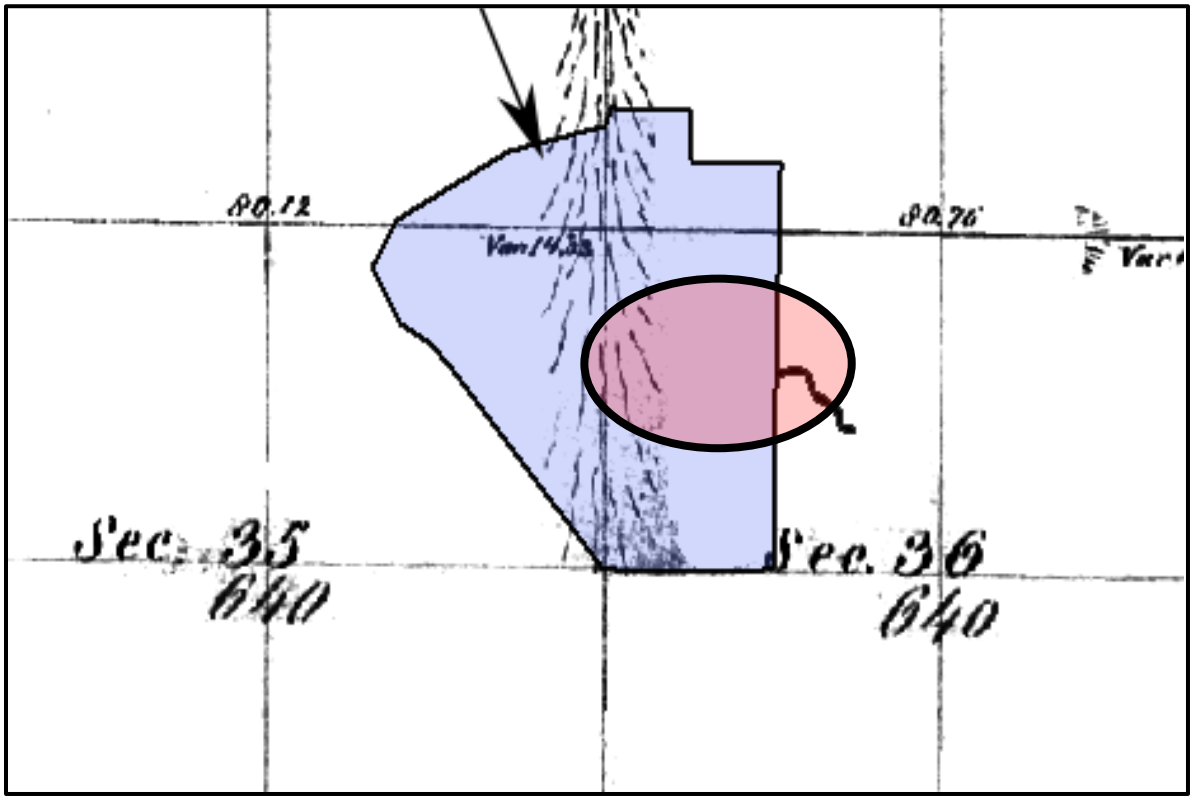



Figure 3. Government Land Office Map of 1855-1856.

By 1915-1917, the USGS Quadrangle illustrated the present of the Mojave/Tropico Road alignment to the east of the property and its southern extension toward the Rosamond/ Willow Springs communities. Here, there is a suggestion of a short road extending from the Mojave Tropic Road into the Gem Hill area, but, as noted above, this alignment was added to the maps. Still, no structures are present. By 1943, the road system (mainly dirt access roads) are located south, east, and north of Gem Hill, primarily accessing areas outside the current project area.

The presence of roads established between the 1920s and 1940s can tentatively be traced to the "rock hound area" of the 1930s, as cited in Kern County Place Names (Darling 1988:51). This particular area of Gen Hill was noted as the location of weekend, amateur excursions by "rock hounds" looking for "gems." No formal mining was undertaken, just surface hiking and the reclamation of "pretty rocks" from the surface.

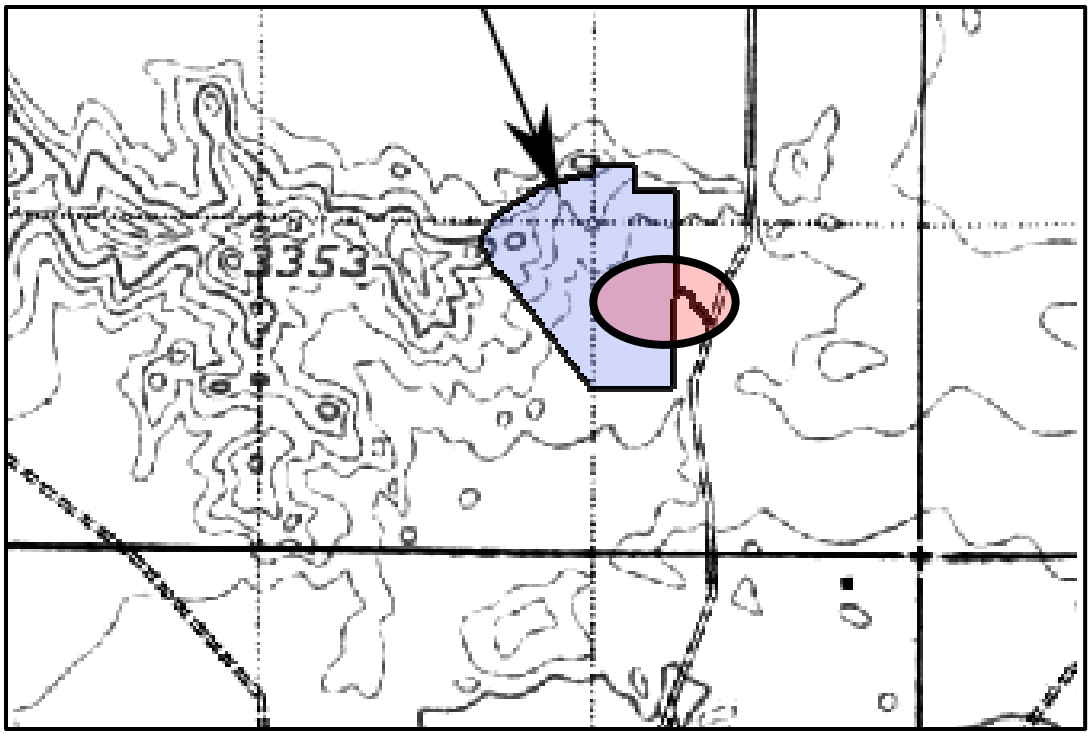



Figure 4. USGS Quadrangle of 1915-1917.

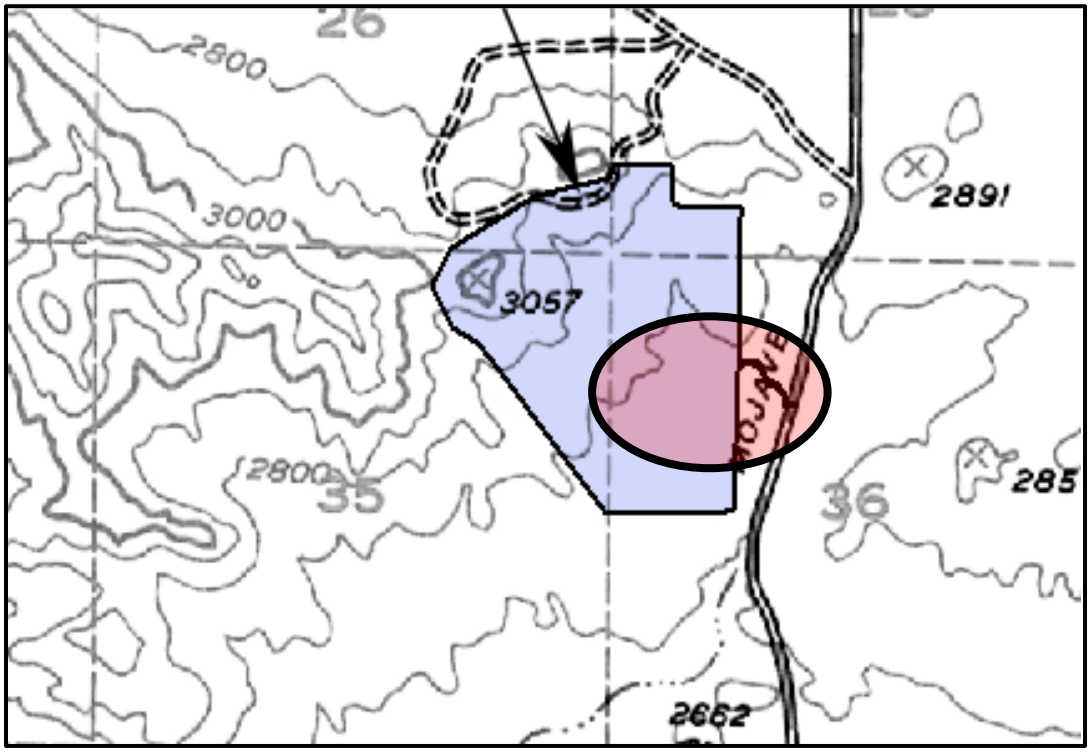



Figure 5. USGS Quadrangle of 1943.

MinDat (mining data) describes the area of Gem Hill as a "… summit and semi-precious gem occurrence … NW of Rosamond" (https://www.mindat.org). This same source identifies the presence of the Gem Hill Formation, Kinnick Formation, and Pickhandle Formation, consisting of Tertiary pyroclastic and volcanic mudflow deposits. The lithology consists of rhyolites, dacites, andesites, and basalts (Lewis 1942; Troxel and Morton 1962; Sheppard and Gude 1964; Murdoch and Webb 1966; and Pemberton 1983).

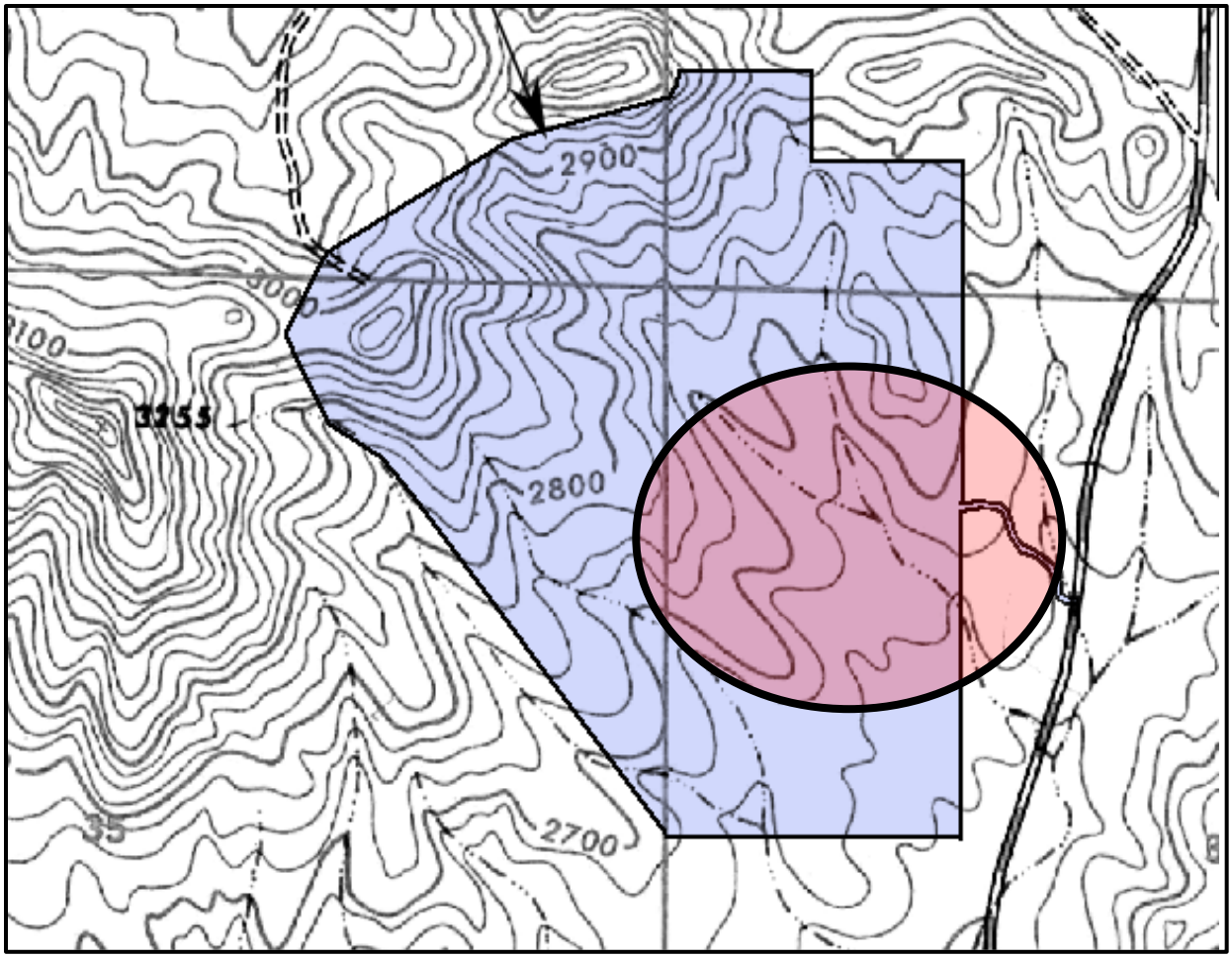



Figure 6. USGS Quadrangle of 1946-1947.

MinDat also identifies nearby properties as the Kitty Kat Prospect, Rosamond Uranium Prospect, Rosamond Prospect, Rosemond Mojave Prospect, Stillwell Property, and Verde Development Company properties. None of these entities have been identified within the current project area. No maps were found that illustrate the presence of known prospects in or immediately adjacent to the project area, although there has been obvious mining activities to the north and south of the area.

## Summary

Based on the data provided by CRM Tech (2019) and the recently completed research for the Gem Hill project area, McKenna et al. has concluded there is ample evidence to relocate known prehistoric resources, likely identified additional prehistoric resources, and there is a potential for some scant evidence of historic era resources. It is more likely, however, that evidence of recent (modern) use of the area will be identified in the form of off-road riding, modern hearths and refuse, and/or evidence of hunting or target shooting (target shooting being observed on adjacent properties).

## METHODOLOGY

As previously noted, McKenna et al. approached this investigation with the knowledge of project area boundary changes and a limited area requiring attention. There is a profession-wide policy of avoiding impacts to archaeological resources, whenever reasonably feasible. As such, testing and/or data recovery is not undertaken unless a resource cannot be avoided (via project design or other constraints).

In this case, the redefined project area boundaries negated the need to impact most of the resources identified by CRM Tech. These resources are all considered components of the larger site [redacted]. As such, when assessing the relative significance of the individual components (features or isolates), the whole site is taken into consideration. To adequately address the redefined project area, McKenna et al. completed the following tasks:

1. Research into the property-specific history of the project area and any prior impacts to the area.

   Property-specific research involved a review of the data provided by CRM Tech; research at the Kern County Historical Society; the Kern Antelope Valley Historical Society; and the local history section at the Public Library, Rosamond. McKenna et al. also consulted the Bureau of Land Management, General Land Office files (patents, mining claims, etc.); and data on file with MinDat (on line). McKenna et al. also interviewed descendants of the Burton Brothers (Keith Rahder, nephew of the Burton Bros.; Jonathan Burton Rahder, grand-nephew) and relied on prior research into the Tropico mines and their relationship to the Los Angeles industries and investors.

2. Record historic resources in the area that have not been subjected to recordation in the past.

McKenna et al. contacted the South San Joaquin Valley Information Center in Bakersfield, and acquired the supporting documentation pertaining to the previous research for this project (see summary in Appendix B). This research including obtaining the pertinent site records and copies of reports completed within or adjacent to the project area. All of this data was reviewed and incorporated into the report (see Previous Research discussion). Research also confirms the alignment for Mojave/Tropico Road is a historic period roadway and has recorded this alignment on the appropriate DPR-523 forms (Appendix F).

3. Relocated the resources identified by CRM Tech and complete the evaluation of the resources.

   When proposing the scope of work for this project, McKenna et al. planned to relocate the items recorded by CRM Tech in or near the boundaries of the current project area (5 loci). However, upon visually inspecting the 25-30 acre project site, it was determined to be more efficient and reasonable to complete a supplemental intensive survey of the project area. McKenna et al. completed this survey over the course of two field day (averaging approximately 15 acres per day), with the intention to relocate the CRM Tech loci and, if necessary, record and/or collect any other resources that may be identified.

   McKenna et al. completed the survey by identifying the northern boundary of the project area and walking east/west transects to the southern boundary. When reasonable, landforms, e.g. drainages or roads, were used to subdivide the property into manageable sections. The field survey was completed by Jeanette A. McKenna, Principal Investigator for McKenna et al. on May 30 and 31, 2019. The surveyor carried a Garmin GPS unit for recording locational data and supplemented the survey with field notes (on file, McKenna et al.) and a full photographic Record (Appendix D). Identified artifacts were recorded by GPS location(s), photographed in the field, and recovered, as deemed reasonable (e.g. rock rings were not recovered (bagged with all pertinent data), but isolated artifacts were). Historic and/or modern artifacts were not recovered, but inventoried and noted.

4. Recover the artifacts identified within the APE.

   The artifacts recovered by McKenna et al. have been washed, re-bagged (as deemed necessary) and, if determined to be non-artifacts, deaccessioned. The artifact collection has been boxed and prepared for curation – likely with the repository at California State University, Bakersfield.

5. Assess any features (e.g. rock circles) to determine dates (e.g. prehistoric or historic).

   The basic definition and intent of a Phase II testing program is to determine whether or not identified resources are significant (per federal and state guidelines and policies) and, if found to be significant, provide recommendations to lessen any potentially adverse impacts to a level of insignificance. The preferred method is to avoid the resources (and, as a result, protect the resources). If the resources cannot be reasonably avoided, recovery of the artifacts using profession standards, including analysis, is undertaken. If the resources are identified as significant by the Phase II program, avoidance or data recovery may be recommended. McKenna et al. addressed this project area with the intention of identifying the extent of resources within the boundaries of the project area and assess whether or not these resources are significant components of the larger [redacted] site.

6. Prepare a report documenting the findings and include additional recommendations, if warranted.

   McKenna et al. has prepared this report in compliance with the data requirements defined by the California State Office of Historic Preservation (OHP), but also with the authority to present the data in a manner that best serves the resources and their relation to the proposed project. All pertinent data has been presented, either in the body of this report or in the attached appendices.

## NATIVE AMERICAN CONSULTATION

CRM Tech conducted Native American consultation through contact with the Native American Heritage Commission and the mailing of letters to ten of the fourteen Native American representatives listed by the Native American Heritage Commission. In their report (Hogan et al. 2019) CRM Tech reported a single response. The San Manuel Band of Mission Indians noted the project area is outside their ancestral traditional boundaries, but also emphasized Willow Springs as being a sensitive location for resources associated with the Serrano. Mauck (2018) stated the "… project area may have served as a lithic source for [these] two habitation areas, and maybe some places to the north …".

McKenna et al. did not send out new letters regarding this project, but did contact the Native American Heritage Commission to obtain an updated letter and referral list. McKenna et al. received a letter similar to that received by CRM Tech (Appendix C), but a referral list with only nine Native American listings. In this case, The San Manuel Band of Mission Indians, Big Pine Paiute Tribe of the Owens Valley, and Chumash Council of Bakersfield were not included in the more recent correspondence.

For SB-18 and/or AB-52 consultation, McKenna et al. recommends the County consider consultation with the larger listing, to insure adequate consultation.

## PREVIOUS RESEARCH

As noted, research into the previous research for this particular project was initiated by CRM Tech (2018) and supplemented by McKenna et al. (2019). Both sets of research addressed the project area and a one mile buffer around the project area boundaries. As reported by CRM Tech, six previous studies were identified within the one mile radius, including one study that included the main access road to the current project area (off Mojave/Tropico Road. Their corresponding map identified these six studies.

The McKenna et al. supplemental research resulted in the Southern San Joaquin Valley identifying and providing these six reports (Table 2).

Table 2. Cultural Resource Studies Identified within One Mile of the Current Project Area.

| Report | NADB | Citation | Description | Re-sources |
|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

**Report 114-00338** (KE-0303) was prepared by Brock and Davidson in 1992 and addressed the entire 640 acres of Township 10 North, Range 12 West, Section 31. This property is due east of the current project area and approximately .75 miles east. Brock and Davidson identified this study as a “reconnaissance” survey, but their field methods suggested it was an intensive survey. The survey was completed by three surveyors over the course of four filed days and stated 88 person hours in the field. Given this coverage, McKenna et al. interpreted to coverage to be 88 hours per surveyor. As such, the crew covered approximately 160 acres per day, or 53 acre per person/per day. This confirms a reconnaissance level of surveying, not an intensive survey.

Regardless, this survey resulted in the identification of two prehistoric sites [redacted] as well as nine isolated artifacts. [redacted]

[redacted]

**Report 114-00496** (KE-0827) was completed by Parr (1990) for Tentative Tract No. 5182, approximately 160 acres of land in Township 10 North, Range 13, West, Section 27. Parr reported the presence of four prehistoric sites and one isolated artifact, including [redacted] Parr recommended mapping and recovery of the resources.

**Report 114-00562** (KE-1823) was completed by Yohe in 1991 and addressed a 350 acre project area located is irregular properties (not necessarily contiguous) within Township 9 North, Range 13 West, Section 6 and Township 10 North, Range 13 West; Section 32 (closer to the current project area). Yohe reported the presence of twelve archaeological sites (four previously reported) and three isolated artifacts. These sites include:

[redacted]

Yohe recommended mapping and collections at [redacted] and no further studies at the remaining lithic scatters and trail. All of these resources are sufficiently distant as to not be impacted directly or indirectly by the proposed Gem Hill project.

**Report 114-01347** (KE-1347) was prepared by Schiffman (1989) for Parcel Map No. 9166, a ten acre property to be subdivided into four 2.5 acre parcels. As mapped, this property is within Township 10 North, Range 12 West, Section 1, due south of the current project area. Schiffman reported no resources within this project area.

**Report 114-01453** (KE-0941) was prepared by Pruett (1990) and addressed 20 acres of land in Township 9 North, Range 13 West, Section 2; southwest of the current project area. Pruett reported the [redacted] Pruett recommended avoidance, but also noted that if avoidance was not possible, mapping and recovery be undertaken.

**Report 114-01481** was prepared by Schiffman (1980) and addressed the Martin Trost & Associated Prospecting Permit project area. This report covered the area directly to the east of the Cal-Portland 190 acre property and included a survey of the access road off the Mojave/Tropico Road. Although this survey area was relatively small, it was surveyed by four surveyors on June 17, 1980, and led by Schiffman. The property was identified as consisting of [redacted] This site was identified as [redacted] and the mapped boundaries were limited to the project area boundaries. Schiffman noted the site was much larger, but not fully surveyed.

The eight resources identified within the larger research area included seven sites and one isolated artifact (Table 3).

Table 3. Cultural Resources Identified within One Mile of the Current Project Area.

| Primary No. | Site No. | Citation | Description |
|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] |

In addition to the data presented above, it is noted CRM Tech completed the Phase I studies for the proposed Rosamond Hills project (190 acres) and redefined the boundaries for [redacted]. As previously noted, CRM Tech reported the presence of three rock shelters; six rock rings (possible hearths/possibly modern); a single projectile point; and numerous lithic scatters with evidence of testing and reduction activities; and two fragments of ground stone. The mapping of these resources showed them to be widely scattered throughout the 190 acres, with the rock shelters being well outside the current project area APE. Coordinates for the points identified by CRM Tech were not presented in the report, but subsequent correspondence resulted in the identification of the three resources within the APE and two others relatively close (see Table 1).

As a result of the previous research completed within one mile of the Cal-Portland property northwest of Rosamond, McKenna et al. concurs with the overall conclusion that the general area is highly sensitive for the presence of prehistoric archaeological resources and moderately sensitive for the presence of historic archaeological resources. Prehistoric resources may be identified in the form of, but not limited to, the following:

[redacted]

[redacted]

Historic resources will likely be in the form of roads and/or mining claims, although late historic resources (isolates) may also be present. Modern refuse is expected, as the area is readily accessible for recreational purposes and previous reports of such refuse have been acknowledged.

## RESULTS OF THE RECENT SURVEY/TESTING PROGRAM

In conducting the recent investigations of the redefined Cal-Portland project area, consisting of the Area of Potential Impacts (mapped area and access road) and equated to approximately 30 +/- acres. Research into the area identified as Gem Hill concluded this area is outside the boundaries of the historic Burton Bros. Tropico Mine holdings and not directly associated with any previously recorded mining claim or operations. There are areas of mining to the north and south of this property (near Mojave/Tropico Road, but not associated with the current project area. The project area has been associated with historic era (ca. 1930s-1940s) recreational rock hunting and evidence of early use of the area may be identified. The area has also been associated with target shooting.

Based on previous research it is acknowledged this area was used by prehistoric and proto-historic Native American populations [redacted] Specifically, [redacted] was first reported in 1980, but with limited boundaries. Subsequently, in 2019, CRM Tech surveyed the adjacent property and redefined the boundaries to include a large area west of Mojave/Tropico Road, including the current 30 +/- acres, and consisting of a variety of resource types [redacted] In some portions of the larger site, these resources cluster, while in others, they are sparse or there are voids. Most of the identified resources associated with [redacted]

Given the redefined boundaries of the Cal-Portland project area, only three of the CRM Tech resources were identified within the APE and another two were nearby. Listed in Table 1 (page 4), these resources were mapped by CRM Tech (Figure 7). NOTE: the small triangle on the northern boundary of the APE is no longer part of the project area. The resources identified within this triangle was described as a fragment of [redacted] (orange). This area is no longer within any area of impacts.

McKenna et al. did identify some isolated flagging believed to be representative of the CRM Tech field markers. Whenever a flag was identified, efforts were made to correlate the locations with reported resources (and converting the CRM Tech NAD 83 coordinated to NAD 27 coordinates), with some success.

Within the area of direct impacts are two resources: [redacted] Rather than try to relocate these specific points, McKenna et al. resurveyed the whole area and, if the previously identified resources were relocated, they were assessed and recovered.

Illustrated in Figure 8, the resources identified by McKenna et al. including [redacted]

The modern refuse scatters identified within the APE consisted of from very modern deposition (Figure 9) to older, but still modern items (Figure 10). In each case, these resources were identified along existing roadways or near modern rock circles (hearths), representing refuse associated with the temporary use of the rings in the recent past. In one case, a modern soda can was still present within the rock circle, indicating very recent use of the area (Figure 11). While there was some evidence of older refuse, these areas were outside the APE.



Figure 7. The 2019 CRM Tech Map Illustrating Resource Locations in Relation to Redefined Project Area.

None of the refuse identified within the APE is significant and no further studies are necessary with respect to these modern resources.

Aside from the refuse, at least three roadways were identified within the APE – all dirt access roads and including one main access road off Mojave/Tropico Road and two laterals leading to the west/southwest. These roads are not illustrated on the 1943 or 1947 USGS quadrangles (see Figures 5 and 6).



Figure 8. Resources Identified by McKenna et al. (2019).

McKenna et al. has tentatively concluded these roads post-date 1947 and are not associated with any history use of the area, but more likely later historic or early modern periods (1950s-1960s). More heavily used roadways were mapped on the north side of the 190 acre Cal-Portland property, but these roads will not be impacted by the proposed project. The two lateral roads are more likely modern, as each is associated with the presence of modern rock circles and/or modern refuse – the roads established by the more recent use of the area. (Figure 12).

A review of the more recent USGS quadrangles showed these roadways, including the main access road, were not illustrated in 1964, but the main access road was established by 1976. These maps indicate the main access road is also a modern addition to the area and quite possibly established in association with the prior activities attributed to the Martin Trost & Associates proposed mining activities (see Schiffmand and Lewis 1980).



Figure 9. Modern Refuse along Main Access Road.



Figure 10. Broken Drawer (firewood) Identified near a Rock Circle.



Figure 11. Example of Rock Circle (Hearth) with Modern Pepsi Can and Recently Burned Wood.



Figure 12. Lateral Road with Evidence of Recent Tire Tracks (ESE).

Only the main access road crosses the APE and this alignment, determined to be a modern feature in the area, is not a significant cultural resource. It may be related to activities well outside the APE (e.g. further into the hills to the west/northwest), but in this particular area, it is not considered to be a resource requiring additional research or recording.

The recent survey by McKenna et al. relocated at least two locations reported by CRM Tech as being associated with chipping stations. In one instance, the identified resource was relocated and the presence of flakes was confirmed [redacted]



Figure 13. Rhyolite Biface.

A thorough survey of the immediate area surrounding these three pieces failed to yield any additional artifacts, though it is always possible some items were missed. The area is covered with unaltered rhyolite stones and cobbles, reinforcing the previously description of the area as part of a larger site and involving prehistoric quarrying activities. Similar artifacts have been identified throughout the mapped boundaries of [redacted], and beyond.

Although outside the APE, McKenna et al. notes that there is [redacted] A sampling of these tools was recovered by McKenna et al., but impacts to the locus were specifically limited, per professional policies, to avoid unnecessary impacts to resources that are otherwise outside areas of direct impact.

## RESULTS OF THE INVESTIGATIONS

The goals of this investigation were to: 1) complete the historic research for the project area; 2) review the previous research pertaining to the general area; 3) resurvey that portion of the initial 190 acre property (now approximately 30 acres) and test or recover the resources for recognition as significant; and, 4) prepare a report addressing the findings and may recommendations, as deem applicable and appropriate.

### Historic Research

The historic research confirmed the project area is outside the boundaries of any reported mining claims, but in an area historically known as Gem Hill. Although the property was

used historically for recreational purposes, there were no significant historic period resources identified within the APE.



Figure 14. An Example of Flakes and Tools within a Locus South of the Current APE.

There were three roadways identified within the general area and one that crossed the APE. Research confirmed these roads to be modern and of no historical significance.

McKenna et al. notes that the alignment of Mojave/Tropico Road is a historic roadway and can be identified as a dirt road in ca. 1915 and a paved roadway by 1943. The references to “Mojave” are related to the road being a primary access road from the Antelope Valley to the Mojave Desert region. The reference to “Tropico” is related to the association with the Tropico Mine, located just over two miles south of the APE. As a recognized historic road alignment, McKenna et al. has recorded this alignment on the appropriate California DPR-523 forms (Appendix F). The proposed project will require some impacts to that portion of the Mojave/Tropic Road in the immediate vicinity of the property access road alignment.

The dirt road alignment of the Mojave/Tropic Road has been obliterated by the widening and paving of the road by 1943. There is a dirt shoulder on this road, no curbing and no known buried infrastructure features. The required improvements will not be extensive or result in an adverse impact, regardless of the potential significance of the road.

At this time, McKenna et al. considered this road to be a locally significant cultural resource and, through design, adverse impacts can be avoided.

## Previous Research

A review of the previous research confirmed the presence of [redacted] and other resources within one mile. The area is generally sensitive for the presence of limited historic period uses, but highly sensitive for the presence of additional evidence of prehistoric archaeological resources. Native American consultation confirmed this finding, as the Serrano at San Manuel (Mauck 2018) noted the presence of a large site near Willow Springs. The APE, all of the Cal-Portland property (190+/- acres), Rosamond Hills, and all of Antelope Valley should be considered highly sensitive for prehistoric archaeological resources.

## Prehistoric Archaeological Resources

Only one prehistoric feature was identified within the APE – this feature consisting of three rhyolite flakes (one being a biface) in the center of the APE. McKenna et al. recovered these artifacts and concluded there is no subsurface component, given the shallow nature of the soil above the areas of exposed bedrock.

Despite the lack of identified prehistoric resources within the APE, the APE and surrounding area are all within the defined boundaries of [redacted] that likely extends outside the boundaries defined by CRM Tech (2019) and possibly extended to include other individual sites identified within a one mile radius of the APE. The area (including the APE) should be considered sensitive for additional evidence of prehistoric cultural resources.

[redacted]



Figure 15. Flakes Identified along the Access Road.

[redacted]

At this time, McKenna et al. has concluded there are no significant prehistoric cultural resources within the APE. Previously identified resources were either recovered or determined not be non-artifactual. The sole resource identified within the APE has been recovered, yielding no evidence of buried deposits. The proposed project will not impact any identified significant resources, while still identified as being within a larger site boundary.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented above, McKenna et al. has found the current boundaries for [redacted] to be justified, acknowledging these boundaries are likely to change with additional studies surrounding the Cal-Portland property. Within [redacted] The APE associated with the current Cal-Portland undertaking is one of the area with a void in resources.

Only one prehistoric resources [redacted] was identified in the APE and this resource was tested and recovered. This resource (locus) is as significant as others within the site boundaries, but part of the greater whole.

The recovery of this loci artifacts has resulted in the clearing of the APE with respect to prehistoric resources, while acknowledging there is always a potential to identified additional components of [redacted] which, based on its identified loci, diversity of features, etc., should be considered significant and worthy of recognition as eligible for listing in the National Register of Historic Resources and the California Register of Historical Resources. It would also qualify as a locally significant cultural resource.

Because [redacted], without fully being evaluation, should be considered a potentially significant prehistoric cultural resource, McKenna et al. is recommended a limited archaeological monitoring program to insure any previously unidentified cultural resources within the APE are addressed in accordance with current professional standards. The monitoring program should include:

1. The presence of a **full-time** archaeological monitor at the intersection of Mojave/Tropico Road (during road construction) to insure any evidence of the historic road alignment that may be identified is adequately documented and recorded;

2. The presence of an archaeological monitor on a **part-time** basis during initial road development, facilities development, and shallow surface disturbances within the APE. The extent of the monitoring can be defined upon the completion of the task schedule. Monitoring of deeper subsurface excavations need not be monitored if the subsurface deposits are determined to be bedrock and not associated with soils or artifact-bearing deposits;

3. The monitoring program should be flexible and, if necessary, extended to a **full-time** program, should potentially significant resources be identified on a level that cannot be managed during the monitoring program;

4. At the completion of the monitoring program, a technical document detailing the methodology and findings must be prepared, including the photo-documentation and inventory of any items recovered as a result of the monitoring;

5. If, at any time, evidence of human remains (or suspected human remains) is identified, the County Coroner must be notified immediately and permitted to inspect the find i*n situ* and make a determination. If the remains are human, the Coroner will determine whether they are archaeological or forensic and, if deemed archaeological, will notify the Native American Heritage Commission. The Commission will identified the "Most Likely Descendent" (MLD) and, in consultation with the property owner and Lead Agency, will determine the disposition of the remains. All costs would be borne by the property owner.

**McKenna et al. emphasizes this report addresses only a portion of the larger 190 acre Cal-Portland property and its current proposed 30 acre undertaking. If future plans extend outside the boundaries of the current APE, additional research must be undertaken.**

CERTIFICATION

I hereby certified that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: June 26, 2019 Signed: Jeanette A. McKenna

Jeanette A. McKenna, Principal Investigator

# REFERENCES


Ancestry.com
2019 "H. Clifford Burton." www.ancestry.com.au/boards/localities.

Anderson, M. Kat
2005 Tending the Wild: Native American Knowledge and the Management of California's Natural Resources. University of California Press, Berkeley.

Apostolides, A.
1965 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Blackburn, Thomas C. and Lowell John Bean
1978 "*Kitanemuk*." In: Handbook of North American Indians, Volume 8: California; edited by R.F. Heizer. pp. 564-569. Smithsonian Institution, Washington, D.C.

Brock, James and Katherine D. Davidson
1992 Cultural Resources Assessment of Section 31, Township 10 North, Range 12 West, Rosamond Hills Area of Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1992 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

California Native Plant Society (CNPS)
2019 A Manual of California Vegetation. Sacramento, California. www.cnps.org.

CaliSphere
1963 "Burton's Tropico Mine." Kern County Library, Beale Memorial Library. On file, McKenna et al., Whittier, California.

Darling, Curtis
1988 Kern County Place Names. Kern County Historical Society. Pioneer Publishing Company, Fresno, California.

Find-A-Grave
2019 "Horace Clifford Burton." www.findagrave.com/memorial.

Gold Ledge
2006 "Antelope Valley mines, Kern County, California, 1983." *Gold Ledge*, Volume II, Issue 1. Axiom. http://goldledge.com/photos/docs.

Hamilton, Eva, E. Beery, O. Bukley, C. McDougal, F. Rector, M. Thomason, et al.
1913 "The Heart of Antelope Valley." Antelope Valley Union High School, Lancaster. (Reprinted 1963)

Hammond, Jon
2017 "Night Sightings: Uncommon but Still Persisting." *Tehachapi News*, April 10, 2017. www.tehachapinews.com.

Hilu, Khidir W., Steve Boyd, and Peter Felker
1982 "Morphological Diversity and Taxonomy of California Mesquites *(Propoxis Leguminosae*)." *Madroño* 29(4):237-254.

Hogan, Michael, Bai Tom Tang, Deirdre Encarnaciòn, and Nina Gallardo
2019 Phase I Historical/Archaeological Resources Survey: Rosamond Hills Mine Project – Assessor's Parcel Nos. 0345-294-17; 0345-031-02, and 0345-032-02, -05, and -31, Rosamond Area, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Kern-Antelope Valley Historical Society, Inc.
1967 "Along the Rails from Lancaster to Mojave." On file, Kern County Public Library, Rosamond, Kern County, California.

Kern County Historical Society, Inc.
1984 "Burton Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

1984 "Settle Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

Larson, Kenneth A.
n.d. "Tropico Mine." www.placesearth.com.

Lewis, C.
1980 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Lewis, W. Scott
1972 "Gem Collecting in California." *Hobbies* 47:116-117.

Loop Newspaper (The)
2016 "Rosamond History." Hilltop Publishers, Tehachapi, California. www.the loopnewspaper.com.

Mauck, Jessica
2018 NA Scoping Letter for the Proposed Rosamond Hills Mine Project: Portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02, -05, and -31; 189 Acres in the Rosamond Hills Area, Kern County. On file, McKenna et al., Whittier, California.

McKenna, Jeanette A.
1987 Determination of Eligibility Report and Mitigation Recommendations for the Gladding, McBean & Co. Tropico/Glendale Facility Franciscan Mfg. Plant, Glendale, Los Angeles County, California.

1988 Architectural Investigations of the Franciscan Ceramic Plant, Glendale, CA. (w/R.G. Hatheway)

1990 "The Franciscan Ceramics Plant of Glendale, California: Makers Marks and Production Data." Paper presented at the *Annual Meeting of the Society for Historical Archaeology*, Tucson, Arizona.

Menke, J., E. Reyes, A., Glass, D. Johnson, and J. Reyes
2013 "California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan." California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission, Sacramento, California. On file, Aerial Information Systems, Redlands, California.

MinDat
2019 "Guide to the Rock and Minerals of Minecraft: Tropico Hill, Mojave-Rosamond District (Mojave District), Kern Co., California, USA." www.mindat.org.

2019 "Gem Hill." Gem Hill, Rosamond Hills, Rosamond, Mojave-Rosamond Mining District (Mojave District), Kern County, California. www.mindat.org.

Munz, Philip and David D. Keck
1959 A California Flora. University of California Press, Berkeley, California.

Murdoch, Joseph and Robert W. Webb
1966 "Minerals of California, Centennial Volume (1866-1966)." *California Division of Mines and Geology Bulletin* 189:317.

Norwood, Richard H.
1989 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

NETR
2019 Historic Aerials 1972-2014. www.historicaerials.com.

Orme, Antony R.
2004 "Lake Thomspon, Mojave Desert, California: A Desiccating Late Quaternary Lake System." US Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, Mississippi.

Osborne, Richard H., L. Wear, A. Ahif, and S. Harris
1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E.
1990 Archaeological Assessment of Tentative Tract No. 5182, Rosamond Hills, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E. and Richard Osborne
1990 Isolate Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Pemberton, H. Earl
1983 Minerals of California. Van Nostrand Reinholdt Press, New York.

Pruett, Catherine Lewis
1990 An Archaeological Assessment of 20 Acres of Land Northwest of Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Rahder, Jonathan Burton
2019 Personal Communication.

Rahder, Keith
2019 Personal Communication.

San Joaquin Valley Library System Digital Collection
2019 "Burton's Tropico Mine." digital.sjvis.org. On file, McKenna et al., Whittier, California.

Scharlotta, Ian
2014 "Trade Routes and Contradictory Spheres of Influence: Movement of Rhyolite through the Heart of the Western Mojave Desert." *California Archaeology* 6(2):219-246.

Schiffman, Robert A.
1989 Archaeological Investigation for Parcel Map No. 9166, Kern County, Califon-ria. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Schiffman, Robert A. and Catherine Lewis
1980 Archaeological Report for Prospecting Permit – Martin Trost & Associates. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serfoss, Wes
1972 Site Record Form: [redacted]. On file, California State University, Bakers-field, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serpico, Phil
2000 Railroading through the Antelope Valley. Omni Publications, Palmdlae, Cal-ifornia.

Settle, Glen A.
1967 "Rosamond and its Mining History." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 63-65.

Settle, Glen A.
1975 "The Antelope Left and the Settlers Came." J*ournal of the Kern-Antelope Historical Society, Inc.*, Rosamond, California.

Settle, Glen A. (ed.)
1963 "Here Roamed the Antelope." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 19-41.

Sheppard, R.A. and A.J. Gude
1964 "Reconnaissance of Zeolite Deposits in Tuffaceous Rocks of the Western Mojave Desert and Vicinity, California." *California Division of Mines and Geology Bulletin* 189:317. Sacramento, California.

Sutton, Mark Q.
1980 "Some Aspects of Kitanemuk Prehistory." *Journal of California and Great Basin Anthropology* 2(2):214-225.

Sutton, Mark Q., R.W. Robinson, and Jill K. Gardner
2009 "Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California." *Pacific Coast Archaeological Society Quarterly* 42(2-3):17-90.

Tipton, Karla
1983 "There's Gold in Them Thar Hills! The Story of Antelope Valley Gold." Antelope Valley Newspapers, February 24, 1983. On file, McKenna et al., Whittier, California.

Troxel, Bennie Wyatt and P.K. Morton
1962 "Mines and Mineral Resources of Kern County, California." *California Division of Mines and Geology: County Report No. 1* (370:91-92). Sacramento, California.

Tucker, W. Burling
1935 "Mining Activity at Soledad Mountain and Middle Buttes, Mohave Mining District, Kern County, California." *California Journal of Mines and Geology* 29:330-331. California Mining Bureau, Sacramento, California.

Tucker, W. Burling and Reid J. Sampson
1933 "Gold Resources of Kern County, California." *California Journal of Mines and Geology 31:482-483*. California Mining Bureau, Sacramento, California.

1940 "Current Mining Activity in Southern California. *California Journal of Mines and Geology 36(1):37*. California Mining Bureau, Sacramento, California.

Tucker, W. Burling, Reid J. Sampson, and Gordon Blaisdell Oakeshott

1949 "Mineral Resources of Kern County, California." *California Journal of Mines and Geology 45(2):234-235*. California Mining Bureau, Sacramento, California.

United States Department of the Interior

1856 Plat Map: Township 9 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 9 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1917 Elizabeth Lake Quadrangle (30'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1943 Rosamond Quadrangle (15'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1947 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1962 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1971 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1973 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1975 Los Angeles, California (1:250,000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

United States Department of the Interior
2019 "Tropico Mines." Mineral Resources Data System. mrdata.usgs.gov/mrds. On file, McKenna et al., Whittier, California.

Warren, Claude N.
1984 "The Desert Region." In: California Archaeology, ed. by M.J. Moratto. Academic Press, Orlando, Florida. pp. 339-430.

Warren, Claude N. and Robert H. Crabtree
1986 "Prehistory of the Southwestern Area." In: Handbook of North American Indians, Volume 11: Great Basin. Smithsonian Institution, Washington, D.C. pp. 183-193.

West Antelope Valley Historical Society
n.d. "Rosamond, California 93560. www.rosamondca.us.

Yohe, Robert M.
1991 An Archaeological Assessment of Approximately 350 Acres of Land in Hidden alley near Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

# APPENDIX A:

Professional Qualifications

# JEANETTE A. McKENNA

**Owner and Principal Investigator**
**McKenna et al., Whittier CA**

Ms. McKenna specializes in the discipline of Cultural Resource Management: prehistoric archaeology, historic archaeology, historic architecture, and history. She holds a Master's Degree in Anthropology/Archaeology and was recently awarded an Honorary Doctorate of Letters (HonDL) by the International Biographical Centre of Cambridge, England. She is a past member of the Board of Directors for the Society of Professional Archaeologists (SOPA 1993-97) and was certified by the Society to conduct both prehistoric and historic archaeological studies. Ms. McKenna is also recognized by the California Office of Historic Preservation as qualified to complete historic architectural studies. Ms. McKenna was on the Board of Directors for SOPA when the Society established the Registry of Professional Archaeologists (RPA) and has been a Registered Professional Archaeologist since 1998. Ms. McKenna has over 39 years of professional experience as an archaeologist/cultural resource manager and has participated on over 1700 projects of various sizes and complexities. The majority of her work has been conducted as a Field Director, Project Manager, and/or Principal Investigator throughout California and the Greater Southwest.

## TECHNICAL CAPABILITIES

- Vast experience in the greater Southwest, Great Basin, and Southern California regions. Familiar with the full range of cultural resource investigations and has completed projects within the public and private sectors, including environmental management firms, planning and engineering firms, and State and federal agencies.
- Active in the discipline of Cultural Resource Management since 1976; over 39 years of professional experience in Southern California, Arizona, and Nevada.
- Particular interest in the desert regions of California and Arizona, with specializations in the Protohistoric and Historic Contact Periods.
- Considerable experience in dealing with prehistoric cultural remains and working directly with Native American groups in archaeological training programs (Arizona State University; the Southern California Indian Center, Garden Grove).

## EDUCATION AND AFFILIATIONS

B.A., Anthropology, 1977, CSU Fullerton
M.A., Anthropology, 1982, CSU Fullerton
HonDL, 2015, Int. Biog. Centre, Cambridge
Lambda Alpha Lambda Honors Society
Post Graduate Studies, Arizona St. Univ., 1982-85
Post Graduate Studies, UC Riverside, 1991-92
Certification Program: CEQA, Land Use and Environmental Planning, UC Riverside, 1997-98
Society of Professional Archaeologists (SOPA)
Certification: Field/ Prehistoric Archaeology and Historical Archaeology (1984 to Present)
Registry of Professional Archaeologists (RPA)
Board of Directors, Society of Professional Archaeologists 1993-1997 (American Society of Conservation Archaeologists Representative)
BLM California Permit (renewable)
BLM Arizona State Permit (renewable)
Riverside County Registration No. 161
Arizona State Antiquities Permit (renewable)
Curation, San Bernardino Co. Museum
Curation, Arizona State University

## SELECTED PROJECT EXPERIENCE

- Historic Architectural Studies for Renovation and Restoration, the Greek Theatre, Los Angeles CA
- Evaluation of Cultural Resources: Burbank and West Hollywood Redevelopment Project Areas, Los Angeles County, CA
- Historic Property Survey for the City of Whittier, Los Angeles County, CA
- Archaeological Investigations and Resource Evaluations for the Proposed Cajon Pipeline, San Bernardino and Los Angeles Counties, CA
- Archaeological Class I Investigations, Proposed Mojave Pipeline, San Bernardino County, CA
- Cultural Resources Investigations (Phases I, II, III, and Mitigation Monitoring) for the RIX/SARI Projects, Santa Ana Watershed Project Authority (SAWPA), San Bernardino and Riverside Counties, CA
- Phase I, II, and III Archaeological Investigations for the County Sanitation Districts of Los Angeles County, Puente Hills Landfill Solid Waste Management Facility Expansion Project, Whittier, CA
- Archaeological Mitigation Program, Phoenix Indian School Track Site Project. Arizona State University Office of Cultural Resource Management and the Bureau of Indian Affairs, Phoenix, AZ
- Archaeological and Testing Program for the Hidden Valley Golf Course and Van Buren Golf Course Properties, Riverside County, CA
- Cultural Resources Overview Studies for the Annexation of Unincorporated County Lands to the City of Ontario, CA
- Historic Property Survey Reports: Warner Bros. Main Lot Ranch Lot Properties, Burbank, CA
- Historic Archaeological Investigations for L.A. County Sheriff's Facility, Lancaster, CA.

# APPENDIX B:

Archaeological Records Search

**THIS APPENDIX CONTAINED CONFIDENTIAL AND PROPRIETORY DATA - NOT FOR PUBLIC REVIEW**
**(Filed Separately)**

# APPENDIX C:

Native American Consultation

# McKenna et al.

History/Archaeology/Architectural History/Ethnography/Paleontology

Jeanette A. McKenna, MA
Reg. Professional Archaeologist
Owner and Principal Investigator

## SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, California 95691
(916) 373-3710 (916) 373-5471 FAX or (916) 657-5390 FAX
nahc@nahc.ca.gov

*Information Below is Required for a Sacred Lands File Search*

Date: **April 26, 2019**

Project: **Rosamond Hills Mine Project**

County: **Kern**

USGS Quadrangle: **Soladad Mountain (rev. 1973)**

Township: **10 N** Range: **13 W** p/o Section(s): **25, 26, 35, and 36**

Company/Firm/Agency: **McKenna et al.**
Contact Person: **Jeanette A. McKenna**
Street Address: **6008 Friends Avenue**
City: **Whittier, CA** Zip: **90601-3724**

Phone: **(562) 696-3852**

Cell: **(562) 754-7712**

Email: **jeanette.mckennaetal@gmail.com**

Project Description: **Approximately 190 Acres of Cal-Portland Mining Claim**

**NATIVE AMERICAN HERITAGE COMMISSION**
**Cultural and Environmental Department**
**1550 Harbor Blvd., Suite 100**
**West Sacramento, CA 95691**
**Phone: (916) 373-3710**
**Email: nahc@nahc.ca.gov**
**Website: http://www.nahc.ca.gov**
**Twitter: @CA_NAHC**

May 28, 2019

Jeanette McKenna
McKenna et al.

VIA Email to: Jeanette.mckennaetal@gmail.com.

RE: Rosamund Hills Mine Project, Kern County

Dear Ms. McKenna:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: Katy.sanchez@nahc.ca.gov.

Sincerely,

Katy Sanchez

KATY SANCHEZ
Associate Environmental Planner

Attachment

# APPENDIX D:

Photographic Record

State of California
DEPARTMENT OF PARKS AND RECREATION

# PHOTOGRAPHIC RECORD

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Gem Hill Mine, Rosamond, Kern Co., CA
Camera Format: Digital Year 2019
Film Type and Speed: NA Lens Size: NA Negatives Kept At: McKenna et al., Whittier CA

| Month | Day | Time | Frame | Description (with NAD 27 Readings) | View | Acc. # |
|---|---|---|---|---|---|---|
| 5 | 30 | PM | 1 | Overview from Road @ 388879E/3864547N | N | |
| 5 | 30 | PM | 2 | Overview from Road @ 388879E/3864547N | NE | |
| 5 | 30 | PM | 3 | Overview from Road @ 388879E/3864547N | E | |
| 5 | 30 | PM | 4 | Overview from Road @ 388879E/3864547N | SE | |
| 5 | 30 | PM | 5 | Overview from Road @ 388879E/3864547N | S | |
| 5 | 30 | PM | 6 | Overview from Road @ 388879E/3864547N | SW | |
| 5 | 30 | PM | 7 | Overview from Road @ 388879E/3864547N | W | |
| 5 | 30 | PM | 8 | Overview from Road @ 388879E/3864547N | NW | |
| 5 | 30 | PM | 9 | Fallen Stake @ 388857E/3864499N | N | |
| 5 | 30 | PM | 10 | Fallen Stake @ 388857E/3864499N | N | |
| 5 | 30 | PM | 11 | Drainage Identified @ 388862E/3864523N | W | |
| 5 | 30 | PM | 12 | Drainage Identified @ 388862E/3864523N | E | |
| 5 | 30 | PM | 13 | Isolated Sanitary Can @ 388822E/3864423N | N | |
| 5 | 30 | PM | 14 | Slope at CRMTech UTMs @ 388779E/3864357 | W | |
| 5 | 30 | PM | 15 | Slope at CRMTech UTMs @ 388815E/3864309 | W | |
| 5 | 30 | PM | 16 | Surface @ 388778E/3864375N | S | |
| 5 | 30 | PM | 17 | Old Road @ 388647E/3864715N | SSW | |
| 5 | 30 | PM | 18 | Intersection of Main Access Road and Old Road @ 388660E/3864741N | WNW | |

State of California
DEPARTMENT OF PARKS AND RECREATION

# PHOTOGRAPHIC RECORD

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Gem Hill Mine, Rosamond, Kern Co., CA
Camera Format: Digital Year 2019
Film Type and Speed: NA Lens Size: NA Negatives Kept At: McKenna et al., Whittier CA

| Month | Day | Time | Frame | Description (with NAD 27 Readings) | View | Acc. # |
|---|---|---|---|---|---|---|
| 5 | 30 | PM | 19 | Intersection of Main Access Road and Old Road @ 388660E/3864741N | ESE | |
| 5 | 30 | PM | 20 | Overview of Project Area from 388879E/3864547N | SE | |
| 5 | 31 | AM | 21 | Road @ 388815e/3864633 | N | |
| 5 | 31 | AM | 22 | Flake on Road @388805E/3864646N | S | |
| 5 | 31 | AM | 23 | Flake on Road @388805E/3864646N (with bag) | Detail | |
| 5 | 31 | AM | 24 | Rock Ring (Modern Hearth @ 388782E/3864680N | SSW | |
| 5 | 31 | AM | 25 | Flake/Burin on Road @ 388727E/3864705N | S | |
| 5 | 31 | AM | 26 | Flake/Burin on Road @ 388727E/3864705N (with bag) | Detail | |
| 5 | 31 | AM | 27 | Concrete Marker “EJH 201” | NE | |
| 5 | 31 | AM | 28 | Concrete Marker “EJH 201” | NE | |
| 5 | 31 | AM | 29 | Flagging and Flakes @ 388745E/3864417N | NE | |
| 5 | 31 | AM | 30 | Flagging and Flakes @ 388745E/3864417N (with bag) | NE | |
| 5 | 31 | AM | 31 | Biface/Core @ 388799E/3864773N | NE | |
| 5 | 31 | AM | 32 | Biface/Core/Flakes @ 388799E/3864773N (with bag) | NE | |
| 5 | 31 | AM | 33 | Flagging and Poss. Metate Frag. @ 388774E/3864445N | NE | |
| 5 | 31 | AM | 34 | Possible Hearth @ 388771E/3864443N (near artifacts) | E | |
| 5 | 31 | AM | 35 | Flagging and Poss. Metate Frag. @ 388785E/3864459N | NE | |
| 5 | 31 | AM | 36 | Possible Metate Frag. @ 388785E/3864459N | NE | |

State of California
DEPARTMENT OF PARKS AND RECREATION

# PHOTOGRAPHIC RECORD

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Gem Hill Mine, Rosamond, Kern Co., CA
Camera Format: Digital Year 2019
Film Type and Speed: NA Lens Size: NA Negatives Kept At: McKenna et al., Whittier CA

| Month | Day | Time | Frame | Description (with NAD 27 Readings) | View | Acc. # |
|---|---|---|---|---|---|---|
| 5 | 31 | AM | 37 | Overview on Road @ 388656E/3864715N | E | |
| 5 | 31 | AM | 38 | Overview on Road @ 388656E/3864715N | W | |
| 5 | 31 | AM | 39 | Refuse South of Road @ 388656E/3864715N | E | |
| 5 | 31 | AM | 40 | Modern Hearth @ 388638E/3864706N | S | |
| 5 | 31 | PM | 41 | Flake on Road @ 388574E/3864734N | S | |
| 5 | 31 | PM | 42 | Flake on Road @ 388574E/3864734N (with bag) | S | |
| 5 | 31 | PM | 43 | Drainage @ 388576E/3864681N | SW | |
| 5 | 31 | PM | 44 | Overview @ 388569E/3864277N | N | |
| 5 | 31 | PM | 45 | Flakes @ 388564E/3864274N (CRM Tech Locale?) | Detail | |
| 5 | 31 | PM | 46 | Overview Photos from 388564E/3864274N | E | |
| 5 | 31 | PM | 47 | Overview Photos from 388564E/3864274N | N | |
| 5 | 31 | PM | 48 | Overview Photos from 388564E/3864274N | W | |
| 5 | 31 | PM | 49 | Survey Marker @ 388586E/3864301N | N | |
| 5 | 31 | PM | 50 | Overview Photos from 388700E/3864509N | N | |
| 5 | 31 | PM | 51 | Overview Photos from 388700E/3864509N | E | |
| 5 | 31 | PM | 52 | Overview Photos from 388700E/3864509N | S | |
| 5 | 31 | PM | 53 | Overview Photos from 388700E/3864509N | W | |
| 5 | 31 | PM | 54 | Isolated Flap Seam Can @ 388719E/3864540N | Detail | |

State of California
DEPARTMENT OF PARKS AND RECREATION

# PHOTOGRAPHIC RECORD

Primary #
HRI #
Trinomial

**Page 4 of 4** ***Resource Name or # (assigned by recorder) Gem Hill Mine, Rosamond, Kern Co., CA**
**Camera Format: Digital** **Year 2019**
**Film Type and Speed: NA** **Lens Size: NA** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description (with NAD 27 Readings) | View | Acc. # |
|---|---|---|---|---|---|---|
| 5 | 31 | PM | 55 | Large Drainage @ 388730E/3864552N | E | |
| 5 | 31 | PM | 56 | Flakes @ 388734E/3864582N | NE | |
| 5 | 31 | PM | 57 | Flakes @ 388734E/3864582N (with bag) | Detail | |
| 5 | 31 | PM | 58 | Possibly Pecked Rocks @ 388751E/3864600N | S | |
| 5 | 31 | PM | 59 | Flagging and Poss. Ground Stone @ 388777E/3864598N | S | |
| 5 | 31 | PM | 60 | Flagging and Poss. Ground Stone @ 388777E/3864598N | S | |
| 5 | 31 | PM | 61 | Wood Debris in Drainage @ 388792E/3864618N | NE | |
| 5 | 31 | PM | 62 | Wood Debris in Drainage @ 388792E/3864618N | S | |
| 5 | 31 | PM | 63 | Wood Debris in Drainage @ 388792E/3864618N | SW | |
| 5 | 31 | PM | 64 | Access Road @ 38886E/3864538N | E | |
| 5 | 31 | PM | 65 | Modern Refuse on Road @ 388963E/3864523N | E | |
| 5 | 31 | PM | 66 | Access Road @ 389916E/3864529N | SE | |
| 5 | 31 | PM | 67 | Access Road @ 389057E/3854474N | ESE | |
| 5 | 31 | PM | 68 | Access Road @ 389129E/3864379N | E | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# APPENDIX E:

Supplemental Research Data

# GRADING PLAN

## CAL PORTLAND COMPANY
## TROPICO ROAD ROSAMOND HILL PROPERTY
## PARCEL NO. 345-032-31
## ROSAMOND, CALIFORNIA
## PERMIT #: K201806271

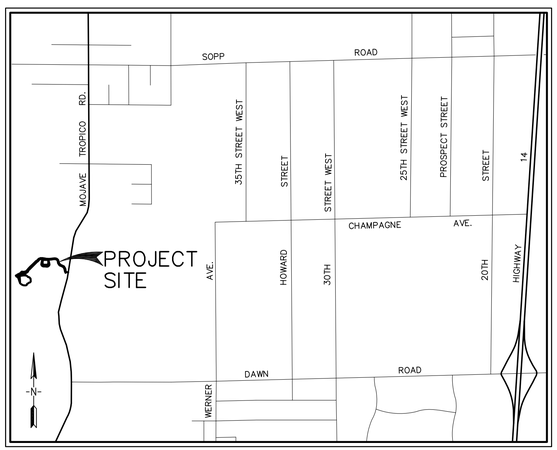
ALL CONSTRUCTION ACTIVITY, INCLUDING STAGING, SHALL BE WITHIN THE LIMITS SHOWN ON THIS PLAN. CONTRACTOR SHALL OBTAIN A COPY OF THE BIOLOGICAL CLEARANCE SURVEY FOR THIS PROJECT. CONTRACTOR SHALL BE SOLELY LIABLE AND RESPONSIBLE FOR FOLLOWING THE RECOMMENDATIONS OF THE BIOLOGICAL CLEARANCE SURVEY. NO STAGING, GRADING, OR OTHER DISTURBANCE SHALL OCCUR OUTSIDE THE LIMITS SHOWN ON THIS PLAN.

**DATUM:**
USGS NAVD88
CONTROL IS ESTABLISHED BY CAL PORTLAND USING A PERMANENT BASE STATION.

**LEGAL DESCRIPTION**
EAST HALF OF THE NORTHWEST QUARTER OF SECTION 36,
TOWNSHIP 10 NORTH, RANGE 13 WEST, PARCEL No. 345-032-02.

**NOTE:**

1. IF THE PROJECT IS SUBJECT TO THE PROVISIONS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES), A "NOTICE OF INTENT" (NOI) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY (SWRCB ORDER NO. 2009-009-DWQ AS AMENDED BY ORDER 2010-0014-DWQ AND ORDER 2012-0006-DWQ) MUST BE FILED WITH STATE WATER RESOURCES CONTROL BOARD IN SACRAMENTO BEFORE THE BEGINNING OF ANY CONSTRUCTION ACTIVITY. COMPLIANCE WITH THE GENERAL PERMIT REQUIRES THAT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) BE PREPARED, CONTINUOUSLY CARRIED OUT, AND ALWAYS BE AVAILABLE FOR PUBLIC INSPECTION DURING NORMAL CONSTRUCTION HOURS. WASTE DISCHARGE IDENTIFICATION (WDID) NUMBER 6B15C384488 HAS BEEN ISSUED BY THE STATE WATER RESOURCES BOARD FOR THIS PROJECT.
2. TOPOGRAPHICAL SURVEY WAS PROVIDED BY CAL PORTLAND. ENGINEER MAKES NO WARRANTS TO ACCURACY OF EXISTING TOPOGRAPHY.




VICINITY MAP
NO SCALE

**GRADING QUANTITIES**

THE QUANTITIES SHOWN BELOW ARE FOR GRADING PERMIT PURPOSES ONLY, AND SHALL NOT BE USED FOR BIDDING PURPOSES. THE CONTRACTOR SHALL MAKE HIS/HER OWN ESTIMATE OF QUANTITIES FOR BIDDING THIS PROJECT.

| | |
|---|---|
| CUT | 49,952 CY ± |
| FILL | 15,559 CY ± |
| EXPORT | 34,393 CY ± |
| ON-SITE GRADING AREA | 16.2 GROSS ACRES |

*FILL QUANTITIES ARE "COMPACTED IN-PLACE" VOLUMES.

UNDERGROUND SERVICE ALERT
OF SOUTHERN CALIFORNIA

DIAL TOLL FREE 1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG

**ABBREVIATIONS**
TYPICAL ALL SHEETS UNLESS SUPERSEDED BY SHEET DEFINITION

| | |
|---|---|
| EX | EXISTING |
| FUT | FUTURE |
| FG | FINISHED GROUND |
| FS | FINISHED SURFACE |
| FP | FINISHED PAD |
| FF | FINISHED FLOOR |
| NG or OG | NATURAL/ORIGINAL GROUND |
| EP | EDGE OF ASPHALT CONCRETE PAVEMENT |
| AC | TOP OF ASPHALT CONCRETE PAVEMENT |
| AB | AGGREGATE BASE |
| ASB | AGGREGATE SUB-BASE |
| CL | CENTERLINE |
| DWY or D/A | DRIVEWAY OR DRIVE APPROACH |
| FL | FLOWLINE |
| GB | GRADE BREAK |
| TOG | TOP OF GRATE/CATCH BASIN INLET |
| TOC | TOP OF CONCRETE |
| CONC | CONCRETE |
| BW | BACK OF SIDEWALK |
| TC | TOP OF CURB |
| BCR | BEGIN CURB RETURN |
| ECR | END CURB RETURN |
| PI | POINT OF INTERSECTION |
| EC | END CURVE |
| BC | BEGIN CURVE |
| PIVC | VERTICAL CURVE POINT OF INTERSECTION |
| POVC | POINT ON VERTICAL CURVE |
| VC | VERTICAL CURVE |
| BVC | BEGIN VERTICAL CURVE |
| EVC | END VERTICAL CURVE |
| PRC | POINT OF REVERSE CURVE |
| PCC | POINT OF COMPOUND CURVE |
| ~ | ON THIS SHEET |
| MAX | MAXIMUM |
| MIN | MINIMUM |
| TYP | TYPICAL |
| EL or ELEV | ELEVATION |
| BDRY | BOUNDARY |
| R | RADIUS |
| L | LENGTH |
| AF | ACRE-FEET |
| SF | SQUARE FEET |
| LF | LINEAR FEET |
| EA | EACH |
| CY | CUBIC YARDS |
| ESMT | EASEMENT |
| RW | RIGHT-OF-WAY |
| SD | STORM DRAIN |
| CB | CATCH BASIN |
| SWR | SANITARY SEWER |
| MH | MANHOLE |
| WTR | WTR |
| G | GAS |
| REQ'D | REQUIRED |

THE ABOVE DRAWINGS AND SPECIFICATIONS, AND IDEAS, DESIGNS, AND ARRANGEMENTS REPRESENTED THEREBY, ARE AND SHALL REMAIN THE PROPERTY OF THE ENGINEER; NO PART THEREOF SHALL BE COPIED, DISCLOSED TO OTHERS, OR USED IN CONNECTION WITH ANY WORK OR PROJECT OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY HAVE BEEN PREPARED AND DEVELOPED WITHOUT THE WRITTEN CONSENT OF THE ENGINEER. VISUAL CONTACT WITH THESE DRAWINGS OR SPECIFICATIONS SHALL CONSTITUTE CONCLUSIVE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THIS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS. SHOP DETAILS MUST BE SUBMITTED TO THIS OFFICE FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION.

PORTER & ASSOCIATES, INC.
ENGINEERING & SURVEYING
1200 21st Street, Bakersfield, California 93301
661.327.0362 FAX 661.327.1065

PRELIMINARY - NOT FOR CONSTRUCTION

FRED W. PORTER
PROJECT ENGINEER: FWP
DRAFTSMEN: NMS
PA REVIEW BY: DATE:

REGISTERED PROFESSIONAL ENGINEER * FRED W. PORTER * RCE 33448 * STATE OF CALIFORNIA * CIVIL

GRADING PLAN
CAL PORTLAND COMPANY
ROSAMOND, HILL PROPERTY
TITLE SHEET

REVISIONS

DATE 03/29/2019
PA JOB No. 3106

SHEET 1 OF 000 SHEETS

J:\3106\Improvement\3106-GR_C3D.dwg 03/29/19 matthewcarson

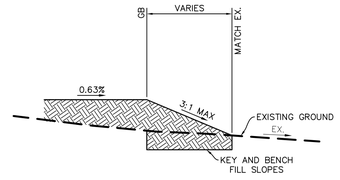
## COUNTY OF KERN GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THIS PLAN, CALIFORNIA BUILDING CODE, LATEST EDITION AND STANDARDS PERTAINING THERETO. THESE DOCUMENTS SHALL BE MADE A PART HEREOF.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS BEFORE START OF CONSTRUCTION.
3. PRIOR TO THE START OF ANY PHASE OF CONSTRUCTION WITHIN THE STREET RIGHT-OF-WAY, THE CONTRACTOR SHALL GIVE THE COUNTY CONSTRUCTION INSPECTION DEPARTMENT 48 HOURS NOTICE.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING DIMENSIONS, DATA AND MEASUREMENTS AT THE BUILDING SITE PRIOR TO CONSTRUCTION. DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. PORTER & ASSOCIATES, INC. MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS.
5. EXISTING UTILITY AND UNDERGROUND LINES HAVE BEEN SHOWN ON THIS PLAN IN AN APPROXIMATE WAY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND DEPTH OF ALL EXISTING UTILITIES AND UNDERGROUND PIPELINES BEFORE COMMENCING WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR BY HIS FAILURE TO EXACTLY LOCATE, PRESERVE AND PROTECT ANY AND ALL UNDERGROUND UTILITIES AND PIPELINES. THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT (U.S.A.: 1-800-227-2600) TWO WORKING DAYS PRIOR TO ANY CONSTRUCTION OR EXCAVATION.
6. ANY EXISTING IMPROVEMENTS OR UTILITIES THAT ARE REMOVED, DAMAGED OR UNDERCUT BY CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE, AS DIRECTED BY THE ENGINEER AND APPROVED BY THE GOVERNING AUTHORITY.
7. IF A PROBLEM OR CONFLICT SHOULD ARISE DURING THE COURSE OF THE PROJECT, IT IS THE RESPONSIBILITY OF THE OWNER OR GRADING CONTRACTOR TO NOTIFY THE ENGINEER IMMEDIATELY PRIOR TO ANY FURTHER WORK.
8. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND SUPERVISION NECESSARY FOR A COMPLETE AND FUNCTIONAL PRODUCT.
9. ALL WORK WHICH IS DEFECTIVE IN ITS CONSTRUCTION OR DEFICIENT IN ANY OF THE REQUIREMENTS OF THESE DRAWINGS AND SPECIFICATIONS SHALL BE REMEDIED, OR REMOVED AND REPLACED BY THE CONTRACTOR IN AN ACCEPTABLE MANNER, AND NO COMPENSATION WILL BE ALLOWED FOR SUCH CORRECTION.
10. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT; INCLUDING EROSION, SEDIMENTATION & DUST CONTROL PLAN AND STORM WATER POLLUTION PREVENTION PLAN IMPLEMENTATION AND THE SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
11. IF THE CONTRACTOR IS IN DOUBT AS TO THE MEANING OF ANY PART OF THE DRAWINGS AND SPECIFICATIONS OR FINDS DISCREPANCIES IN OR OMISSIONS FROM THE DRAWINGS, HE SHALL SUBMIT A WRITTEN REQUEST FOR AN INTERPRETATION OR A CORRECTION THEREOF, PRIOR TO FILING HIS BID PRICE FOR THE PROJECT.
12. PORTER & ASSOCIATES, INC. SHALL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ANY AND ALL CHANGES TO THESE PLANS MUST BE APPROVED IN WRITING BY PORTER & ASSOCIATES, INC.
13. TRENCHING SHALL MEET THE REQUIREMENTS OF CAL-OSHA TRENCHING ORDERS AND THE CONTRACTOR SHALL COMPLY WITH SECTION 6422 OF THE LABOR CODE.
14. TRENCHING SHALL BE BACKFILLED ACCORDING TO COUNTY STANDARD PLATE S-1. ANY TRENCHING TO BE CONDUCTED WITHIN COUNTY RIGHT-OF-WAY SHALL BE BACKFILLED AND COMPACTED AS DIRECTED BY THE COUNTY ENGINEER.
15. DURING GRADING AND CONSTRUCTION, ALL ACTIVITIES ADJACENT TO RESIDENTIAL DEVELOPMENT SHALL BE LIMITED FROM 7:00AM TO 7:00PM, MONDAY THROUGH FRIDAY. CONSTRUCTION WILL NOT BE ALLOWED ON WEEKENDS OR FEDERAL HOLIDAYS. VERIFICATION OF COMPLIANCE WITH THIS MITIGATION MEASURE SHALL BE THE RESPONSIBILITY OF THE KERN COUNTY ENGINEERING AND SURVEY SERVICES DEPARTMENT/BUILDING INSPECTION DIVISION.
16. ALL USED OIL SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS FOLLOWING CONSULTATION WITH THE KERN COUNTY ENVIRONMENTAL HEALTH SERVICES DEPARTMENT/HAZARDOUS MATERIALS SECTION, STATE OF CALIFORNIA DEPARTMENT OF HEALTH, AND THE ENVIRONMENTAL PROTECTION AGENCY. ALL USED OIL AND OTHER WASTES SHALL BE TRANSPORTED BY A REGISTERED WASTE HAULER..

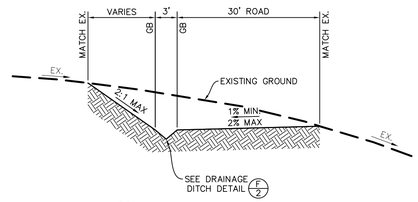
## GRADING NOTES

1. ALL GRADING AND SITE PREPARATION SHALL CONFORM TO THIS PLAN, APPENDIX J OF CALIFORNIA BUILDING CODE, AND KERN COUNTY CODE OF BUILDING REGULATIONS, AND THE FIELD RECOMMENDATIONS OF GEOTECHNICAL ENGINEER PROVIDING TESTING & GRADING OBSERVATION.
2. ALL DESIGN ELEVATIONS SHOWN ARE TO FINISHED GRADE, UNLESS OTHERWISE NOTED.
3. THE GEOTECHNICAL ENGINEER, DESIGN ENGINEER, AND BUILDING OFFICIAL SHALL BE NOTIFIED AT LEAST 2 DAYS BEFORE THE START OF ANY WORK AND PRIOR TO PLACING ANY FILL MATERIAL.
4. ALL GRADING WORK SHALL BE SUPERVISED AS "ENGINEERED GRADING" IN ACCORDANCE WITH THE BUILDING CODE. THE DESIGN ENGINEER SHALL EXERCISE SUFFICIENT SUPERVISORY CONTROL DURING GRADING AND CONSTRUCTION TO INSURE COMPLIANCE WITH THE PLANS, SPECIFICATIONS AND CODES WITHIN HIS PURVIEW.
5. SITE PREPARATION AND GRADING SHALL BE DONE UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER SHALL PROVIDE SUFFICIENT INSPECTIONS DURING THE PREPARATION OF THE NATURAL GROUND AND THE PLACEMENT AND COMPACTION OF THE FILL TO BE SATISFIED THAT THE WORK IS BEING PERFORMED IN ACCORDANCE WITH THE PLAN AND APPLICABLE CODES.
6. PURSUANT TO SECTION J104.6 OF THE CALIFORNIA BUILDING CODE AS MODIFIED BY THE KERN COUNTY CODE OF BUILDING REGULATIONS, IF THE CIVIL ENGINEER, THE GEOTECHNICAL ENGINEER, OR THE ENGINEERING GEOLOGIST OF RECORD IS CHANGED DURING GRADING, THE WORK SHALL BE STOPPED UNTIL THE REPLACEMENT HAS AGREED IN WRITING TO ACCEPT THEIR AREA OF TECHNICAL COMPETENCE FOR APPROVAL UPON COMPLETION OF THE WORK. IT SHALL BE THE DUTY OF THE PERMITTEE TO NOTIFY THE BUILDING OFFICIAL IN WRITING WITHIN 48 HOURS OF SUCH CHANGE AND PRIOR TO THE RECOMMENCEMENT OF GRADING.
7. IF DURING GRADING OR CONSTRUCTION, ANY PLUGGED, ABANDONED OR UNRECORDED WELLS ARE UNCOVERED OR DAMAGED, THE DEPARTMENT OF CONSERVATION/ DIVISION OF OIL GAS AND GEOTHERMAL RESOURCES SHALL BE CONTACTED TO INSPECT AND APPROVE ANY REMEDIATION.
8. IF DURING CONSTRUCTION ACTIVITIES OR GROUND DISTURBANCE, CULTURAL RESOURCES ARE UNCOVERED, THE CONTRACTOR SHALL STOP WORK AND RETAIN A QUALIFIED ARCHEOLOGIST FOR FURTHER STUDY. THE CONTRACTOR SHALL NOTIFY THE PROPER AUTHORITIES AND BE SUBJECT TO ANY MITIGATION MEASURES REQUIRED BY THE ARCHAEOLOGIST.
9. DURING GRADING, REASONABLE SEARCHING SHOULD BE PERFORMED FOR CONCEALED SUBSURFACE OBSTRUCTIONS. ALL ABANDONED SUBSURFACE OBSTRUCTIONS SHOULD BE REMOVED. IF THE TERMINUS OF ANY ABANDONED PIPING IS OUTSIDE THE PROJECT LIMITS, THE PIPING SHOULD BE REMOVED WITHIN THE PROJECT AND PROPERLY CAPPED AT THE PROJECT BOUNDARY.
10. ALL ONSITE OR OFFSITE OBSTRUCTIONS SHALL BE REMOVED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
11. PAD AREAS SHALL BE CLEARED OF ALL VEGETATION AND OTHER UNSUITABLE MATERIAL, SCARIFIED AND COMPACTED TO A MINIMUM DEPTH OF 12 INCHES BELOW THE EXISTING GROUND SURFACE IN AREAS TO BE FILLED OR 12 INCHES BELOW BOTTOM OF FOOTING OR 24 INCHES BELOW FINISH PAD IN CUT AREAS, UNLESS OTHERWISE SPECIFIED IN THE GEOTECHNICAL INVESTIGATION OR DIRECTED BY THE GEOTECHNICAL ENGINEER. COMPACTION IN PROPOSED AREAS ON THE SITE ON WHICH STRUCTURES ARE TO BE PLACED MUST BE COMPACTED TO 90% DENSITY FOR A MINIMUM DISTANCE OF 5 FEET BEYOND THE OUTSIDE EDGES OF THE FOUNDATIONS OF THE STRUCTURES.

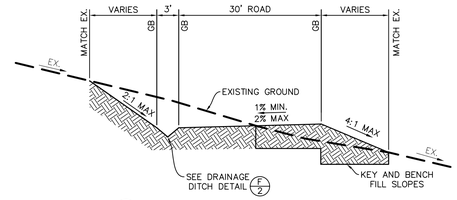
    THE DEPTH OF OVEREXCAVATION AND COMPACTION IN PAD AREAS SHALL CONFORM TO THE RECOMMENDATION OF THE GEOTECHNICAL ENGINEERING INVESTIGATION. RE-COMPACTION OF OVER-EXCAVATED MATERIAL SHALL BE TO AT LEAST 90% OF MAXIMUM DRY DENSITY.
12. FLOODING, JETTING, OR SIMILAR CONSOLIDATION METHODS OF COMPACTION SHALL NOT BE PERMITTED.
13. SURFACE DRAINAGE SHALL BE 1% MINIMUM, EXCEPT AS WAIVED BY THE BUILDING OFFICIAL.
14. ALL CUT AND FILL SLOPES SHALL BE 2:1 (2 HORIZONTAL TO 1 VERTICAL) OR FLATTER, UNLESS OTHERWISE NOTED AND APPROVED BY THE GEOTECHNICAL ENGINEER.
15. FILL AREAS SLOPING STEEPER THAN 5:1 SHALL BE KEYED AND BENCHED TO SUPPORT FILL AND SHALL BE REVIEWED BY SOILS ENGINEER.
16. FILL SLOPES SHALL NOT TOE OUT WITHIN 12 FEET HORIZONTALLY OF THE TOP OF EXISTING OR PLANNED CUT SLOPES.
17. ALL SLOPES IN EXCESS OF 3 FEET IN VERTICAL HEIGHT SHALL BE PREPARED AND MAINTAINED TO CONTROL AGAINST EROSION.
18. FILL MATERIAL SHALL BE SUBJECT TO THE GEOTECHNICAL ENGINEERS APPROVAL.
19. ENGINEERED FILL MATERIALS SHOULD BE PLACED IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS. IF NO RECOMMENDATION EXISTS, FILL SHALL BE PLACED IN THIN LAYERS LESS THAN 12 INCHES IN UNCOMPACTED THICKNESS AND COMPACTED AT OPTIMUM MOISTURE CONTENT (OR A MOISTURE CONTENT COMMENSURATE WITH EFFECTIVE COMPACTING AND SOIL STABILITY). ENGINEERED FILL MATERIALS SHOULD BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY APPROVED METHOD THE CURRENT CALIFORNIA BUILDING CODE AND CERTIFIED BY TESTS AND REPORTS FROM THE GEOTECHNICAL ENGINEER.
20. ANY CUT AND FILL QUANTITIES SHOWN ON THIS PLAN ARE FOR PERMIT PURPOSES ONLY. THE ENGINEER MAKES NO WARRANTY EITHER DIRECT OR IMPLIED THAT THIS WILL BE THE ACTUAL COMPACTION FACTOR. THE CONTRACTOR SHALL, AFTER EXAMINING THE PLAN, GEOTECHNICAL INVESTIGATION AND THE SITE TERRAIN, PREPARE HIS BID PRICE FOR THE PROJECT, BASED ON HIS OWN EARTHWORK CALCULATIONS. IF A DEFICIENCY OR AN EXCESS OF SOIL ARISES DURING GRADING, THE GRADING CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER, WHO SHALL DETERMINE IF ADJUSTMENTS CAN BE MADE TO IMPROVE THE BALANCE BETWEEN CUT AND FILL.
21. IT IS THE RESPONSIBILITY OF THE DEVELOPER AND THE CONTRACTOR TO
    (A) FAMILIARIZE THEMSELVES WITH THE FOREGOING RECOMMENDATIONS,
    (B) NOTIFY THE ENGINEER WHEN SITE PREPARATION BEGINS AND BEFORE THE PLACEMENT OF FILLS, AND
    (C) INFORM THE ENGINEER OF ITEMS ENCOUNTERED DURING EARTHWORK OPERATIONS WHICH MIGHT EFFECT FOUNDATION STABILITY, SO THAT THE ITEMS MAY BE TREATED UNDER THE ENGINEER'S DIRECTION. (THESE ITEMS MIGHT INCLUDE BURIED TRASH OR VEGETATION, PIPELINES, ABANDONED WELLS, OLD FILLS, ETC.)
22. CONTRACTOR SHALL PREVENT DUST NUISANCE, EROSION, AND STORM WATER POLLUTION BY INSTALLING BMP's AND IMPLEMENTING MEASURES REQUIRED BY THE SWPPP PREPARED FOR THIS PROJECT.



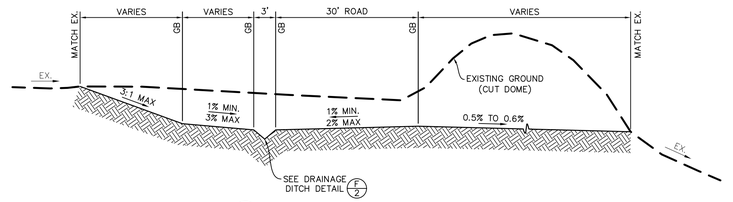

A/2 TYPICAL FILL PAD GRADING DETAIL
NTS



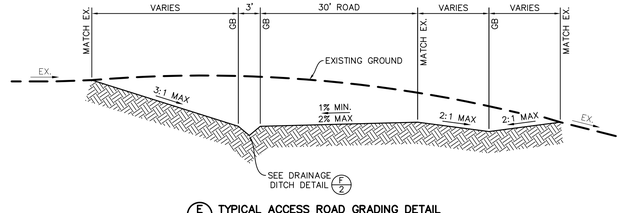

B/2 TYPICAL ACCESS ROAD GRADING DETAIL
NTS



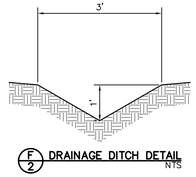

C/2 TYPICAL ACCESS ROAD GRADING DETAIL
NTS




D/2 TYPICAL CUT PAD GRADING DETAIL
NTS




E/2 TYPICAL ACCESS ROAD GRADING DETAIL
NTS




F/2 DRAINAGE DITCH DETAIL
NTS

THE ABOVE DRAWINGS AND SPECIFICATIONS, AND IDEAS, DESIGNS, AND ARRANGEMENTS REPRESENTED THEREBY, ARE AND SHALL REMAIN THE PROPERTY OF THE ENGINEER; NO PART THEREOF SHALL BE COPIED, DISCLOSED TO OTHERS, OR USED IN CONNECTION WITH ANY WORK OR PROJECT OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY HAVE BEEN PREPARED AND DEVELOPED WITHOUT THE PRIOR WRITTEN CONSENT OF THE ENGINEER. VISUAL CONTACT WITH THESE DRAWINGS OR SPECIFICATIONS SHALL CONSTITUTE CONCLUSIVE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND THIS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS. SHOP DETAILS MUST BE SUBMITTED TO THIS OFFICE FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION.

PRELIMINARY - NOT FOR CONSTRUCTION

PORTER & ASSOCIATES, INC.
ENGINEERING & SURVEYING
1200 21st Street, Bakersfield, California 93301
661.327.0362 FAX 661.327.1065

FRED W. PORTER

REGISTERED PROFESSIONAL ENGINEER * FRED W. PORTER * RCE 33448 * STATE OF CALIFORNIA * CIVIL

PROJECT ENGINEER: FWP
DRAFTSMEN: NMS
PA REVIEW BY:
DATE:

REVISIONS

# GRADING PLAN
# CAL PORTLAND COMPANY
# ROSAMOND, HILL PROPERTY
# NOTES AND SECTIONS

DATE 03/29/2019
PA JOB No. 3106

SHEET
2
OF 000 SHEETS

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PERMANENT BASE STATION
SET BY CALPORTLAND

EX. DIRT ROAD

PROPERTY LINE

CONSTRUCT LOW WATER CROSSING. CROSSING SHALL BE IN CUT. ACCESS ROAD SLOPE SHALL NOT EXCEED 8%

PLACE SECURITY BERM INSIDE PROPERTY LINE AS DIRECTED BY CAL PORTLAND

NATURAL WATER FLOW, TYP.

INSTALL GATE PER CAL PORTLAND REQUIREMENTS

FILL PAD

30' WIDE ACCESS ROAD USING NATURAL MATERIAL

MATCH EXISTING

NATURAL GROUND CONTOURS, TYP.

CONSTRUCT LOW WATER CROSSING. CROSSING SHALL BE IN CUT. ACCESS ROAD SLOPE SHALL NOT EXCEED 8%

CUT PAD

EDGE OF CUT PAD

PROPERTY LINE

MOJAVE TROPICO ROAD

NORTH
SCALE: 1"=60'
0 30 60 120

THE ABOVE DRAWINGS AND SPECIFICATIONS, AND IDEAS, DESIGNS, AND ARRANGEMENTS REPRESENTED THEREBY, ARE AND SHALL REMAIN THE PROPERTY OF THE ENGINEER; NO PART THEREOF SHALL BE COPIED, DISCLOSED TO OTHERS, OR USED IN CONNECTION WITH ANY WORK OR PROJECT OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY HAVE BEEN PREPARED AND DEVELOPED WITHOUT THE WRITTEN CONSENT OF THE ENGINEER. VISUAL CONTACT WITH THESE DRAWINGS OR SPECIFICATIONS SHALL CONSTITUTE CONCLUSIVE EVIDENCE OF ACCEPTANCE OF THESE RESTRICTIONS. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALED DIMENSIONS. CONTRACTORS AND SUBCONTRACTORS SHALL BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB, AND THIS OFFICE MUST BE NOTIFIED OF ANY VARIATIONS FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS. SHOP DETAILS MUST BE SUBMITTED TO THIS OFFICE FOR APPROVAL BEFORE PROCEEDING WITH FABRICATION.

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DRAFTSMEN: NMS
PA REVIEW BY:
DATE:

REGISTERED PROFESSIONAL ENGINEER * FRED W. PORTER * RCE 33448 * STATE OF CALIFORNIA * CIVIL

# GRADING PLAN
# CAL PORTLAND COMPANY
# ROSAMOND, HILL PROPERTY
## PLAN VIEW

REVISIONS

DATE 03/29/2019
PA JOB No. 3106

SHEET
3
OF 000 SHEETS

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# APPENDIX F:

California DPR-523 Forms

**THIS APPENDIX CONTAINED CONFIDENTIAL AND PROPRIETORY DATA - NOT FOR PUBLIC REVIEW**
**(Filed Separately)**

Appendix E.3

# Addendum Report: A Phase II Cultural Resources Investigation of the CalPortland Rosamond Hills (Gem Hill) Project Area in the Rosamond Area of Kern County (redacted version)

# ADDENDUM REPORT:

## A PHASE II CULTURAL RESOURCES INVESTIGATION OF THE CAL-PORTLAND ROSAMOND HILLS (GEM HILL) PROJECT AREA IN THE ROSAMOND AREA OF KERN COUNTY, CALIIFORNIA

Prepared for:

LILBURN CORPORATION. representing
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Author and Principal Investigator: Jeanette A. McKenna, MA/RPA/HDL

Job No. 10-19-01-2008
January 4, 2020
**REDACTED July 12, 2022**

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# ADDENDUM REPORT:

## A PHASE II CULTURAL RESOURCES INVESTIGATION OF THE CAL-PORTLAND ROSAMOND HILLS (GEM HILL) PROJECT AREA IN THE ROSAMOND AREA OF KERN COUNTY, CALIIFORNIA

by,

Jeanette A. McKenna, Principal
McKenna et al., Whittier, CA

### INTRODUCTION

In June of 2019, McKenna et al. initiated a Phase II cultural resources investigation of the CalPortland Rosamond Hills/Gem Hill property in the unincorporated area of Rosamond, Kern County, California. The CalPortland property consists of approximately 190 acres of land (Figure 1) located in portions of Township 10 North, Range 13 West, and Sections 25, 26, 35, and 36 (S.B.B.M.). This area is cross-referenced as Kern County Assessor Parcel Nos. 0345-294-17, 0345-031-02, 0345-032-02, 0345-032-05, and 0345-032-31.

The entire 190 acres was previously surveyed by CRM Tech (2019) and subsequent to a smaller survey by Lewis (1980), resulting in the recording of numerous isolates and features. These components resulted in the extension of the boundaries for [redacted], [redacted] site originally identified in 1980.

McKenna et al. was initially contracted to complete the Phase II testing of approximately 30 areas within the CalPortland property, where quarrying activities were being proposed. The results of that investigation were reported by McKenna et al. (McKenna 2019). Subsequently, McKenna et al. was contracted to complete addendum studies within the remaining acreage (per recommendations by CRM Tech) and complete a Phase I survey of an additional access road extending from Mojave Tropico Road into the overall project area (Figure 2). These subsequent studies were completed in November and December of 2019 and this addendum report (January, 2020) documents the results of the Phase I and Phase II studies. The author refers the reader to the earlier report for detailed background data not repeated in this document.

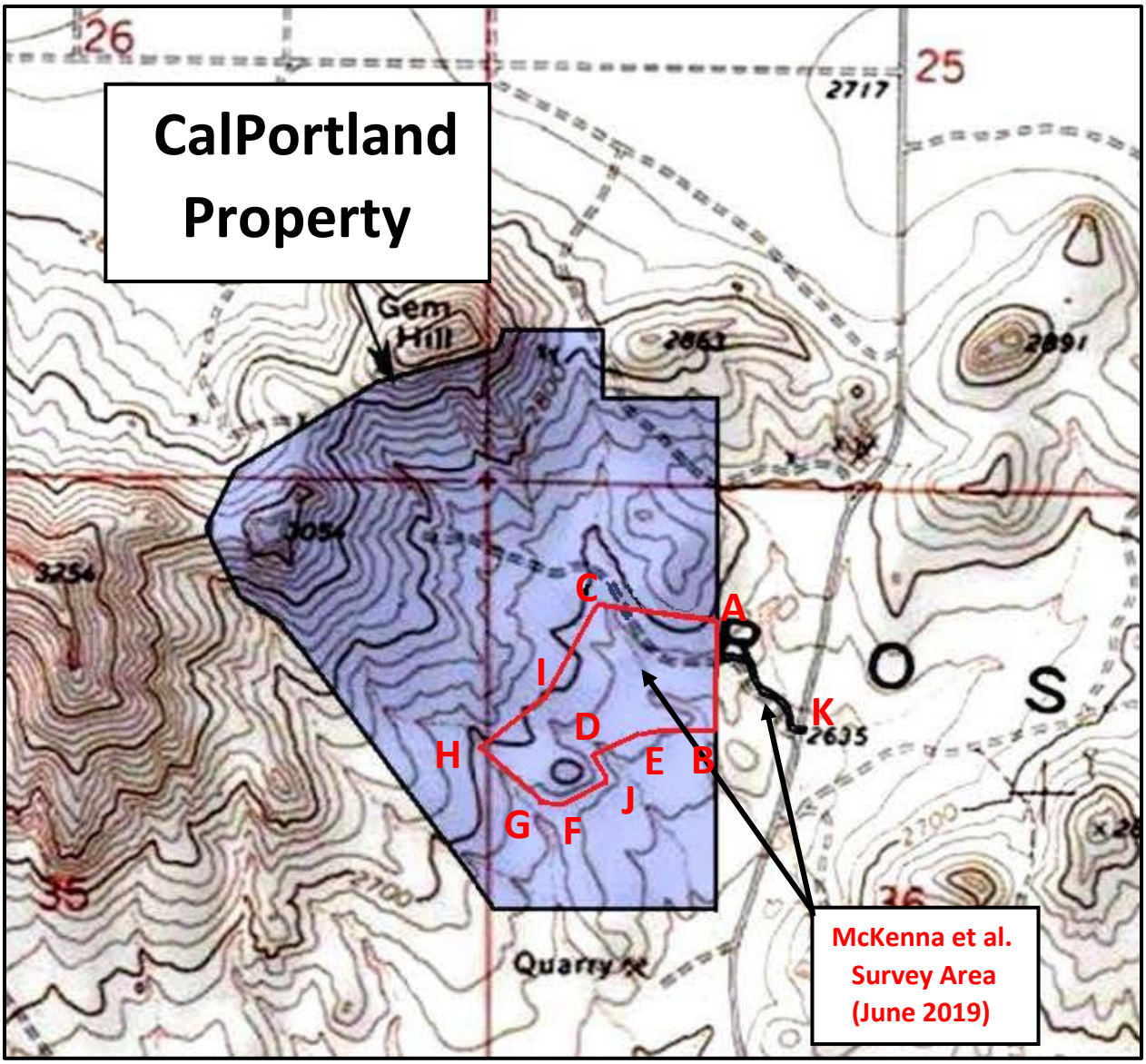



Figure 1. McKenna et al. Initial Study Area within CalPortland Project Area (USGS Soledad Mountain Quadrangle).

UTM Coordinates: (NAD 27/Top and NAD 83/Bottom, respectively)

A. 388966E/3864569N
388886E/3864765N
B. 388966E/3864384N
388886E/3864580N
C. 388752E/3864669N
388672E/3864765N
D. 388801E/3864345N
388721E/3864541N
E. 388900E/3864383N
388820E/3864579N
F. 388744E/3864206N
388664E/3864402N
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388607E/3864418N
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I. 388689E/3864405N
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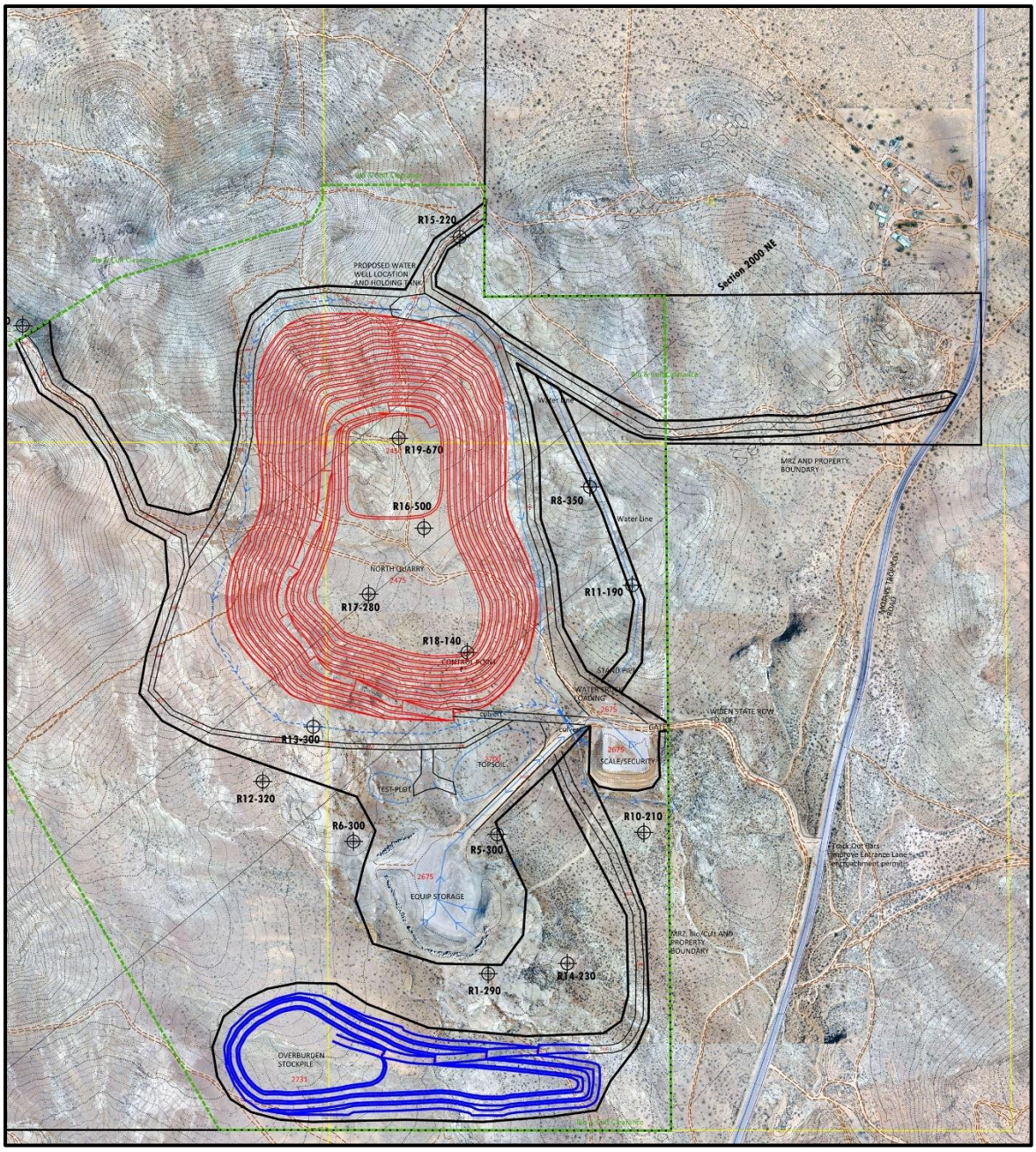



Figure 2. Additional Road Alignment and Research Areas, Gem Hill.

As illustrated, the new road alignment will be in an area associated with an existing dirt access road in the southern extent of Section 25. This alignment extends approximately .25 miles from Mojave Tropico Road before entering the original project area and is bounded by the south-facing hillside located south of the residential property in Section 25.

## LOCATION AND SETTING

The CalPortland project area is located west of the Mojave/Tropic Road and north of the community of Rosamond (also north of the Burton Gold Mine. CRM Tech provided a summary of the natural setting for their larger project area and this discussion is still applicable for the refined project area. It reads:

> "The project area is situated in the Rosamond Hills in the northern Antelope Valley, and to the northwest of the unincorporated community of Rosamond. Lying on the western rim of the Mojave Desert, the Antelope Valley is typical in climate and environment of southern California's desert country, marked by extremes in temperature and aridity. The mean minimum temperature in winter is 28º F and the mean maximum temperature in summer reaches 96º F, with temperatures over 100ºF not uncommon. The average annual precipitation is around 8-12 inches, most of which occurs between November and March.
>
> "Surrounded by open desert land, the project area extends across steep hills, precipices, and both deep and shallow erosional cuts, but is generally level with occasional low mounds that rise towards the north … Elevations range from approximately 2,620 feet above mean sea level near the southern end to nearly 3,000 feet above mean sea level at some places along the northern project boundary. Surface soils generally consist of decomposing granite, ranging from gravels to fine sands, and much of the surface area contains small to medium colluvial rocks with well-developed desert varnish … The property is located in the Western Mojave Mountains and Valleys Zone (Menke et al. 2013). Munz and Keck (1959) classified the vegetation community of this part of the Mojave Desert as Coastal Sage Scrub while the California Native Plant Society, using a newer classification system, considers the area a part of the *Atriplex lentiformis* (Quailbush scrub) Alliance (CNBPS 2019). Other plants from the vegetative community observed within the project boundaries include saltbush, creosote, ephedra, and desert grasses, as will as a single Joshua tree."

## PREVIOUS STUDIES

Lewis (1980) recorded [redacted] as an [redacted] covering an area of [redacted]. This site included the presence of [redacted]

Schiffman and Lewis (1980:3) concluded [redacted] Subsurface material is unknown but probably would yield a minimal amount of culturally modified remains … National Register Status for [redacted] is uncertain. More evaluation, including surface collection and survey of adjacent areas would be needed before a determination for National Register Status could be made." When recorded, the boundaries of [redacted] were limited to the actual survey area and not based on the extent of the resource components.

In summarizing the CalPortland property, CRM Tech (2019) noted that 190 acres of land were surveyed for cultural resources. The project area would include a quarry, processing plant, and various roads, including a main access road (existing) leading to Mojave Tropico Road (Hogan et al. 2019:i). Components of [redacted] were identified within the CalPortland project area and the results of the CRM Tech Phase I survey concluded the site boundaries to extend throughout the CalPortland property, essentially incorporating all of the 190 acre property. Hogan et al. (2019:12) stated:

[redacted]

CRM Tech (2019:15) concluded a Phase II testing program was warranted, emphasizing the recommendation to test the rock shelters. McKenna et al. was contracted to complete the Phase II studies with an understanding that the relocation of the identified CRM Tech resources would be subjected to recovery. Actual testing (excavations) would only be conducted should the archaeological context confirm the presence of soils with sufficient depth to be suggest buried resources. McKenna et al. requested the specific locational data from CRM Tech and, relying on data provided by CRM Tech and their mapping

(provided in their report of 2019), attempted to relocate and assess the identified components within the APE. The initial studies within approximately 30 acres of the project area yielded relocation and assessment of five isolated site components reported by CRM Tech (Table 1).

Table 1. Resources Identified by CRM Tech (2019) as within or near the Currently Defined APE.

| No. | NAD 83 | | NAD 27 | | Description |
|---|---|---|---|---|---|
| [redacted] | | | | | |
| [redacted] | | | | | |
| [redacted] | | | | | |
| [redacted] | | | | | |
| [redacted] | | | | | |

Of these resources, McKenna et al. confirmed the two reported fragments of ground stone (recovered by McKenna et al.) were not fragments of ground stone, but naturally occurring stone with surfaces indicative of having been ground, but upon cleaning and close examination, determined to be natural. The rock circle reported by CRM Tech was determined to be a modern hearth with no identifiable association to the prehistoric quarry site.

McKenna et al. did identified a [redacted] associated with CRM Tech flagging. The [redacted] was recovered from an area that was not conducive to subsurface deposits (e.g. light desert pavement). A sample of the [redacted] was recovered and confirmed to be a scatter dominated by unused [redacted]

While conducting the resurvey within the initial 30 acre APE, McKenna et al. also identified modern refuse concentrations (Figure 3); modern rock circles (surface hearths with evidence of recent construction and burning; Figure 4); isolated food cans (sanitary and flap seal); [redacted] None of the identified hearths were considered prehistoric, as all showed signs of recent burning, recently overturned rocks, and/or nearby modern refuse associated with the recent use of the hearths (e.g. fragment of fire wood and/or modern cans and paper wrappers).



Figure 3. An Example of Modern Refuse along Main Access Road.



Figure 4. Example of Rock Circle (Hearth) with Modern Pepsi Can and Recently Burned Wood.

Illustrated in Figure 5, [redacted], measuring 6 cm x 4.5 cm x 2.5 cm, was recovered. Such artifacts are indicative of the [redacted] identified within the overall project area. Two additional [redacted] were found in this same general location. All three pieces were recovered.



Figure 5. Rhyolite Biface.

The project area exhibits numerous scatters of various densities; consisting of deliberately broken and/or unaltered [redacted], reinforcing the previously description of the area as part of a prehistoric quarry. Similar artifacts have been identified throughout the mapped boundaries of [redacted].

McKenna et al. recorded a dense concentration of [redacted] These items were indicative of the various scatters of "shatter" and also indicative of a quarry site, where natural cobbles were shattered (tested) for examination and/or use in the production of prehistoric lithic artifacts. A sample of the shattered material was recovered by McKenna et al. Again, there was no evidence of subsurface deposits in the area and no unique or non-native materials were noted. No formal or finished tools were identified. The identified shatter did not yield evidence of "use" (no retouching, no worn edges, etc.).

The remaining resources identified by CRM Tech were not relocated as part of the June (2019) studies but, subsequently, McKenna et al. was contracted to return to the property, relocate and assess the remaining CRM Tech resources, complete a survey of the added road alignment, and/or identify any additional resources requiring assessment.

## METHODOLOGY

The approach to the final stage of the Phase I/Phase II investigations involved the relocation, if possible, of previously identified resources and to address any additional resources that may be identified within the mapped boundaries of [redacted]. To complete this level of investigation, McKenna et al. completed a reconnaissance level re-survey of the property, emphasizing those areas of previously identified resources, with the intention of relocating the CRM Tech resources. McKenna et al. obtained some additional locational data from CRM Tech, but relied on their mapped to relocate site components.

McKenna et al. completed the reconnaissance survey over the course of six field days (three days with two surveyors). The surveying was completed by Jeanette A. McKenna,

M.A. and Principal Investigator for McKenna et al., and David Asplund, B.A and field assistant. The survey was completed in a systematic manner, where terrain permitted, and subjectively when attempting to relocate specific resources. The main emphasis was placed on relocating the three rock shelters and isolated projectile point reported by CRM Tech. The remaining resources were deemed consistent with the general scattering of quarry-related resources.

As noted, these supplemental studies also involved an intensive survey of the additional road alignment. Given prior studies, prehistoric resources previously identified within the area include and/or are likely to include the following:

[redacted]

## RESULTS OF THE EXTENDED PHASE I AND PHASE II TESTING PROGRAM

As a result of the recent investigations (extended Phase I survey and Phase II testing program), McKenna et al. failed to relocate the isolated projectile point reported by CRM Tech. Although not noted in the CRM Tech report, it is possible this artifact was recovered prior to the McKenna et al. relocation effort.

McKenna et al. completed the reconnaissance survey of the 190 acre project area and an intensive level survey of the initial 30 acre impact area and additional access road alignment. As a result, McKenna et al. confirmed the presence of numerous rock rings – all determined to be of modern origin and not culturally significant. Likewise, the many dirt road alignments within the project area were determined to post-date ca. 1947 and are also of no historical significance. [redacted]

A limited amount of [redacted] materials were identified, include [redacted] None of the reported fragments of ground stone were confirmed to be ground stone, but McKenna et al. did identify some rocks with evidence of pecking (scarring from breaking other rocks). There was also some scant evidence of scarring from target practice (one bullet point recovered). Most of the broken glass identified within the project area appears to be the result of target shooting.

The three reported locations of rock shelters were relocated (Figure 6), as best could be determined, but McKenna et al. also identified other possible locations for the CRM Tech shelters



Figure 6. Reported Locations of Rock Shelters (CRM Tech Mapping).

The UTM Coordinates for these various locations were recorded in the field using a Garmin GPS unit (Table 2). The possible CRM Tech rock shelter locales are illustrated in yellow within Table 2. Regardless, all six locations reported here were determined to be non-cultural. None of the locations yielded evidence of human activity, although sparse scatters of flakes were identified nearby (and consistent with typical quarrying activities). In each case, these “cavities” were relatively small, shallow, and yielded no evidence of use other than possibly by animals (small lairs). Figures 7, 8, and 9 illustrate these natural features. There is some evidence of very recent rock movement (hearths from modern human activity), but of no historic or prehistoric significance. McKenna et al. has concluded there is no evidence of prehistoric use of these natural rock overhangs or cavities. No subsurface testing was deemed necessary.

| Table 2. Natural Rock Shelter Locations Recorded by McKenna et al. in the Field and Based Partially on CRM Tech Mapping. | | | | | |
|---|---|---|---|---|---|
| No. | NAD 83 | | NAD 27 | | Description |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |



Figure 7. Natural Shelter No. 1, Gem Hill, Kern County, CA.

## RESULTS AND RECOMMENDATIONS

Based on the research and field investigations completed by McKenna et al., it has been concluded [redacted] is a prehistoric quarry site that dominates the area now identified as the CalPortland area. This large quarry area, covering approximately 200 acres west of Mojave-Tropico Road is defined by natural deposits of rhyolite and limestone. The rhyolite was quarried by prehistoric populations, leaving the physical evidence of the



Figure 8. Natural Shelter No. 3, Gem Hill, Kern County, CA.



Figure 9. Natural Shelter No. 6, Gem Hill, Kern County, CA.

quarrying activities in the form of cores, primary and secondary waste flakes, and basic debitage. Use of the area during prehistoric times appears to have been conducted over many years (many generations), but leaving little evidence other than the waste and/or unwanted materials. [redacted]

[redacted]

The rock shelter areas were examined and determined to be natural and not associated with any use as rock shelters or work stations. No subsurface testing was warranted, as there was no cultural context to justify the excavations.

The project area, including the most recently identified access road alignment, was surveyed three times – by Lewis (1980), CRM Tech (2019) and McKenna et al. (2019). In each case, the presence of [redacted] was confirmed and the boundaries adjusted, as applicable. The more readily identifiable components of the site can be found on the east-facing and south-facing sides of Gem Hill, while sparser scatters are to the north and west.

The previously identified components of the site – including hearths, rock shelters, isolated artifacts, and scatters of cores, primary and secondary flakes, and waste flakes (debitage) were investigated and it was determined the hearths were all of modern origin. The rock shelters are not cultural features, but naturally occurring cavities that yielded no evidence of prehistoric use, but scant evidence of modern use. There were no artifacts associated with these areas, save scant evidence of the quarrying activities.

The majority of the components of [redacted] There was little evidence of soil development and the soils that were identifiable were very shallow. There was no evidence of any subsurface artifactual materials or features, save some very shallow overburden covering portions of the natural rock scatters.

[redacted]

[redacted]

Overall, [redacted] is indicative of many sites used for raw material procurement on the peripheries of the Mojave Desert. With no soil development or evidence of subsurface deposits, this area is considered to be primarily a surface site. There are no outstanding features other than the sparse-to-dense surface scatters of rhyolite cores, flakes, and debitage. While large in area and likely extending outside the currently identified boundaries, the site does not appear to be a significant cultural resource, as defined in the federal and state guidelines, as there is no immediately identifiable research potential. The use of the area is defined as a surface quarry. The raw materials procured were identified as rhyolite (a common material for prehistoric lithic tool production). There are no identifiable diagnostic artifacts and no indications as to when the site was active or how long procurement lasted.

McKenna et al. has concluded the site is not a significant cultural resource, as defined in the federal or state guidelines. It is a prehistoric resource and may, outside the current project area boundaries, yield evidence that may alter this conclusion. However, at this time, McKenna et al. has concluded the site is insignificant and no further investigations are warranted.

Based on the findings presented above, McKenna et al. is recommending the project area be considered clear of any significant cultural resources. However, being an identified archaeological site of considerable size, McKenna et al. is recommending the proposed activities within the site (e.g. mining) be subjected to spot-monitoring during road development and mining activities that involve areas not dominated by limestone deposits. This monitoring can be undertaken on a part-time basis (e.g. one every week or two), depending on the nature of the proposed activities. Should any previously unidentified feature or deposits be uncovered, such resources should be assessed in context and recommendations be presented, as warranted, should they alter the primary use and description of [redacted].

## CERTIFICATION

I hereby certified that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: Jan. 4, 2020 Signed: Jeanette A. McKenna

Jeanette A. McKenna, Principal Investigator

# REFERENCES


Ancestry.com
2019 "H. Clifford Burton." www.ancestry.com.au/boards/localities.

Anderson, M. Kat
2005 Tending the Wild: Native American Knowledge and the Management of California's Natural Resources. University of California Press, Berkeley.

Apostolides, A.
1965 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Blackburn, Thomas C. and Lowell John Bean
1978 "*Kitanemuk*." In: Handbook of North American Indians, Volume 8: California; edited by R.F. Heizer. pp. 564-569. Smithsonian Institution, Washington, D.C.

Brock, James and Katherine D. Davidson
1992 Cultural Resources Assessment of Section 31, Township 10 North, Range 12 West, Rosamond Hills Area of Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1992 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

California Native Plant Society (CNPS)
2019 A Manual of California Vegetation. Sacramento, California. www.cnps.org.

CaliSphere
1963 "Burton's Tropico Mine." Kern County Library, Beale Memorial Library. On file, McKenna et al., Whittier, California.

Darling, Curtis
1988 Kern County Place Names. Kern County Historical Society. Pioneer Publishing Company, Fresno, California.

Find-A-Grave
2019 "Horace Clifford Burton." www.findagrave.com/memorial.

Gold Ledge
2006 "Antelope Valley mines, Kern County, California, 1983." *Gold Ledge*, Volume II, Issue 1. Axiom. http://goldledge.com/photos/docs.

Hamilton, Eva, E. Beery, O. Bukley, C. McDougal, F. Rector, M. Thomason, et al.
1913 "The Heart of Antelope Valley." Antelope Valley Union High School, Lancaster. (Reprinted 1963)

Hammond, Jon
2017 "Night Sightings: Uncommon but Still Persisting." *Tehachapi News*, April 10, 2017. www.tehachapinews.com.

Hilu, Khidir W., Steve Boyd, and Peter Felker
1982 "Morphological Diversity and Taxonomy of California Mesquites *(Propoxis Leguminosae*)." *Madroño* 29(4):237-254.

Hogan, Michael, Bai Tom Tang, Deirdre Encarnaciòn, and Nina Gallardo
2019 Phase I Historical/Archaeological Resources Survey: Rosamond Hills Mine Project – Assessor's Parcel Nos. 0345-294-17; 0345-031-02, and 0345-032-02, -05, and -31, Rosamond Area, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Kern-Antelope Valley Historical Society, Inc.
1967 "Along the Rails from Lancaster to Mojave." On file, Kern County Public Library, Rosamond, Kern County, California.

Kern County Historical Society, Inc.
1984 "Burton Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

1984 "Settle Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

Larson, Kenneth A.
n.d. "Tropico Mine." www.placesearth.com.

Lewis, C.
1980 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Lewis, W. Scott
1972 "Gem Collecting in California." *Hobbies* 47:116-117.

Loop Newspaper (The)
2016 "Rosamond History." Hilltop Publishers, Tehachapi, California. www.the loopnewspaper.com.

Mauck, Jessica
2018 NA Scoping Letter for the Proposed Rosamond Hills Mine Project: Portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02, -05, and -31; 189 Acres in the Rosamond Hills Area, Kern County. On file, McKenna et al., Whittier, California.

McKenna, Jeanette A.
1987 Determination of Eligibility Report and Mitigation Recommendations for the Gladding, McBean & Co. Tropico/Glendale Facility Franciscan Mfg. Plant, Glendale, Los Angeles County, California.

1988 Architectural Investigations of the Franciscan Ceramic Plant, Glendale, CA. (w/R.G. Hatheway)

1990 "The Franciscan Ceramics Plant of Glendale, California: Makers Marks and Production Data." Paper presented at the *Annual Meeting of the Society for Historical Archaeology*, Tucson, Arizona.

2019 A Phaser II Cultural Resources Investigation of the Cal-Portland Rosamond Hills (Gem Hill) Project Area of Kern County, California. USGS Soledad Mountain Quadrangle, rev. 1973; Township 10 North; Range 13 West, S.B. B.M., Section 36. On file, McKenna et al., Whittier, California.

Menke, J., E. Reyes, A.. Glass, D. Johnson, and J. Reyes
2013 "California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan." California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission, Sacramento, California. On file, Aerial Information Systems, Redlands, California.

MinDat
2019 "Guide to the Rock and Minerals of Minecraft: Tropico Hill, Mojave-Rosamond District (Mojave District), Kern Co., California, USA." www.mindat.org.

2019 "Gem Hill." Gem Hill, Rosamond Hills, Rosamond, Mojave-Rosamond Mining District (Mojave District), Kern County, California. www.mindat.org.

Munz, Philip and David D. Keck
1959 A California Flora. University of California Press, Berkeley, California.

Murdoch, Joseph and Robert W. Webb
1966 "Minerals of California, Centennial Volume (1866-1966)." *California Division of Mines and Geology Bulletin* 189:317.

Norwood, Richard H.
1989 Archaeological Site record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

NETR
2019 Historic Aerials 1972-2014. www.historicaerials.com.

Orme, Antony R.
2004 "Lake Thomspon, Mojave Desert, California: A Desiccating Late Quaternary Lake System." US Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, Mississippi.

Osborne, Richard H., L. Wear, A. Ahif, and S. Harris
1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E.
1990 Archaeological Assessment of Tentative Tract No. 5182, Rosamond Hills, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E. and Richard Osborne
1990 Isolate Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Pemberton, H. Earl
1983 Minerals of California. Van Nostrand Reinholdt Press, New York.

Pruett, Catherine Lewis
1990 An Archaeological Assessment of 20 Acres of Land Northwest of Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Rahder, Jonathan Burton
2019 Personal Communication.

Rahder, Keith
2019 Personal Communication.

San Joaquin Valley Library System Digital Collection
2019 "Burton's Tropico Mine." digital.sjvis.org. On file, McKenna et al., Whittier, California.

Scharlotta, Ian
2014 "Trade Routes and Contradictory Spheres of Influence: Movement of Rhyolite through the Heart of the Western Mojave Desert." *California Archaeology* 6(2):219-246.

Schiffman, Robert A.
1989 Archaeological Investigation for Parcel Map No. 9166, Kern County, Califon-ria. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Schiffman, Robert A. and Catherine Lewis
1980 Archaeological Report for Prospecting Permit – Martin Trost & Associates. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serfoss, Wes
1972 Site Record Form: [redacted]. On file, California State University, Bakers-field, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serpico, Phil
2000 Railroading through the Antelope Valley. Omni Publications, Palmdlae, Cal-ifornia.

Settle, Glen A.
1967 "Rosamond and its Mining History." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 63-65.

Settle, Glen A.
1975 "The Antelope Left and the Settlers Came." J*ournal of the Kern-Antelope Historical Society, Inc.*, Rosamond, California.

Settle, Glen A. (ed.)
1963 "Here Roamed the Antelope." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 19-41.

Sheppard, R.A. and A.J. Gude
1964 "Reconnaissance of Zeolite Deposits in Tuffaceous Rocks of the Western Mojave Desert and Vicinity, California." *California Division of Mines and Geology Bulletin* 189:317. Sacramento, California.

Sutton, Mark Q.
1980 "Some Aspects of Kitanemuk Prehistory." *Journal of California and Great Basin Anthropology* 2(2):214-225.

Sutton, Mark Q., R.W. Robinson, and Jill K. Gardner
2009 "Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California." *Pacific Coast Archaeological Society Quarterly* 42(2-3):17-90.

Tipton, Karla
1983 "There's Gold in Them Thar Hills! The Story of Antelope Valley Gold." Antelope Valley Newspapers, February 24, 1983. On file, McKenna et al., Whittier, California.

Troxel, Bennie Wyatt and P.K. Morton
1962 "Mines and Mineral Resources of Kern County, California." *California Division of Mines and Geology: County Report No. 1* (370:91-92). Sacramento, California.

Tucker, W. Burling
1935 "Mining Activity at Soledad Mountain and Middle Buttes, Mohave Mining District, Kern County, California." *California Journal of Mines and Geology* 29:330-331. California Mining Bureau, Sacramento, California.

Tucker, W. Burling and Reid J. Sampson
1933 "Gold Resources of Kern County, California." *California Journal of Mines and Geology 31:482-483*. California Mining Bureau, Sacramento, California.

1940 "Current Mining Activity in Southern California. *California Journal of Mines and Geology 36(1):37*. California Mining Bureau, Sacramento, California.

Tucker, W. Burling, Reid J. Sampson, and Gordon Blaisdell Oakeshott

1949 "Mineral Resources of Kern County, California." *California Journal of Mines and Geology 45(2):234-235*. California Mining Bureau, Sacramento, California.

United States Department of the Interior

1856 Plat Map: Township 9 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 9 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1917 Elizabeth Lake Quadrangle (30'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1943 Rosamond Quadrangle (15'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1947 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1962 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1971 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1973 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1975 Los Angeles, California (1:250,000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

United States Department of the Interior
2019 "Tropico Mines." Mineral Resources Data System. mrdata.usgs.gov/mrds. On file, McKenna et al., Whittier, California.

Warren, Claude N.
1984 "The Desert Region." In: California Archaeology, ed. by M.J. Moratto. Academic Press, Orlando, Florida. pp. 339-430.

Warren, Claude N. and Robert H. Crabtree
1986 "Prehistory of the Southwestern Area." In: Handbook of North American Indians, Volume 11: Great Basin. Smithsonian Institution, Washington, D.C. pp. 183-193.

West Antelope Valley Historical Society
n.d. "Rosamond, California 93560. www.rosamondca.us.

Yohe, Robert M.
1991 An Archaeological Assessment of Approximately 350 Acres of Land in Hidden alley near Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

# APPENDIX A:

Professional Qualifications

# JEANETTE A. McKENNA

**Owner and Principal Investigator**
**McKenna et al., Whittier CA**

Ms. McKenna specializes in the discipline of Cultural Resource Management: prehistoric archaeology, historic archaeology, historic architecture, and history. She holds a Master's Degree in Anthropology/Archaeology and was recently awarded an Honorary Doctorate of Letters (HonDL) by the International Biographical Centre of Cambridge, England. She is a past member of the Board of Directors for the Society of Professional Archaeologists (SOPA 1993-97) and was certified by the Society to conduct both prehistoric and historic archaeological studies. Ms. McKenna is also recognized by the California Office of Historic Preservation as qualified to complete historic architectural studies. Ms. McKenna was on the Board of Directors for SOPA when the Society established the Registry of Professional Archaeologists (RPA) and has been a Registered Professional Archaeologist since 1998. Ms. McKenna has over 39 years of professional experience as an archaeologist/cultural resource manager and has participated on over 1700 projects of various sizes and complexities. The majority of her work has been conducted as a Field Director, Project Manager, and/or Principal Investigator throughout California and the Greater Southwest.

## TECHNICAL CAPABILITIES

- Vast experience in the greater Southwest, Great Basin, and Southern California regions. Familiar with the full range of cultural resource investigations and has completed projects within the public and private sectors, including environmental management firms, planning and engineering firms, and State and federal agencies.
- Active in the discipline of Cultural Resource Management since 1976; over 39 years of professional experience in Southern California, Arizona, and Nevada.
- Particular interest in the desert regions of California and Arizona, with specializations in the Protohistoric and Historic Contact Periods.
- Considerable experience in dealing with prehistoric cultural remains and working directly with Native American groups in archaeological training programs (Arizona State University; the Southern California Indian Center, Garden Grove).

## EDUCATION AND AFFILIATIONS

B.A., Anthropology, 1977, CSU Fullerton
M.A., Anthropology, 1982, CSU Fullerton
HonDL, 2015, Int. Biog. Centre, Cambridge
Lambda Alpha Lambda Honors Society
Post Graduate Studies, Arizona St. Univ., 1982-85
Post Graduate Studies, UC Riverside, 1991-92
Certification Program: CEQA, Land Use and Environmental Planning, UC Riverside, 1997-98
Society of Professional Archaeologists (SOPA)
Certification: Field/ Prehistoric Archaeology and Historical Archaeology (1984 to Present)
Registry of Professional Archaeologists (RPA)
Board of Directors, Society of Professional Archaeologists 1993-1997 (American Society of Conservation Archaeologists Representative)
BLM California Permit (renewable)
BLM Arizona State Permit (renewable)
Riverside County Registration No. 161
Arizona State Antiquities Permit (renewable)
Curation, San Bernardino Co. Museum
Curation, Arizona State University

## SELECTED PROJECT EXPERIENCE

- Historic Architectural Studies for Renovation and Restoration, the Greek Theatre, Los Angeles CA
- Evaluation of Cultural Resources: Burbank and West Hollywood Redevelopment Project Areas, Los Angeles County, CA
- Historic Property Survey for the City of Whittier, Los Angeles County, CA
- Archaeological Investigations and Resource Evaluations for the Proposed Cajon Pipeline, San Bernardino and Los Angeles Counties, CA
- Archaeological Class I Investigations, Proposed Mojave Pipeline, San Bernardino County, CA
- Cultural Resources Investigations (Phases I, II, III, and Mitigation Monitoring) for the RIX/SARI Projects, Santa Ana Watershed Project Authority (SAWPA), San Bernardino and Riverside Counties, CA
- Phase I, II, and III Archaeological Investigations for the County Sanitation Districts of Los Angeles County, Puente Hills Landfill Solid Waste Management Facility Expansion Project, Whittier, CA
- Archaeological Mitigation Program, Phoenix Indian School Track Site Project. Arizona State University Office of Cultural Resource Management and the Bureau of Indian Affairs, Phoenix, AZ
- Archaeological and Testing Program for the Hidden Valley Golf Course and Van Buren Golf Course Properties, Riverside County, CA
- Cultural Resources Overview Studies for the Annexation of Unincorporated County Lands to the City of Ontario, CA
- Historic Property Survey Reports: Warner Bros. Main Lot Ranch Lot Properties, Burbank, CA
- Historic Archaeological Investigations for L.A. County Sheriff's Facility, Lancaster, CA.

# APPENDIX B:

Archaeological Records Search

**THIS APPENDIX CONTAINED CONFIDENTIAL AND PROPRIETORY DATA - NOT FOR PUBLIC REVIEW**
**(Filed Separately)**

# APPENDIX C:

Native American Consultation

# McKenna et al.

History/Archaeology/Architectural History/Ethnography/Paleontology

Jeanette A. McKenna, MA
Reg. Professional Archaeologist
Owner and Principal Investigator

## SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, California 95691
(916) 373-3710 (916) 373-5471 FAX or (916) 657-5390 FAX
nahc@nahc.ca.gov

*Information Below is Required for a Sacred Lands File Search*

Date: **April 26, 2019**

Project: **Rosamond Hills Mine Project**

County: **Kern**

USGS Quadrangle: **Soladad Mountain (rev. 1973)**

Township: **10 N** Range: **13 W** p/o Section(s): **25, 26, 35, and 36**

Company/Firm/Agency: **McKenna et al.**
Contact Person: **Jeanette A. McKenna**
Street Address: **6008 Friends Avenue**
City: **Whittier, CA** Zip: **90601-3724**

Phone: **(562) 696-3852**

Cell: **(562) 754-7712**

Email: **jeanette.mckennaetal@gmail.com**

Project Description: **Approximately 190 Acres of Cal-Portland Mining Claim**

**NATIVE AMERICAN HERITAGE COMMISSION**
**Cultural and Environmental Department**
**1550 Harbor Blvd., Suite 100**
**West Sacramento, CA 95691**
**Phone: (916) 373-3710**
**Email: nahc@nahc.ca.gov**
**Website: http://www.nahc.ca.gov**
**Twitter: @CA_NAHC**

May 28, 2019

Jeanette McKenna
McKenna et al.

VIA Email to: Jeanette.mckennaetal@gmail.com.

RE: Rosamund Hills Mine Project, Kern County

Dear Ms. McKenna:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: Katy.sanchez@nahc.ca.gov.

Sincerely,

Katy Sanchez

KATY SANCHEZ
Associate Environmental Planner

Attachment

# APPENDIX D:

Photographic Record

State of California
DEPARTMENT OF PARKS AND RECREATION

# PHOTOGRAPHIC RECORD

Primary #
HRI #
Trinomial

 *Resource Name or # (assigned by recorder) Gem Hill/CalPortland Project, Kern Co., CA
Camera Format: Digital Year 2019
Film Type and Speed: Lens Size: Negatives Kept At: McKenna et al., Whittier CA

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 7 | 3 | | 1 | Overview of On-going Excavations within CalPortland Property, Gem Hill | SSW | |
| 7 | 3 | | 2 | Staging Area at Gem Hill | S | |
| 7 | 3 | | 3 | Staging Area at Gem Hill | ESE | |
| 7 | 3 | | 4 | Access Road to On-Going Excavation at Limestone Outcrop, Gem Hill | N | |
| 7 | 3 | | 5 | On-Going Excavation at Limestone Outcrop, Gem Hill | SSE | |
| 7 | 3 | | 6 | On-Going Excavation at Limestone Outcrop, Gem Hill | S | |
| 7 | 3 | | 7 | On-Going Excavation at Limestone Outcrop, Gem Hill | NNW | |
| 7 | 3 | | 8 | On-Going Excavation at Limestone Outcrop, Gem Hill | S | |
| 7 | 3 | | 9 | On-Going Excavation at Limestone Outcrop, Gem Hill | SW | |
| 7 | 3 | | 10 | On-Going Excavation at Limestone Outcrop, Gem Hill | E | |
| 7 | 3 | | 11 | On-Going Excavation at Limestone Outcrop, Gem Hill | S | |
| 7 | 3 | | 12 | On-Going Excavation at Limestone Outcrop, Gem Hill | W | |
| 7 | 3 | | 13 | Overview from Excavation Area, Gem Hill | NW | |
| 7 | 3 | | 14 | Overview of Project Area from above Excavation Area, Gem Hill | SE | |
| 7 | 3 | | 15 | Working Access Road, Gem Hill | ENE | |
| 7 | 3 | | 16 | Overview of Work Yard at Gem Hill/CalPortland Property | NE | |
| 7 | 3 | | 17 | Overview of Work Yard at Gem Hill/CalPortland Property | ENE | |
| 7 | 3 | | 18 | Overview of Project Area, Gem Hill | SE | |

State of California
DEPARTMENT OF PARKS AND RECREATION

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| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 7 | 3 | | 19 | Example of Surface Areas within Gem Hill Project Area | SE | |
| 7 | 3 | | 20 | Example of Limestone Outcroppings, Gem Hill | W | |
| 7 | 3 | | 21 | Disturbances at Site Entrance (with Gate), Gem Hill | E | |
| 7 | 3 | | 22 | Detail of Signage | Detail | |
| 7 | 3 | | 23 | Dirt Access Roads and Signage at Gem Hill | SE | |
| 7 | 3 | | 24 | Signage at Road Intersection, Gem Hill | S | |
| 7 | 3 | | 25 | Overview of Project Area with Signage along Access Roads | SW | |
| 7 | 3 | | 26 | Dirt Access Road and Signage, Gem Hill | E | |
| 7 | 3 | | 27 | Dirt Road and Signage, Gem Hill Project Area | ESE | |
| 7 | 3 | | 28 | Overview of Project Area, Gem Hill | S | |
| 7 | 3 | | 29 | Large Core, Gem Hill | Detail | |
| 7 | 3 | | 30 | Large Rhyolite Core, Gem Hill | Detail | |
| 7 | 3 | | 31 | Core Identified within the Gem Hill/CalPortland Property | Detail | |
| 7 | 3 | | 32 | Small Core, Gem Hill | Detail | |
| 7 | 3 | | 33 | Modern Debris Scatter within Site Area, Gem Hill | Detail | |
| 7 | 3 | | 34 | Example of Broken Tool, Gem Hill | Detail | |
| 7 | 3 | | 35 | Example of Broken Tool, Gem Hill | Detail | |
| 7 | 3 | | 36 | Overview of Area with Modern Marker | S | |

State of California
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**Page 3 of 3** ***Resource Name or # (assigned by recorder) Gem Hill/CalPortland Project, Kern Co., CA**
**Camera Format: Digital** **Year 2019**
**Film Type and Speed:** **Lens Size:** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 7 | 3 | | 37 | Modern CalPortland Marker within Property | N | |
| 7 | 3 | | 38 | Example of Dirt Access Road within Project Area | N | |
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**Camera Format: Digital** **Year 2019**
**Film Type and Speed:** **Lens Size:** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 11 | 15 | | 1 | Overview from Northeast Side of Gem Hill Project Area | N | |
| 11 | 15 | | 2 | Overview from Northeast Side of Gem Hill Project Area | NNW | |
| 11 | 15 | | 3 | Overview from Northeast Side of Gem Hill Project Area | NW | |
| 11 | 15 | | 4 | Outcrops, Northeast Side of Gem Hill Project Area | SSE | |
| 11 | 15 | | 5 | Outcrops, Northeast Side of Gem Hill Project Area | E | |
| 11 | 15 | | 6 | Overview of Northeast Side of Gem Hill Project Area | SE | |
| 11 | 15 | | 7 | Overview of Northeast Side of Gem Hill Project Area | SW | |
| 11 | 15 | | 8 | Overview from Northeast Side of Gem Hill Project Area | N | |
| 11 | 15 | | 9 | Access Road on North Side of Project Area, Gem Hill | W | |
| 11 | 15 | | 10 | Access Road on North Side of Project Area, Gem Hill | E | |
| 11 | 15 | | 11 | Outcropping on North Side of Project Area, Gem Hill | E | |
| 11 | 15 | | 12 | Access Road on North Side of Project Area, Gem Hill | W | |
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**Film Type and Speed:** **Lens Size:** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 11 | 17 | | 1 | Prior Excavations at Gem Hill | E | |
| 11 | 17 | | 2 | Prior Excavations at Gem Hill | N | |
| 11 | 17 | | 3 | Prior Excavations at Gem Hill | NE | |
| 11 | 17 | | 4 | Prior Excavations at Gem Hill | N | |
| 11 | 17 | | 5 | Road above Excavations at Gem Hill | N | |
| 11 | 17 | | 6 | Soil Sample Bags Identified within the Gem Hill Project Area | Detail | |
| 11 | 17 | | 7 | Disturbed Areas above Excavations at Gem Hill | W | |
| 11 | 17 | | 8 | Natural Rock Overhang within the Gem Hill Project Area | WSW | |
| 11 | 17 | | 9 | Natural Rock Overhang within the Gem Hill Project Area | NW | |
| 11 | 17 | | 10 | Natural Rock Overhang within the Gem Hill Project Area | N | |
| 11 | 17 | | 11 | Natural Rock Overhang within the Gem Hill Project Area | WSW | |
| 11 | 17 | | 12 | Natural Rock Overhang within the Gem Hill Project Area | SW | |
| 11 | 17 | | 13 | Overview of Natural Rock Outcropping within the Gem Hill Project Area | SE | |
| 11 | 17 | | 14 | Remnants of Soil Sampling, Gem Hill | Detail | |
| 11 | 17 | | 15 | Access Trail in Hills above Excavations at Gem Hill | WSW | |
| 11 | 17 | | 16 | Access Trail in Hills above Excavations at Gem Hill | NW | |
| 11 | 17 | | 17 | Natural Rock Overhang within the Hillside, Gem Hill | NNE | |
| 11 | 17 | | 18 | Natural Rock Overhang within the Hillside, Gem Hill | W | |

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**Page 2 of 2** ***Resource Name or # (assigned by recorder) Gem Hill/CalPortland Project, Kern Co., CA**
**Camera Format: Digital** **Year 2019**
**Film Type and Speed:** **Lens Size:** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 11 | 17 | | 19 | Natural Rock Overhang within the Hillside, Gem Hill | SW | |
| 11 | 17 | | 20 | Natural Rock Overhang within the Hillside, Gem Hill | W | |
| 11 | 17 | | 21 | Natural Rock Overhang within the Hillside, Gem Hill | SSE | |
| 11 | 17 | | 22 | Overview of Project Area from Northwestern Portion of Property | SE | |
| 11 | 17 | | 23 | Overview of Project Area from Northwestern Portion of Property | NE | |
| 11 | 17 | | 24 | Ca. 1960s Can Identified within the Property | Detail | |
| 11 | 17 | | 25 | Isolated Stake Identified within the Property | SW | |
| 11 | 17 | | 26 | Natural Overhang within Gem Hill Project Area | WNW | |
| 11 | 17 | | 27 | Natural Overhang within Gem Hill Project Area | NNW | |
| 11 | 17 | | 28 | Soil Sample Bags Identified within the Gem Hill Project Area | E | |
| 11 | 17 | | 29 | Soil Samples along Road Cut, Gem Hill Project Area | ESE | |
| 11 | 17 | | 30 | Soil Sampling along Road Cut, Gem Hill Project Area | E | |
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State of California
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**Page 1 of 1** ***Resource Name or # (assigned by recorder) Gem Hill/CalPortland Project, Kern Co., CA**
**Camera Format: Digital** **Year 2019**
**Film Type and Speed:** **Lens Size:** **Negatives Kept At: McKenna et al., Whittier CA**

| Month | Day | Time | Frame | Description | View | Acc. # |
|---|---|---|---|---|---|---|
| 12 | 20 | | 1 | Overview of Mojave-Tropico Road from Secondary Access Road, Gem Hill | N | |
| 12 | 20 | | 2 | Overview of Mojave-Tropico Road from Secondary Access Road, Gem Hill | S | |
| 12 | 20 | | 3 | Overview of Secondary Access Road from Mojave-Tropico Road, Gem Hill | W | |
| 12 | 20 | | 4 | Overview of Secondary Access Road from Mojave-Tropico Road, Gem Hill | W | |
| 12 | 20 | | 5 | Sample of Core within Quarry Area (CA-KER-1203); near Access Road | Detail | |
| 12 | 20 | | 6 | Shatter along Access Road (recent), Gem Hill | Detail | |
| 12 | 20 | | 7 | Overview of Secondary Access Road off Mojave-Tropico Road, Gem Hill | W | |
| 12 | 20 | | 8 | Overview of Hill South of Access Road, with Soil Sample Bags | S | |
| 12 | 20 | | 9 | Example of Desert Pavement adjacent to Access Road | N | |
| 12 | 20 | | 10 | Overview of Secondary Access Road, Gem Hill | W | |
| 12 | 20 | | 11 | Overview of Project Area from Secondary Access Road, Gem Hill | SW | |
| 12 | 20 | | 12 | Overview of Project Area from Secondary Access Road, Gem Hill | SE | |
| 12 | 20 | | 13 | Overview of Project Area from Secondary Access Road, Gem Hill | ENE | |
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Appendix E.4

# Supplemental Report: Cultural Resource Investigations of Additional Acreage At The CalPortland Rosamond Hills (Gem Hill) Project Area in the Rosamond Area of Kern County, California (redacted version)

# SUPPLEMENTAL REPORT:

CULTURAL RESOURCE INVESTIGATIONS
OF ADDITIONAL ACREAGE AT THE CALPORTLAND
ROSAMOND HILLS (GEM HILL) PROJECT AREA
IN THE ROSAMOND AREA OF KERN
COUNTY, CALIIFORNIA

Prepared for:

LILBURN CORPORATION
Attn: Frank Amendola
1905 Business Center Drive
San Bernardino, California 92408

Prepared by:

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(562) 696-3852
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Author and Principal Investigator: Jeanette A. McKenna, MA/RPA/HDL

Job No. 07-21-08-2140
August 23, 2021
**REDACTED July 12, 2022**

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# SUPPLEMENTAL REPORT:

## CULTURAL RESOURCE INVESTIGATIONS OF ADDITIONAL ACREAGE AT THE CALPORTLAND ROSAMOND HILLS (GEM HILL) PROJECT AREA IN THE ROSAMOND AREA OF KERN COUNTY, CALIIFORNIA

by,

Jeanette A. McKenna, Principal
McKenna et al., Whittier, CA

### INTRODUCTION

CRM Tech of Colton, California, completed a Phase I cultural resources investigation of the Rosamond Hills Mine project area in Kern County, California. Prior to the CRM Tech survey, Lewis (1980) completed a survey of a portion of the property, resulting in the recording of numerous isolates and features. These components resulted in the extension of the boundaries for [redacted].

The final CRM Tech report confirmed the presence of cultural resources related to the quarry and recommended a Phase II testing program to assess the significance of the resources. McKenna et al. (2019) conducted the Phase II investigations within the 190-acre property (Figure 1) located in portions of Township 10 North, Range 13 West, and Sections 25, 26, 35, and 36 (S.B.B.M.). This area is cross-referenced as Kern County Assessor Parcel Nos. 0345-294-17, 0345-031-02, 0345-032-02, 0345-032-05, and 0345-032-31.

McKenna et al. was initially contracted to complete the Phase II testing of approximately 30 acres within the CalPortland property, where direct impacts from anticipated quarrying activities were being proposed. The results of that investigation were reported by McKenna et al. (2019) and McKenna et al. was contracted to complete addendum studies within the remaining acreage (per recommendations by CRM Tech) and complete a Phase I survey of an access road extending from Mojave Tropico Road into the overall project area (Figure 2). This access road area was outside the boundaries of the CRM Tech survey area but within the area surveyed by Lewis in 1980 (McKenna 2020). The author refers the reader to the earlier report for detailed background data not repeated in this document.



Figure 1. McKenna et al. Initial Study Area within CalPortland Project Area (USGS Soledad Mountain Quadrangle).

UTM Coordinates: (NAD 27/Top and NAD 83/Bottom, respectively)

A. 388966E/3864569N
388886E/3864765N
B. 388966E/3864384N
388886E/3864580N
C. 388752E/3864669N
388672E/3864765N
D. 388801E/3864345N
388721E/3864541N
E. 388900E/3864383N
388820E/3864579N
F. 388744E/3864206N
388664E/3864402N
G. 388687E/3867222N
388607E/3864418N
H. 388589E/3864328N
388509E/3864524N
I. 388689E/3864405N
388609E/3864601N
J. 388827E/3864274N
388747E/3864470N
K. 389129E/3864379N
389048E/3864574N

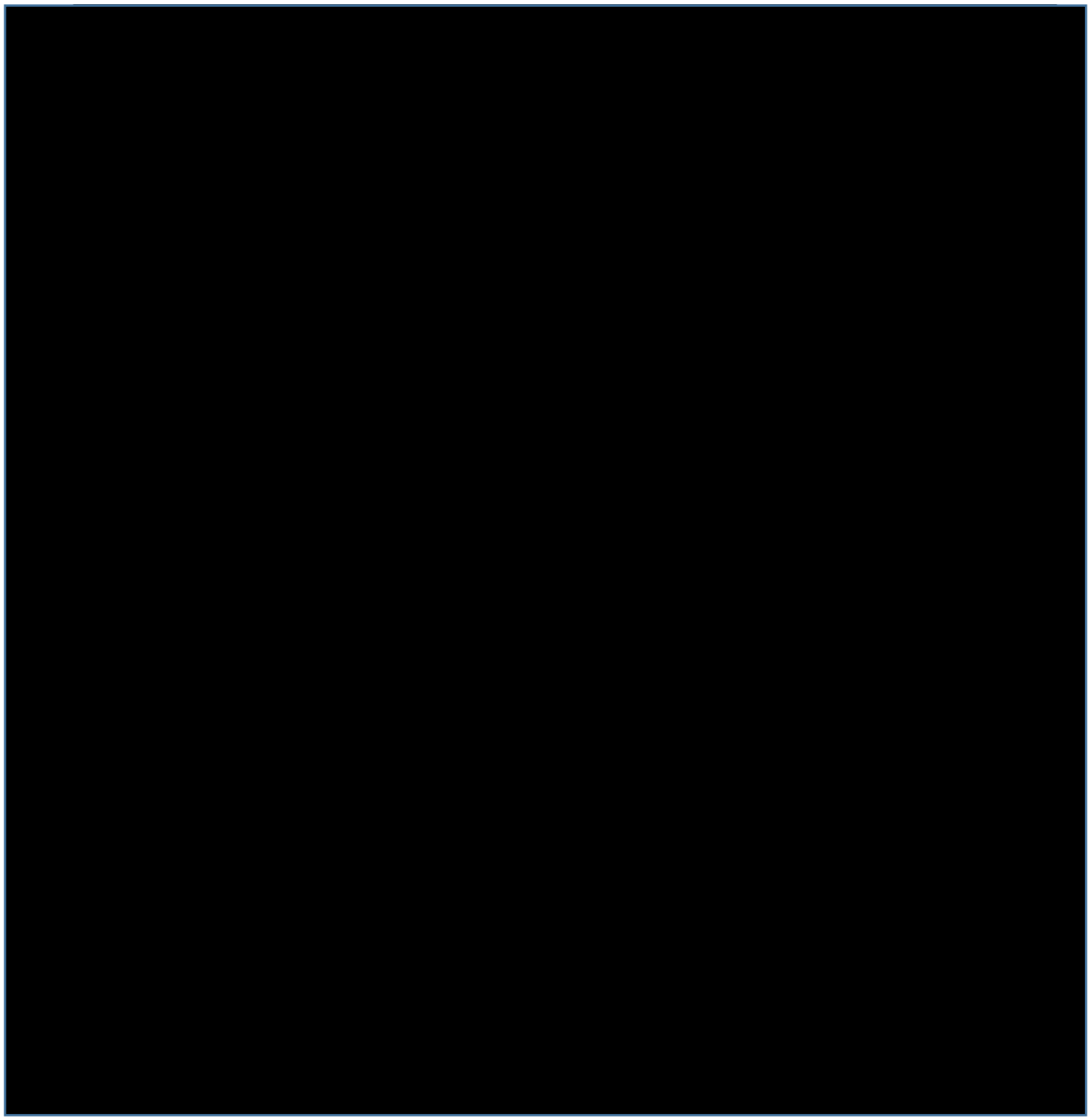


Figure 2. Additional Road Alignment and Research Areas, Gem Hill.

As illustrated, the new road alignment would be in an area associated with an existing dirt access road in the southern extent of Section 25. This alignment extends approximately .25 miles from Mojave Tropico Road and enters the original project area.

The current investigations address an additional area to the west/southwest of the original survey area (Figure 3). This triangular addition follows the southern boundary of the Cal-

Portland property and extends to the north/northwest, eventually connecting with the western boundary of the previously surveyed property. This additional area measures approximately 1,000 feet (east/west) and 1500 feet north/south). These dimensions equated to approximately 17 acres of additional land dominated by the gentle sloping terrain south/southwest of the Gem Hill peak and the northeast quarter of Section 35 (Figure 4).

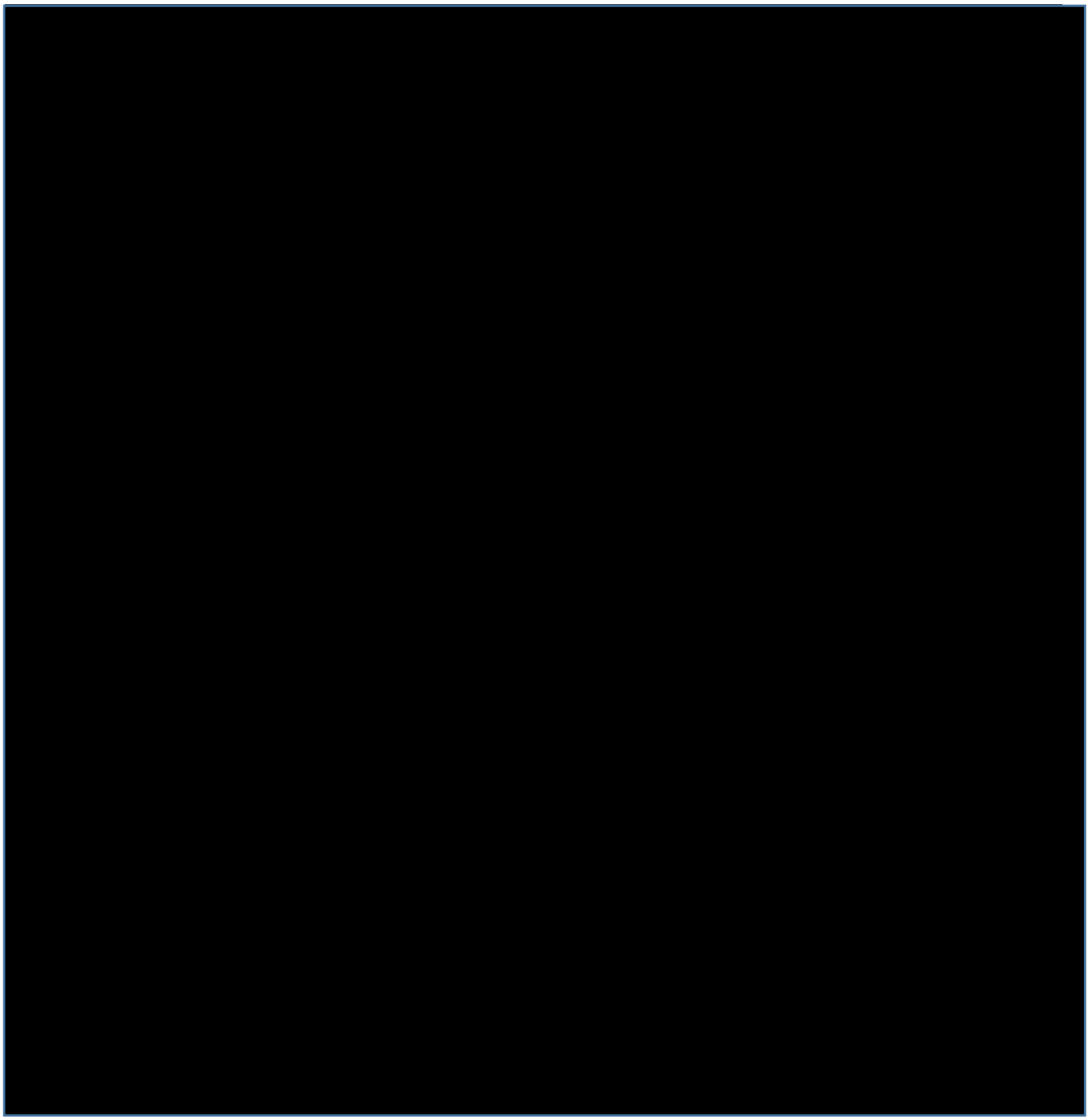


Figure 3. Gem Hill Project Area with Added Acreage (delineated in red; USGS Soledad Mtn. Quadrangle, rev. 2018).

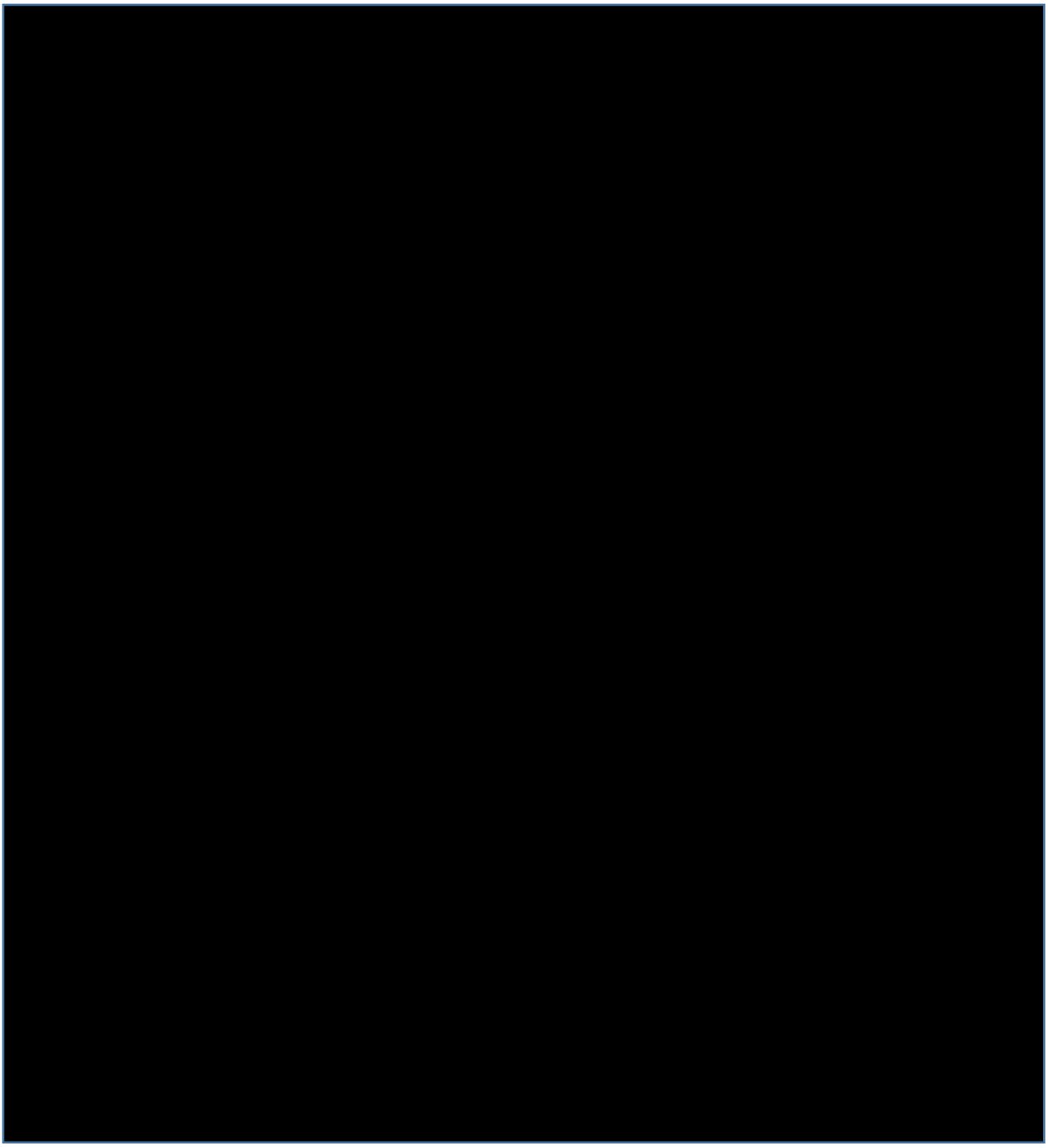


Figure 4. Aerial Photograph Illustrating Original and Additional Survey Areas.

## LOCATION AND SETTING

The CalPortland project area is located west of the Mojave/Tropic Road and north of the community of Rosamond (also north of the Burton Gold Mine. CRM Tech provided a summary of the natural setting for their larger project area and this discussion is still applicable for the refined project area. It reads:

> "The project area is situated in the Rosamond Hills in the northern Antelope Valley, and to the northwest of the unincorporated community of Rosamond. Lying on the western rim of the Mojave Desert, the Antelope Valley is typical in climate and environment of southern California's desert country, marked by extremes in temperature and aridity. The mean minimum temperature in winter is 28º F and the mean maximum temperature in summer reaches 96º F, with temperatures over 100ºF not uncommon. The average annual precipitation is around 8-12 inches, most of which occurs between November and March.
>
> "Surrounded by open desert land, the project area extends across steep hills, precipices, and both deep and shallow erosional cuts, but is generally level with occasional low mounds that rise towards the north … Elevations range from approximately 2,620 feet above mean sea level near the southern end to nearly 3,000 feet above mean sea level at some places along the northern project boundary. Surface soils generally consist of decomposing granite, ranging from gravels to fine sands, and much of the surface area contains small to medium colluvial rocks with well-developed desert varnish … The property is located in the Western Mojave Mountains and Valleys Zone (Menke et al. 2013). Munz and Keck (1959) classified the vegetation community of this part of the Mojave Desert as Coastal Sage Scrub while the California Native Plant Society, using a newer classification system, considers the area a part of the *Atriplex lentiformis* (Quailbush scrub) Alliance (CNBPS 2019). Other plants from the vegetative community observed within the project boundaries include saltbush, creosote, ephedra, and desert grasses, as will as a single Joshua tree."

## PREVIOUS STUDIES

Lewis (1980) recorded [redacted]

Schiffman and Lewis (1980:3) concluded [redacted] National Register Status for [redacted] is uncertain. More evaluation, including surface collection and survey of adjacent areas would be needed before a determination for National Register Status could be made." When recorded, the boundaries of [redacted] were limited to the survey area and not based on the areal extent of the resources.

In summarizing the CalPortland property, CRM Tech (2019) noted that 190 acres of land were surveyed for cultural resources. The project area would include a quarry, processsing plant, and various roads, including a main access road (existing) leading to Mojave Tropico Road (Hogan et al. 2019:i). Components of [redacted] were identified within the CalPortland project area and the results of the CRM Tech Phase I survey concluded the site boundaries to extend throughout the CalPortland property, essentially incorporating all of the 190-acre property. Specifically, Hogan et al. (2019:12) stated:

[redacted]

As noted, CRM Tech (2019:15) concluded a Phase II testing program was warranted, emphasizing the recommendation to test the rock shelters. McKenna et al. was contracted to complete the Phase II studies with an understanding that the relocation of the identified CRM Tech resources would be subjected to recovery. Actual testing (excavations) would only be conducted if the subsequent site visit and archaeological context confirmed the presence of soils with sufficient depth to be suggest buried resources, as not surface artifacts were reported in the areas of the rock shelters. McKenna et al. requested the specific locational data from CRM Tech and, relying on this data, attempted

to relocate and assess the identified cultural components within the APE. The initial studies within approximately 30 acres of the direct impact area yielded relocation and assessment of five isolated site components reported by CRM Tech (Table 1).

Table 1. Resources Identified by CRM Tech (2019) as within or near the Currently Defined APE.

| No. | NAD 83 | | NAD 27 | | Description |
|---|---|---|---|---|---|
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |
| [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] |

Of these resources, McKenna et al. confirmed the two reported fragments of [redacted] (recovered by McKenna et al.) were not fragments of [redacted], but naturally occurring stone with surfaces [redacted] upon cleaning and close examination, determined to be natural. The rock circle reported by CRM Tech was determined to be a modern hearth with no identifiable association to the prehistoric quarry site.

McKenna et al. did identified a [redacted] These materials were identified in an area of very shallow soil development and not evidence of any significant depth. Subsurface testing was not conducted, as it was deemed unnecessary to disturb the area further.

While conducting the resurvey within the initial 30-acre direct impact APE, McKenna et al. also identified modern refuse concentrations (Figure 5); modern rock circles (surface hearths with evidence of recent construction and burning; Figure 6); isolated food cans (sanitary and flap seal); [redacted]

All of the artifacts identified as prehistoric were considered additional components of [redacted]. None of the identified hearths were prehistoric, as all showed signs of recent burning, recently overturned rocks, and/or nearby modern refuse associated with the recent use of the hearths (e.g., pieces of modern firewood and/or modern cans and paper wrappers).



Figure 5. An Example of Modern Refuse along Main Access Road.



Figure 6. Example of Rock Circle (Hearth) with Modern Pepsi Can and Recently Burned Wood.

Illustrated in Figure 7, [redacted] Such artifacts are indicative of the [redacted] identified within the overall project area. Two additional [redacted] All three pieces were recovered.



Figure 7. Rhyolite Biface.

The project area exhibits numerous scatters of various densities; consisting of deliberately broken and/or unaltered [redacted], reinforcing the previously description of the area as part of [redacted]

McKenna et al. also recorded a dense concentration of [redacted] Again, there was no evidence of subsurface deposits in the area and no unique or non-native materials were noted. No formal or finished tools were identified although utilized flakes were evident. The greater majority of identified shatter did not yield evidence of "use" (no retouching, no worn edges, etc.), suggesting manufacturing of formal tools took place outside the identified [redacted].

As a result of the McKenna et al. extended Phase I survey and Phase II testing program, McKenna et al. failed to relocate the isolated projectile point reported by CRM Tech. Although not noted in the CRM Tech report, it is possible this artifact was recovered prior to the McKenna et al. relocation effort.

McKenna et al. completed the reconnaissance survey of the 190 acre project area and an intensive level survey of the initial 30 acre impact area and the alignment for the additional access road. As a result, McKenna et al. confirmed the presence of numerous rock rings – all determined to be of modern origin and not culturally significant. Likewise, the many dirt road alignments within the project area were determined to post-date ca. 1947 and are also of no historical significance.

[redacted]

[redacted] There was also some scant evidence of scarring from target practice (one bullet point recovered). Most of the broken glass identified within the project area appears to be the result of target shooting.

The three reported locations of rock shelters were relocated (Figure 8), as best could be determined, but McKenna et al. also identified other possible locations for the CRM Tech shelters



Figure 8. Reported Locations of Rock Shelters (CRM Tech Mapping).

The UTM Coordinates for these various locations were recorded in the field using a Garmin GPS unit (Table 2). The possible CRM Tech rock shelter locales are illustrated in yellow within Table 2. Regardless, all six locations reported here were determined to be non-cultural.

None of the locations yielded evidence of human activity, [redacted]. In each case, these "cavities" were relatively small, shallow, and yielded no evidence of use other than possibly by animals (small lairs). McKenna et al. concluded there is no evidence of prehistoric use of these natural rock overhangs or cavities. No subsurface testing was deemed necessary.

Table 2. Natural Rock Shelter Locations Recorded by McKenna et al. in the Field and Based Partially on CRM Tech Mapping.

| No. | NAD 83 | | NAD 27 | | Description |
|---|---|---|---|---|---|
| [redacted] | | | | | |

## RESULTS OF THE RECENT SURVEY

As noted, approximately 17 acres of land have been added to the previous 190+ acres of CalPortland indirect and direct use areas. In August of 2021, McKenna et al. returned to the property to complete an intensive survey of the 17+ acres. In doing so, McKenna et al. covered an area larger than the mapped boundaries to insure coverage. The survey area was accessed from the existing CalPortland facility and from north to south. In defining the northern point of the additional acreage (point "A" on Figure 4), McKenna et al. walked a north/south transect to a point south of point "B"; east to point "C" and then east/west transects back to the point of beginning. Over the course of this survey, McKenna et al. maintained a photographic record (attached) and noted the presence of [redacted].

The [redacted] identified by McKenna et al. consisted of [redacted]

McKenna et al. also identified [redacted] (Figures 9 and 10). The [redacted] was one of two identified during the recent survey. This artifact measures 9 cm by 6 cm by 1.5 cm and of the local [redacted]. The tip is shaped and warn by use. Its shape easily and comfortably fits into a right-hand for use, consistent with the majority of individuals (90% +/- individuals are right-handed).



Figure 9. Burin/Awl at Gem Hill.



Figure 10. Utilized Flake at Gem Hill.

The [redacted]e with evidence of shaping and various utilized surfaces. This artifact measures 5.5 cm by 4 cm by .5 cm but is broken and was likely up to twice its current size. The shaping was done around the bulb of percussion, rendering the center of the artifact thicker than the edges. The shaping suggests this artifact may have been designed to be a blade (this being the base) or a multi-sided scraper (a more formal tool). Both of these artifacts were recovered.

McKenna et al. also photo-document an area on the desert pavement that suggested the presence of a [redacted], but this feature has not been confirmed. No formal tools were identified in the vicinity and there appears to be no significant depth to the soils to indicate a potential for buried deposits (Figure 11).

This potential ring is approximately 2.5 meters in diameter and consists of larger cobbles between smaller cobbles. The center of the circle does not appear to be any different from the surrounding surface and, again, there are no formal tools in the area. The larger cobbles were the only defining components. McKenna et al. noted its presence but does not consider this a definitive feature and cannot attribute its presence to any prehistoric activities.

In addition to the [redacted], McKenna et al. documented the presence of a number of dirt access roads (light and well-worn roads), modern refused from dumping and camping, and modern hearths. One area near the eastern boundary of the survey area (against the low knolls in the southern portion of the original survey area) McKenna et al. noted the presence of an extensively used *ad hoc* shooting range. This area shows evidence of recent activities (Figure 12).



Figure 11. Possible Rock Ring with the Gem Hill Area (not definitively cultural).



Figure 12. Modern Use Area (Camping and Target Shooting).

These areas will require some clean-up but are not indicative of historic-period resources and are not considered culturally significant.

Based on the research and field investigations completed by McKenna et al. (2019, 2020, and 2021) the site of [redacted] and/or the CalPortland area. [redacted] Previously identified rock shelters were negated by Phase II assessment and no ground stone artifacts were identified by McKenna et al. [redacted]

Use of the area during prehistoric times appears to have been conducted over many years (many generations), leaving evidence of the quarrying but little else. Habitation occurred elsewhere and likely nearer a fresh water source. [redacted]

The numerous fragments of [redacted] reported by CRM Tech in 2019 but later confirmed to be non-cultural [redacted]. Some pecked stone was identified but left *in situ*. Such [redacted]. A sample of the debitage, cores, and waste flakes was recovered by McKenna et al. in 2019 and 2020 [redacted]

Based on the findings within the recently surveyed area, McKenna et al. has concluded the [redacted], therefore, the boundaries of [redacted] have been revised to reflect the larger site area. The primary lithic material associated with this site is [redacted]. There was scant evidence of other lithic materials (chert and quartzite), but the area was more readily identified by the presence of the rhyolite and limestone deposits. There was little evidence of soil development. There was no evidence of any subsurface artifactual materials or features.

[redacted]

There is no evidence of “gems.” The evidence within the CalPortland property indicates the Native American populations were quarrying the rhyolite rock for use in the production of lithic tools. In this case, the final stages of tool production were accomplished elsewhere (off-site) as was habitation.

[redacted] yielded evidence of raw material procurement and some on-site testing or reduction. The isolated artifacts (non-rhyolite) were extremely sparse and not indicative of any particular activity.

Overall, as a [redacted] is indicative of many sites used for raw material procurement on the peripheries of the Mojave Desert. With no soil development or evidence of subsurface deposits, the site area is considered to be a surface scatter with both concentrations and broad scatters of varying densities. There are no outstanding features other than the sparse-to-dense surface scatters of rhyolite cores, flakes, and debitage.

The recently surveyed 17-acre property yielded resources consistent with the defined site of [redacted]. No unique or exotic materials were identified and no formal tools were documented [redacted]. The site is still likely to extend outside the recently defined boundaries (based solely on the extent of the survey area).

As previously reported, this site does not appear to be a significant cultural resource as defined in the federal and state guidelines. There is no immediately identifiable research potential as the use of the site has been determined [redacted]; it is not a habitation site; there are no significant features or depth; and there are no diagnostic artifacts to assist in dating the site activities. The raw materials procured were identified as naturally occurring [redacted]

McKenna et al. has concluded the site is not a significant cultural resource, as defined in the federal or state guidelines. It is a prehistoric resource and may, outside the current project area boundaries, yield evidence that may require a reconsideration of this findings. However, at this time, McKenna et al. has concluded the site is insignificant and no further investigations are warranted. No paleontological resources were identified during the recent survey.

## CONCLUSIONS AND RECOMMENDATIONS

Based on the findings presented above, McKenna et al. is recommending the project area be considered clear of any significant cultural resources. However, [redacted] McKenna et al. is recommending the proposed activities within the site (e.g., mining) be subjected to spot-monitoring during road development and mining activities that involve areas not dominated by limestone deposits. This monitoring can be undertaken on a part-time basis, pending the nature of the proposed activities and concurrence by the Lead Agency.

Should any previously unidentified feature or deposits be uncovered, such resources should be assessed in context through a formal Phase II assessment and recommendations be presented, as deemed appropriate. This assessment may result in a change in the status of the site.

CERTIFICATION

I hereby certified that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: Aug. 23, 2021 Signed: Jeanette A. McKenna

Jeanette A. McKenna, Principal Investigator

# REFERENCES


Ancestry.com
2019 "H. Clifford Burton." www.ancestry.com.au/boards/localities.

Anderson, M. Kat
2005 Tending the Wild: Native American Knowledge and the Management of California's Natural Resources. University of California Press, Berkeley.

Apostolides, A.
1965 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Blackburn, Thomas C. and Lowell John Bean
1978 "*Kitanemuk*." In: Handbook of North American Indians, Volume 8: California; edited by R.F. Heizer. pp. 564-569. Smithsonian Institution, Washington, D.C.

Brock, James and Katherine D. Davidson
1992 Cultural Resources Assessment of Section 31, Township 10 North, Range 12 West, Rosamond Hills Area of Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1992 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

California Native Plant Society (CNPS)
2019 A Manual of California Vegetation. Sacramento, California. www.cnps.org.

CaliSphere
1963 "Burton's Tropico Mine." Kern County Library, Beale Memorial Library. On file, McKenna et al., Whittier, California.

Darling, Curtis
1988 Kern County Place Names. Kern County Historical Society. Pioneer Publishing Company, Fresno, California.

Find-A-Grave
2019 "Horace Clifford Burton." www.findagrave.com/memorial.

Gold Ledge
2006 "Antelope Valley mines, Kern County, California, 1983." *Gold Ledge*, Volume II, Issue 1. Axiom. http://goldledge.com/photos/docs.

Hamilton, Eva, E. Beery, O. Bukley, C. McDougal, F. Rector, M. Thomason, et al.
1913 "The Heart of Antelope Valley." Antelope Valley Union High School, Lancaster. (Reprinted 1963)

Hammond, Jon
2017 "Night Sightings: Uncommon but Still Persisting." *Tehachapi News*, April 10, 2017. www.tehachapinews.com.

Hilu, Khidir W., Steve Boyd, and Peter Felker
1982 "Morphological Diversity and Taxonomy of California Mesquites *(Propoxis Leguminosae*)." *Madroño* 29(4):237-254.

Hogan, Michael, Bai Tom Tang, Deirdre Encarnaciòn, and Nina Gallardo
2019 Phase I Historical/Archaeological Resources Survey: Rosamond Hills Mine Project – Assessor's Parcel Nos. 0345-294-17; 0345-031-02, and 0345-032-02, -05, and -31, Rosamond Area, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Kern-Antelope Valley Historical Society, Inc.
1967 "Along the Rails from Lancaster to Mojave." On file, Kern County Public Library, Rosamond, Kern County, California.

Kern County Historical Society, Inc.
1984 "Burton Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

1984 "Settle Family." On file, Kern County Public Library, Rosamond, Kern County, California. (reprinted 1991)

Larson, Kenneth A.
n.d. "Tropico Mine." www.placesearth.com.

Lewis, C.
1980 Archaeological Site Survey Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Lewis, W. Scott
1972 “Gem Collecting in California.” *Hobbies* 47:116-117.

Loop Newspaper (The)
2016 “Rosamond History.” Hilltop Publishers, Tehachapi, California. www.the loopnewspaper.com.

Mauck, Jessica
2018 NA Scoping Letter for the Proposed Rosamond Hills Mine Project: Portions of APNs 0345-294-17, 0345-031-02, and 0345-032-02, -05, and -31; 189 Acres in the Rosamond Hills Area, Kern County. On file, McKenna et al., Whittier, California.

McKenna, Jeanette A.
1987 Determination of Eligibility Report and Mitigation Recommendations for the Gladding, McBean & Co. Tropico/Glendale Facility Franciscan Mfg. Plant, Glendale, Los Angeles County, California.

1988 Architectural Investigations of the Franciscan Ceramic Plant, Glendale, CA. (w/R.G. Hatheway)

1990 “The Franciscan Ceramics Plant of Glendale, California: Makers Marks and Production Data.” Paper presented at the *Annual Meeting of the Society for Historical Archaeology*, Tucson, Arizona.

2019 A Phaser II Cultural Resources Investigation of the Cal-Portland Rosamond Hills (Gem Hill) Project Area of Kern County, California. USGS Soledad Mountain Quadrangle, rev. 1973; Township 10 North; Range 13 West, S.B. B.M., Section 36. On file, McKenna et al., Whittier, California.

2020 Addendum Report: A Phase II Cultural Resources Investigation of the Cal-Portland Rosamond Hills (Gem Hill) Project area in the Rosamond Area of Kern County, California. On file, McKenna et al., Whittier, California.

2020 Gem Hill Supplemental (Paleontological Overview). On file, McKenna et al., Whittier, California.

Menke, J., E. Reyes, A.. Glass, D. Johnson, and J. Reyes
2013 “California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan.” California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission, Sacramento, California. On file, Aerial Information Systems, Redlands, California.

MinDat
2019 "Guide to the Rock and Minerals of Minecraft: Tropico Hill, Mojave-Rosamond District (Mojave District), Kern Co., California, USA." www.mindat.org.

2019 "Gem Hill." Gem Hill, Rosamond Hills, Rosamond, Mojave-Rosamond Mining District (Mojave District), Kern County, California. www.mindat.org.

Munz, Philip and David D. Keck
1959 A California Flora. University of California Press, Berkeley, California.

Murdoch, Joseph and Robert W. Webb
1966 "Minerals of California, Centennial Volume (1866-1966)." *California Division of Mines and Geology Bulletin* 189:317.

Norwood, Richard H.
1989 Archaeological Site record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

NETR
2019 Historic Aerials 1972-2014. www.historicaerials.com.

Orme, Antony R.
2004 "Lake Thomspon, Mojave Desert, California: A Desiccating Late Quaternary Lake System." US Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, Mississippi.

Osborne, Richard H., L. Wear, A. Ahif, and S. Harris
1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E.
1990 Archaeological Assessment of Tentative Tract No. 5182, Rosamond Hills, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

1990 Archaeological Site Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Parr, Robert E. and Richard Osborne
1990 Isolate Record: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Pemberton, H. Earl
1983 Minerals of California. Van Nostrand Reinholdt Press, New York.

Pruett, Catherine Lewis
1990 An Archaeological Assessment of 20 Acres of Land Northwest of Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Rahder, Jonathan Burton
2019 Personal Communication.

Rahder, Keith
2019 Personal Communication.

San Joaquin Valley Library System Digital Collection
2019 "Burton's Tropico Mine." digital.sjvis.org. On file, McKenna et al., Whittier, California.

Scharlotta, Ian
2014 "Trade Routes and Contradictory Spheres of Influence: Movement of Rhyolite through the Heart of the Western Mojave Desert." *California Archaeology* 6(2):219-246.

Schiffman, Robert A.
1989 Archaeological Investigation for Parcel Map No. 9166, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Schiffman, Robert A. and Catherine Lewis
1980 Archaeological Report for Prospecting Permit – Martin Trost & Associates. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serfoss, Wes
1972 Site Record Form: [redacted]. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

Serpico, Phil
2000 Railroading through the Antelope Valley. Omni Publications, Palmdale, California.

Settle, Glen A.
1967 "Rosamond and its Mining History." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 63-65.

Settle, Glen A.
1975 "The Antelope Left and the Settlers Came." J*ournal of the Kern-Antelope Historical Society, Inc.*, Rosamond, California.

Settle, Glen A. (ed.)
1963 "Here Roamed the Antelope." *Journal of the Kern-Antelope Historical Society*, Rosamond, California. pp. 19-41.

Sheppard, R.A. and A.J. Gude
1964 "Reconnaissance of Zeolite Deposits in Tuffaceous Rocks of the Western Mojave Desert and Vicinity, California." *California Division of Mines and Geology Bulletin* 189:317. Sacramento, California.

Sutton, Mark Q.
1980 "Some Aspects of Kitanemuk Prehistory." *Journal of California and Great Basin Anthropology* 2(2):214-225.

Sutton, Mark Q., R.W. Robinson, and Jill K. Gardner
2009 "Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California." *Pacific Coast Archaeological Society Quarterly* 42(2-3):17-90.

Tipton, Karla
1983 "There's Gold in Them Thar Hills! The Story of Antelope Valley Gold." Antelope Valley Newspapers, February 24, 1983. On file, McKenna et al., Whittier, California.

Troxel, Bennie Wyatt and P.K. Morton
1962 "Mines and Mineral Resources of Kern County, California." *California Division of Mines and Geology: County Report No. 1* (370:91-92). Sacramento, California.

Tucker, W. Burling
1935 "Mining Activity at Soledad Mountain and Middle Buttes, Mohave Mining District, Kern County, California." *California Journal of Mines and Geology* 29:330-331. California Mining Bureau, Sacramento, California.

Tucker, W. Burling and Reid J. Sampson
1933 "Gold Resources of Kern County, California." *California Journal of Mines and Geology 31:482-483*. California Mining Bureau, Sacramento, California.

Tucker, W. Burling and Reid J. Sampson
1940 "Current Mining Activity in Southern California. *California Journal of Mines and Geology 36(1):37*. California Mining Bureau, Sacramento, California.

Tucker, W. Burling, Reid J. Sampson, and Gordon Blaisdell Oakeshott
1949 "Mineral Resources of Kern County, California." *California Journal of Mines and Geology 45(2):234-235*. California Mining Bureau, Sacramento, California.

United States Department of the Interior
1856 Plat Map: Township 9 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 9 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 12 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1856 Plat Map: Township 10 North; Range 13 West. On file, Bureau of Land Management, General Land Office (BLM-GLO). On file, McKenna et al., Whittier, California.

1917 Elizabeth Lake Quadrangle (30'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1943 Rosamond Quadrangle (15'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1947 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1962 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

United States Department of the Interior
1971 Bakersfield Quadrangle (1:250.000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1973 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

1975 Los Angeles, California (1:250,000). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

2015 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

2018 Soledad Mountain Quadrangle (7.5'). United States Geological Survey (USGS). On file, McKenna et al., Whittier, California.

2019 "Tropico Mines." Mineral Resources Data System. mrdata.usgs.gov/mrds. On file, McKenna et al., Whittier, California.

Warren, Claude N.
1984 "The Desert Region." In: California Archaeology, ed. by M.J. Moratto. Academic Press, Orlando, Florida. pp. 339-430.

Warren, Claude N. and Robert H. Crabtree
1986 "Prehistory of the Southwestern Area." In: Handbook of North American Indians, Volume 11: Great Basin. Smithsonian Institution, Washington, D.C. pp. 183-193.

West Antelope Valley Historical Society
n.d. "Rosamond, California 93560. www.rosamondca.us.

Yohe, Robert M.
1991 An Archaeological Assessment of Approximately 350 Acres of Land in Hidden alley near Rosamond, Kern County, California. On file, California State University, Bakersfield, Southern San Joaquin Valley Information Center, Bakersfield, Kern County, California.

# APPENDIX A:
## Professional Qualifications

# JEANETTE A. McKENNA

**Owner and Principal Investigator**
**McKenna et al., Whittier CA**

Ms. McKenna specializes in the discipline of Cultural Resource Management: prehistoric archaeology, historic archaeology, historic architecture, and history. She holds a Master's Degree in Anthropology/Archaeology and was recently awarded an Honorary Doctorate of Letters (HonDL) by the International Biographical Centre of Cambridge, England. She is a past member of the Board of Directors for the Society of Professional Archaeologists (SOPA 1993-97) and was certified by the Society to conduct both prehistoric and historic archaeological studies. Ms. McKenna is also recognized by the California Office of Historic Preservation as qualified to complete historic architectural studies. Ms. McKenna was on the Board of Directors for SOPA when the Society established the Registry of Professional Archaeologists (RPA) and has been a Registered Professional Archaeologist since 1998. Ms. McKenna has over 39 years of professional experience as an archaeologist/cultural resource manager and has participated on over 1700 projects of various sizes and complexities. The majority of her work has been conducted as a Field Director, Project Manager, and/or Principal Investigator throughout California and the Greater Southwest.

## TECHNICAL CAPABILITIES

- Vast experience in the greater Southwest, Great Basin, and Southern California regions. Familiar with the full range of cultural resource investigations and has completed projects within the public and private sectors, including environmental management firms, planning and engineering firms, and State and federal agencies.
- Active in the discipline of Cultural Resource Management since 1976; over 39 years of professional experience in Southern California, Arizona, and Nevada.
- Particular interest in the desert regions of California and Arizona, with specializations in the Protohistoric and Historic Contact Periods.
- Considerable experience in dealing with prehistoric cultural remains and working directly with Native American groups in archaeological training programs (Arizona State University; the Southern California Indian Center, Garden Grove).

## EDUCATION AND AFFILIATIONS

B.A., Anthropology, 1977, CSU Fullerton
M.A., Anthropology, 1982, CSU Fullerton
HonDL, 2015, Int. Biog. Centre, Cambridge
Lambda Alpha Lambda Honors Society
Post Graduate Studies, Arizona St. Univ., 1982-85
Post Graduate Studies, UC Riverside, 1991-92
Certification Program: CEQA, Land Use and Environmental Planning, UC Riverside, 1997-98
Society of Professional Archaeologists (SOPA)
Certification: Field/ Prehistoric Archaeology and Historical Archaeology (1984 to Present)
Registry of Professional Archaeologists (RPA)
Board of Directors, Society of Professional Archaeologists 1993-1997 (American Society of Conservation Archaeologists Representative)
BLM California Permit (renewable)
BLM Arizona State Permit (renewable)
Riverside County Registration No. 161
Arizona State Antiquities Permit (renewable)
Curation, San Bernardino Co. Museum
Curation, Arizona State University

## SELECTED PROJECT EXPERIENCE

- Historic Architectural Studies for Renovation and Restoration, the Greek Theatre, Los Angeles CA
- Evaluation of Cultural Resources: Burbank and West Hollywood Redevelopment Project Areas, Los Angeles County, CA
- Historic Property Survey for the City of Whittier, Los Angeles County, CA
- Archaeological Investigations and Resource Evaluations for the Proposed Cajon Pipeline, San Bernardino and Los Angeles Counties, CA
- Archaeological Class I Investigations, Proposed Mojave Pipeline, San Bernardino County, CA
- Cultural Resources Investigations (Phases I, II, III, and Mitigation Monitoring) for the RIX/SARI Projects, Santa Ana Watershed Project Authority (SAWPA), San Bernardino and Riverside Counties, CA
- Phase I, II, and III Archaeological Investigations for the County Sanitation Districts of Los Angeles County, Puente Hills Landfill Solid Waste Management Facility Expansion Project, Whittier, CA
- Archaeological Mitigation Program, Phoenix Indian School Track Site Project. Arizona State University Office of Cultural Resource Management and the Bureau of Indian Affairs, Phoenix, AZ
- Archaeological and Testing Program for the Hidden Valley Golf Course and Van Buren Golf Course Properties, Riverside County, CA
- Cultural Resources Overview Studies for the Annexation of Unincorporated County Lands to the City of Ontario, CA
- Historic Property Survey Reports: Warner Bros. Main Lot Ranch Lot Properties, Burbank, CA
- Historic Archaeological Investigations for L.A. County Sheriff's Facility, Lancaster, CA.

# APPENDIX B:
## Photographic Record

**THIS APPENDIX CONTAINED CONFIDENTIAL AND PROPRIETORY DATA - NOT FOR PUBLIC REVIEW**
**(Filed Separately)**

# APPENDIX C:

## Updated DPR-523 Forms

**THIS APPENDIX CONTAINED CONFIDENTIAL AND PROPRIETORY DATA - NOT FOR PUBLIC REVIEW**
**(Filed Separately)**

Appendix F

# Energy Utilization Study

# ENERGY UTILIZATION STUDY
# FOR
# GEM HILL QUARRY
# KERN COUNTY, CALIFORNIA

***Prepared For:***

CalPortland Company
2025 E. Financial Way
Glendora, CA 91741

***Prepared By:***

Lilburn Corporation
1905 Business Center Drive
San Bernardino, CA 92408

**Updated August 2022 & December 2021**
**January 2021**

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## APPENDIX


Appendix A Fuel Estimates Tables and References

# 1.0 INTRODUCTION

CalPortland Company (CalPortland) has submitted an application for the Gem Hill Quarry Mine Conditional Use Permit (CUP) and a Reclamation Plan to Kern County for the development of a 35-acre quarry within a 210-acre project area. The site is located in the western Antelope Valley, approximately five miles northwest of Rosamond, California and ten miles southwest of Mojave, California on the west end of the Rosamond Hills in southeastern Kern County (County) (portions of APNs 0345-294-17, 0345-032-05, 0345-032-31, and 0345-031-02). The Project Site is vacant and undeveloped (see Figures 1 and 2 for regional location and project vicinity maps).

The Mine and Reclamation Plan (Plan) for the Gem Hill Quarry describes the planned operations for a period of 30 years from approval. The planned operation includes a quarry, two overburden stockpiles, stormwater catchment basins, an equipment storage area, water well, scale, and access roads on a proposed disturbance area of approximately 82 acres. Production will be up to 500,000 tons per year (tpy) of volcanic tuff or pozzolan; approximately 1,670 tons/day on 300 operational days/year. Approximately 20,000 tpy of overburden are estimated.

The Gem Hill pozzolans will act as a carbon reduction operation, an important element to reduce energy consumption and greenhouse gas (GHG) emissions. Pozzolanic materials react in a synergistic way with portland cement and thus can be utilized to replace a portion of clinker and portland cement used in the manufacturing of portland cement as well as a portion of portland cement in ready-mix concrete. The utilization of Gem Hill pozzolan will reduce the carbon footprint (GHG) of cement and concrete production as an ingredient in concrete.

This energy utilization study estimates the amount of energy including gasoline and diesel fuels, electricity, and natural gas expected to be utilized on an annual basis. The amount of energy used is compared to statewide consumption and determined if a potential substantial user, and measures to reduce energy use are recommended. Background material including average fuel economy of vehicles and fuel consumption in the state are included in Appendix A.

# 2.0 PROJECT DESCRIPTION

The planned operation includes the quarry, two overburden stockpiles, stormwater basins for potential run-off, an equipment storage area, a water well, scale, and access roads on a proposed disturbance area of approximately 82 acres. Typical mining operations will consist of blasting about once per week, dozing, and stockpiling the tuff materials. The material will be loaded onto on-road trucks and hauled to existing cement production facilities. The material does not require crushing or processing, therefore, there will be no processing plant operations conducted on-site, limiting the production of dust and noise on-site. Typical hours of operation will be during daylight hours (generally 7:00 a.m. to 7:00 p.m. Monday through Saturday depending on the season), six days per week depending on market demand with the understanding that longer or alternative hours may be required due to operational constraints.

An access road at Mojave Tropico Road will serve as the main ingress and egress for the Proposed Project. Operations will include approximately 10 full-time employees with about 10 truck

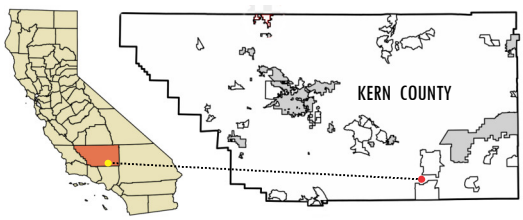



N

0 10

MILES

Source: Lilburn Corp., Feb. 2020.




LILBURN CORPORATION

# REGIONAL LOCATION

**Gem Hill Quarry**

**Surface Mining Permit and Reclamation Plan**

Kern County, CA

**FIGURE 1**

Soledad Mountain

PROJECT SITE

MOJAVE TROPICO ROAD

26

25

35

36

ROSAMOND HILLS

14

T10N R13W T10N R12W

T09N R13W T09N R12W

Willow Springs Butte

Tropico Hill

N

0 4,500'

FEET

Source: Lilburn Corp., Feb. 2020.

KERN COUNTY

LILBURN CORPORATION

# PROJECT VICINITY

**Gem Hill Quarry**

**Surface Mining Permit and Reclamation Plan**

Kern County, CA

**FIGURE 2**

drivers. Security gates and signs will be located on the access road entrance at the property boundary.

Material is transported by street-legal 25-ton capacity haul trucks directly from the quarry off-site to various clients and markets; 25-ton trucks, 6 days/week averaging approximately 67 truck trips/day with a round trip distance estimated at an average of 52 miles.

# 3.0 APPLICABLE ENERGY POLICES, PLANS, AND REGULATIONS

California is one of the lowest per capita energy users in the United States, ranked 48th in the nation, due to its energy efficiency programs and mild climate (United States Energy Information Administration [EIA] 2018). California consumed 292,040 gigawatt-hours (GWh) of electricity and 2,110,830 million cubic feet of natural gas in 2017 (California Energy Commission [CEC] 2019; EIA 2018). In addition, Californians consume approximately 18.5 billion gallons of motor vehicle fuels per year (Federal Highway Administration 2019). The single largest end-use sector for energy consumption in California is transportation (39.8 percent), followed by industry (23.7 percent), commercial (18.9 percent), and residential (17.7 percent) (EIA 2018).

Most of California's electricity is generated in-state with approximately 30 percent imported from the Northwest and Southwest in 2017. In addition, approximately 30 percent of California's electricity supply comes from renewable energy sources such as wind, solar photovoltaic, geothermal, and biomass (CEC 2018). Adopted on September 10, 2018, SB 100 accelerates the State's Renewables Portfolio Standards Program by requiring electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

To reduce statewide vehicle emissions, California requires that all motorists use California Reformulated Gasoline, which is sourced almost exclusively from in-state refineries. Gasoline is the most used transportation fuel in California with 15.3 billion gallons sold in 2019 and is used by light-duty cars, pickup trucks, and sport utility vehicles (California Department of Tax and Fee Administration 2018). Diesel is the second most used fuel in California with 3.14 billion gallons sold in 2019 and is used primarily by heavy duty-trucks, delivery vehicles, buses, trains, ships, boats and barges, farm equipment, and heavy-duty construction and military vehicles (California Department of Tax and Fee Administration 2019) (CEC 2019). Both gasoline and diesel are primarily petroleum-based, and their consumption releases greenhouse gas (GHG) emissions, including CO2 and NOX. The transportation sector is the single largest source of GHG emissions in California, accounting for 40 percent of all inventoried emissions in 2018 (California Air Resources Board [CARB] 2020).

*Building Energy Efficiency Standards*

The CEC adopted Title 24, Part 6, of the California Code of Regulations; Energy Conservation Standards for new residential and nonresidential buildings in June 1977 and standards are updated every three years. Title 24 (now called the Building Energy Efficiency Standards) ensures building designs conserve energy by requiring the use of new energy efficiency technologies and methods into new developments. Currently, the CEC Title 24 2019 Building Energy Efficiency Standards

are in effect to be updated in 2022. The Building Energy Efficiency Standards state that nonresidential buildings will use about 30 percent less energy compared to the 2016 standards due mainly to lighting upgrades.

*Senate Bill 350*

Senate Bill (SB) 350 (de Leon) was signed into law in October 2015 and established new clean energy, clean air, and greenhouse gas reduction goals for 2030. SB 350 establishes periodic increases to the California Renewables Portfolio Standard (RPS) Program with the target to increase the amount of electricity generated per year from eligible renewable energy resources to an amount that equals at least 33% of the total electricity sold annually to retail customers, by December 31, 2020. The SB 350 specifically calls for the quantities of eligible renewable energy resources to be procured for all other compliance periods reflecting reasonable progress in each of the intervening years to ensure that the procurement of electricity products from eligible renewable energy resources achieves 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030.

*Senate Bill 100*

Senate Bill 100 (SB 100) was signed into law September 2018 and increased the goal of the California RPS Program to achieve at least 50 percent renewable resources by 2026, 60 percent renewable resources by 2030, and 100 percent renewable resources by 2045. SB 100 also includes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

SB 100 mandates 100 percent clean electricity for California by 2045. The applicant is not proposing to connect to the grid.

# 4.0 ENERGY UTILIZATION

To estimate energy usage, the proposed project is divided into three phases described as follows:

- Construction or improvement of the off-site unpaved access road on SLC land for two days and 40 days for construction of on-site roads and basins;
- Mining operations for a 30-year period consisting of excavation, loading, and transporting material off-site; and
- Reclamation activities to grade slopes, re-distribute soils; and revegetate for an active period of approximately 80 days.

The proposed project is essentially a construction-type project as the material would be excavated by loaders and transported to markets by street-legal haul trucks. Upon completion of mining, all disturbed slopes will be reclaimed and revegetated as outlined in the Reclamation Plan.

Reclamation activities would occur within a one-year period after the completion of mining. In addition, the off-site access road located on State property per lease with the State Lands Commission, will be widened from 12 to 36 feet in width over a length of approximately 845 feet. Construction and reclamation fuel usage is assessed separately below.

## 4.1 Roads and Basins Construction Fuel Usage

CalPortland has estimated 42 days of construction for roads and basins with the equipment and hours listed below in Table 1. Approximate diesel fuel usage for the 42 days of construction is estimated at 8,038 gallons of diesel fuel and 911 gallons of gasoline. Fuel usage calculations are compiled in Appendix A, Tables E1 and E4.

**Table 1**
**Roads and Basins Construction Equipment Fuel Usage**

| Construction Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year[1] (gallons) |
|---|---|---|---|---|---|---|
| Backhoe | 1 | 4 | 100 | 0.37 | 8 | 329 |
| Soil Compactor | 1 | 4 | 172 | 0.42 | 15 | 642 |
| Grader | 1 | 6 | 268 | 0.41 | 35 | 1,465 |
| Dozer (D8) | 1 | 6 | 347 | 0.40 | 44 | 1,850 |
| Water Truck | 1 | 6 | 260 | 0.38 | 31 | 1,317 |
| Dump Truck | 1 | 4 | 260 | 0.38 | 21 | 878 |
| Excavator | 1 | 6 | 172 | 0.38 | 21 | 968 |
| Off-site deliveries | 2 | 84 miles/day | 6 MPG | --- | 14 | 588 |
| **Total Diesel Fuel** | --- | --- | --- | --- | 175 | **8,038** |
| **Employee Trips - Gasoline** | 10 | Miles/Trip 52 | MPG 24 | --- | 21.7 | 911 |

1 – 42 construction days.
Numbers rounded.
**Sources: See Appendix A**
- Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors in gallons per horsepower-hour: HP: 0 to 100 =0.059. HP: Greater than 100 = 0.0529.
United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.
- Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policy information/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data Last updated 02/11/2020

- CAT Performance Handbook Edition 48, June 2018.

- CalEEMod Load Factors Appendix D October 2017.

## 4.2 Mining Operations Fuel Usage

There is no processing plant equipment proposed on-site; therefore no commercial electricity will

be utilized.

Approximately six pieces of heavy off-road construction-type equipment including up to 10 on-road haul trucks (22 to 26-ton) and a water truck are proposed for mining, hauling, and road maintenance activities on-site. Haul trucks and diesel equipment will meet all requirements of the California Air Resources Board's (CARB) off-road diesel vehicles regulation to reduce diesel pollutants and be maintained to optimize fuel consumption. Two small generators will be operated on-site for the on-site water well and power for an office trailer/scale house. The typical equipment and days in operation annually are listed in Table 2 below.

**Table 2**
**Typical Quarry Equipment**
**Gem Hill Quarry**

| Equipment | Typical Number | Typical Days/year | Purpose |
|---|---|---|---|
| Front-End Loader (CAT 980 typ.) | 1 | 300 | Loading of excavated materials into haul trucks at quarry. |
| Dozer (CAT D8 typ.) | 1 | 150 | Mining and stockpiling of pozzolan material. Removal of topsoil and waste rock. Construction and maintenance of roads and quarry benches. |
| Excavator (CAT 325 typ.) | 1 | 60 | Mining and stockpiling of pozzolan material and overburden. |
| Grader (CAT 140 typ.) | 1 | 60 | Removal of topsoil and waste rock. Construction and maintenance of roads. |
| Drill Rig (PowerROC T25 typ.) | 1 | 130 | Drill holes for placement of explosives. |
| On-Road Haul Trucks (25-ton trucks typ.) | 10 | 300 | Transportation of excavated material to various clients and overburden to stockpiles. |
| Water Truck (4,000 gallons) | 1 | 300 | Water spray haul roads, active quarry areas, overburden stockpiles, and general dust control onsite. |
| Tractor skid steer | 1 | 60 | Removal of topsoil and waste rock. Construction and maintenance of roads. |
| Generator Sets (50 hp typ) (CAT XQ 35 typ) | 2 | 300 | Power for water well pump and scale/office trailer. |
| Ancillary Equipment | Varies | Varies | maintenance vehicles, bobcat, backhoe, pick-ups, SUVs, etc. |

Source: CalPortland 2020
List above is typical equipment to be used on-site. Equipment types are not expected to vary. Specific equipment will change during the life of the project due to replacement of aging equipment and updated equipment and fleet averaging requirements. Hours per day varies with demand and ore/overburden quantities.

The operations, the production rates, and shipping plans are listed below for the planned operations.

- Production – average of 1,670 tons/day, 500,000 tons/year (depending on market demand)

- Hours of Operation – Typical operations will be completed in one shift during daylight hours; approximately 10 hours/day, 6 days/week; 300 days/year; equipment hours vary (typical, depending on demand).
- Material is transported by street-legal 25-ton capacity haul trucks (Class 8) directly from the quarry to be transported off-site to various clients and markets; 25-ton trucks, 6 days/week averaging approximately 67 truck trips/day. At 52 miles per round trip, approximately 3,500 truck miles will occur per day.
- Approximately 10 trips/day for employees and 2 trips for other vehicles are estimated in miles listed in Table 3.

**Table 3**
**Mining Operations Fuel Usage**

| Mining Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year[1] (gallons) |
|---|---|---|---|---|---|---|
| Loader | 1 | 10 | 369 | 0.36 | 70 | 21,082 |
| Excavator | 1 | 2.5 | 172 | 0.38 | 9 | 2,593 |
| Grader | 1 | 2 | 268 | 0.41 | 12 | 3,488 |
| Dozer | 1 | 5 | 347 | 0.40 | 37 | 11,014 |
| Water Truck | 1 | 10 | 260 | 0.38 | 52 | 15,680 |
| Bore/Drill Rig | 1 | 5 | 160 | 0.50 | 21 | 6,348 |
| Skid Steer Loader | 1 | 5 | 75 | 0.37 | 8 | 2,448 |
| Portable Gen Sets | 2 | 24 | 50 | 0.74 | 104 | 31,329 |
| **Subtotal Diesel Fuel** | | | | | **313** | **93,980** |
| Truck Haul Trips (on-site) | 67 | Miles/Trip 52 | MPG 6 | --- | 16.75 | 5,025 |
| Truck Haul Trips (off-site) | 67 | 1.5 | 6 | --- | 469 | 140,700 |
| Misc. Veh. Trips (on-site) | 2 | 1.5 | 7.4 | --- | 0.4 | 122 |
| Misc. Veh. Trips (off-site) | 2 | 42 | 7.4 | --- | 11.35 | 3,405 |
| **Total Diesel Fuel Usage** | **---** | **---** | **---** | **---** | **---** | **243,232** |
| **Employee Trips - Gasoline** | **10** | **Miles/Trip 52** | **MPG 24** | **---** | **21.7** | **6,500** |

1 – 300 operational days/year

**Sources: See Appendix A**

- Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors in gallons per horsepower-hour: HP: 0 to 100 =0.059. HP: Greater than 100 = 0.0529.
United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

- Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policy information/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data Last updated 02/11/2020

- CAT Performance Handbook Edition 48, June 2018.

- CalEEMod Load Factors in Appendix D, October 2017.

### 4.3 Reclamation Fuel Usage

Upon completion of mining, all disturbed slopes will be reclaimed and revegetated as outlined in the Reclamation Plan. Reclamation activities would occur within a one-year period after the completion of mining. An estimated 80 days of grading and earthmoving similar to mining operations except for off-site truck hauling are expected. The equipment types and hours of operations are included in Table 4 and detailed in Appendix A Table E3.

**Table 4**
**Reclamation Equipment Fuel Usage**

| Reclamation Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year[1] (gallons) |
|---|---|---|---|---|---|---|
| Backhoe | 1 | 8 | 100 | 0.37 | 17 | 1,253 |
| Loader | 1 | 8 | 369 | 0.42 | 66 | 5,247 |
| Grader | 1 | 8 | 268 | 0.41 | 47 | 3,720 |
| Dozer (D8) | 1 | 8 | 347 | 0.40 | 59 | 4,699 |
| Water Truck | 1 | 8 | 260 | 0.38 | 42 | 3,345 |
| Dump Truck | 1 | 8 | 260 | 0.38 | 42 | 3,345 |
| **Total Diesel Fuel** | | | | | **272** | **21,609** |
| **Employee Trips - Gasoline** | **10** | **Miles/Trip 52** | **MPG 24** | **---** | **21.7** | **1,733** |

1 – 80 operational days/ one year only.

**Sources: See Appendix A**

- Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors in gallons per horsepower-hour: HP: 0 to 100 =0.059. HP: Greater than 100 = 0.0529.
United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

- Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policy information/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data Last updated 02/11/2020

- CAT Performance Handbook Edition 48, June 2018.

- CalEEMod Load Factors in Appendix D, October 2017.

### 4.4 Electricity and Natural Gas Use

There is no processing plant equipment proposed on-site; therefore no commercial electricity or natural gas will be consumed.

## 5.0 POTENTIAL PROJECT IMPACTS

### 5.1 Thresholds of Significance

A project would have a significant energy impact on the environment if it would:

a) Result in potentially significant impact due to waste, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

## 5.2 Project Energy Evaluation

*a) Would the project result in potentially significant impact due to waste, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

Energy use would all be fuel consumption to operate heavy equipment, haul trucks, light-duty vehicles, and small generators during road construction of the access road. initial grading and mining operations, and reclamation. The proposed project will not have any on-site processing equipment. The anticipated energy consumption from equipment, trucks, and vehicles, including worker trips to and from the project site, for construction of the access road, mining operations, and reclamation is summarized in Table 5.

**Table 5**
**Estimated Annual Fuel Consumption**

| Phase | Days of Operation | Gas Used (gallons/year) | Diesel Used (gallons/year) |
|---|---|---|---|
| Construction Phase (one time) | 42 | 910 | 8,038 |
| Operational Phase (annually for 30 yrs.) | 300 | 6,500 | 243,232 |
| Reclamation Phase (16 weeks; one time) | 80 | 1,733 | 21,609 |

In comparison to the project's estimated usage of about 243,232 gallons of diesel fuel per year, Kern County had retail sales of diesel fuel of about 105 million gallons in 2019 with a state-wide total of taxable diesel fuel usage of over 3.14 billion gallons in 2019 (California Energy Commission 2019 Annual Report (CEC-A15; September 2020). The CEC estimates that retail sales account for about 47.2% of the total diesel sales; 52.8% is non-retail sales. Therefore total diesel sales in Kern County are estimated to be around 210 million gallons/year and 6.6 billion gallons/year statewide.

Energy use would be typical of similar-sized long-term construction projects in the region. In the interest of cost efficiency, operations are not anticipated to utilize fuel in a manner that is wasteful or unnecessary. In addition, all off-road and on-road equipment and trucks will meet CalPortland's fleet averaging requirements and compliance with Eastern Kern County Air Pollution Control District KAPCD rules and CARB's Off-Road Diesel Vehicle regulations.

Since the proposed project will not utilize commercial electrical power or natural gas, the project will have no impact on the electrical grid demand or on natural gas utilities. The isolated site location precludes the use of mass transportation for employees. In addition, alternate energy sources would not be feasible for the mining and truck equipment

Therefore, the project would result in a less than significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction and operation.

*b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

The Gem Hill pozzolans will act as a carbon reduction operation, an important element to reduce energy consumption and GHG emissions. Pozzolanic materials react in a synergistic way with portland cement and thus can be utilized to replace a portion of clinker and portland cement used in the manufacturing of portland cement as well as a portion of portland cement in ready-mix concrete. The utilization of Gem Hill pozzolan will reduce the carbon footprint (GHG) of cement and concrete production as an ingredient in concrete. Concrete plays an important role in achieving Building Energy Efficiency Standards as a necessary construction material and the project thus actively promotes the state's plan for energy efficiency.

The project would not conflict with or obstruct the State plan for renewable energy and would result in a less than significant impact.

## 6.0 MEASURES TO CONSERVE ENERGY USE

The U.S. Department of Energy lists strategies to conserve fuel (https://afdc.energy.gov/conserve/). These include the following:

- Idle Reduction
- Driving Behavior – speed limit
- Outfitting equipment to save fuel – use rightsized equipment for job
- Fleet rightsizing – use fuel efficient fleet
- Vehicle maintenance – maintain equipment for efficient fuel usage
- Transportation system efficiency – reduce vehicle miles

The following measures related to the above are implemented by CalPortland on its mining and industrial sites. These measures will aid in reducing the consumption of fuel and reduce costs for the mining equipment and trucks for the proposed project:

- Trucks in loading queues will have their engines turned off when not in use for more than 5 minutes to reduce idling and vehicle emissions in compliance with Title 13, California Code of Regulations, Section 2485 (Anti-Idling Policy).
- Operators and truck drivers undergo Company training with respect to operation of vehicles;
- CalPortland's equipment and trucks will meet CalPortland's fleet averaging requirements;
- Haul trucks and diesel equipment will be maintained to optimize fuel consumption.
- Haul trucks and diesel equipment will be in compliance with applicable EKAPCD rules and CARB's Off-Road Diesel Vehicle regulations;

- Vehicle speeds will be limited on-site to 15 mph;
- Trucks will be loaded and weighed to meet the California Vehicle Code; and
- Production shall be scheduled to minimize daily equipment operations and idling equipment and trucks.

## 7.0 REFERENCES


California Energy Commission. *2019 California Annual Retail Fuel Outlet Report Results (CEC-A15)*. Energy Assessments Division, 09-22-20.

CalPortland Company & Lilburn Corporation. *Reclamation Plan for the Gem Hill Quarry. Updated January 2021.*

Lilburn Corporation. *Air Quality and Greenhouse Gas Assessment for the Gem Hill Quarry*. Updated January 2021.

United States Department of Energy. *Average Fuel Economy by Major Vehicle Category. https://afdc.energy.gov/data/*

U.S. Dept. of Energy. *Strategies to Conserve Fuel.* https://afdc.energy.gov/conserve/

U.S. Energy Information Administration (EIA). April 2019. https://www.eia.gov/todayinenergy/detail.php?id=39092

Urban Crossroads. *Trip Generation Assessment*. June 2020.

## Table E1 - Gem Hill Roads & Basins Construction Fuel Usage

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

| | | | |
|---|---|---|---|
| HP: 0 to 100 | 0.059 | HP: Greater than 100 | 0.0529 |

Values above are expressed in gallons per horsepower-hour/BSFC.

**CONSTRUCTION EQUIPMENT**

| Construction Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year (gallons) |
|---|---|---|---|---|---|---|
| Backhoe | 1 | 4 | 100 | 0.37 | 8 | 329 |
| Soil Compactor | 1 | 4 | 172 | 0.42 | 15 | 642 |
| Grader | 1 | 6 | 268 | 0.41 | 35 | 1,465 |
| Dozer (D8) | 1 | 6 | 347 | 0.40 | 44 | 1,850 |
| Water Truck | 1 | 6 | 260 | 0.38 | 31 | 1,317 |
| Dump Truck | 1 | 4 | 260 | 0.38 | 21 | 878 |
| Excavator | 1 | 6 | 172 | 0.38 | 21 | 968 |
| | | | | | | 0 |
| **Total Fuel** | | | | | 175 | **7,450** |

| Roads & Basins Construction | Days of Construction |
|---|---|
| Construction | 42 |

**Sources:**

**[1]** United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

**[2]** Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policyinformation/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data Last updated 02/11/2020

## Table E2 - Gem Hill Operational Fuel Usage

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

| | | | |
|---|---|---|---|
| HP: 0 to 100 | 0.059 | HP: Greater than 100 | 0.0529 |

Values above are expressed in gallons per horsepower-hour/BSFC.

**MINING EQUIPMENT**

| Mining Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year (gallons) |
|---|---|---|---|---|---|---|
| Loader | 1 | 10 | 369 | 0.36 | 70.3 | 21,081.7 |
| Excavator | 1 | 2.5 | 172 | 0.38 | 8.6 | 2,593.2 |
| Grader | 1 | 2 | 268 | 0.41 | 11.6 | 3,487.6 |
| Dozer | 1 | 5 | 347 | 0.40 | 36.7 | 11,013.8 |
| Water Truck | 1 | 10 | 260 | 0.38 | 52.3 | 15,679.6 |
| Bore/Drill Rig | 1 | 5 | 160 | 0.50 | 21.2 | 6,348.0 |
| Skid Steer Loader | 1 | 5 | 75 | 0.37 | 8.2 | 2,447.6 |
| Portable Gen Sets | 2 | 24 | 50 | 0.74 | 104.4 | 31,328.6 |
| **Total Fuel** | | | | | **313.3** | **93,980.0** |

| Operational Phase | Days of Operation |
|---|---|
| Operational | 300 |

**Sources:**

**[1]** United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

## Table E3 - Gem Hill Reclamation Fuel Usage

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

| | | | |
|---|---|---|---|
| HP: 0 to 100 | 0.059 | HP: Greater than 100 | 0.0529 |

Values above are expressed in gallons per horsepower-hour/BSFC.

**RECLAMATION EQUIPMENT**

| Reclamation Equipment | # | Hours per Day | Horsepower | Load Factor | Fuel Used / Day (gallons) | Fuel Used / Year (gallons) |
|---|---|---|---|---|---|---|
| Backhoe | 1 | 8 | 100 | 0.37 | 17 | 1,253 |
| Loader | 1 | 8 | 369 | 0.42 | 66 | 5,247 |
| Grader | 1 | 8 | 268 | 0.41 | 47 | 3,720 |
| Dozer (D8) | 1 | 8 | 347 | 0.40 | 59 | 4,699 |
| Water Truck | 1 | 8 | 260 | 0.38 | 42 | 3,345 |
| Dump Truck | 1 | 8 | 260 | 0.38 | 42 | 3,345 |
| | | | | | 0 | 0 |
| | | | | | | 0 |
| **Total Fuel** | | | | | 272 | **21,609** |

| Reclamation | Days of Reclamation |
|---|---|
| Reclamation | 80 |

**Sources:**

**[1]** United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

**[2]** Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policyinformation/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data Last updated 02/11/2020

| TABLE E4 - WORKER & TRUCK TRIPS | | | | | |
|---|---|---|---|---|---|
| Operational Phase | MPG [2] | Trips | Trip Length (miles) | Fuel Used (gallons/day) | Total (gallons/yr) |
| Employee Trips | 24.0 | 10 | 52.0 | 21.67 | 6,500 |
| Construction Trips | 24.0 | 10 | 52.0 | 21.67 | 910 |
| Reclamation Trips | 24.0 | 10 | 52.0 | 21.67 | 1,733 |
| | | | | | |
| | | | | | |
| | | | **Total** | 65.00 | **9,143** |

| TABLE E5 - On-Road Haul Trucks & Misc. Vehicles | | | | | |
|---|---|---|---|---|---|
| Operational Phase | MPG [2] | Trips | Trip Length (miles) | Fuel Used (gallons/day) | Total (gallons/yr) |
| Haul Trucks (onsite) | 6.0 | 67 | 1.5 | 16.75 | 5,025 |
| Misc. Vehicles (onsite) | 7.4 | 2 | 1.5 | 0.41 | 122 |
| Haul Trucks (offsite) | 6.0 | 67 | 42.0 | 469.00 | 140,700 |
| Misc. Vehicles (offsite) | 7.4 | 2 | 42.0 | 11.35 | 3,405 |
| | | | | | |
| | | | **Total** | 497.51 | **149,252** |
| Construction Phase | 6.0 | 2 | 42.0 | 14.00 | 588 |

| TABLE E6 - TOTAL ANNUAL FUEL CONSUMPTION | | | |
|---|---|---|---|
| Phase | Days of Operation | Gas Used (gal/yr) | Diesel Used (gal/yr) |
| Construction Phase | 42 | 910 | 8,038 |
| Operational Phase | 300 | 6,500 | 243,232 |
| Reclamation Phase (16 weeks est.) | 80 | 1,733 | 21,609 |

**Sources:**

**[1]** United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonrod Compression-Ignition Engines in MOVES2014b.* July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

**[2]** Federal Highway Administration. Highway Statistics 2018, Table VM-1. Accessed 02/11/20 at fhwa.dot.gov/policyinformation/statistics/2018/pdf/vm1.pdf: Worksheet available at afdc.energy.gov/data

CAT Perfomance Handbook Edition 48, June 2018.

CalEEMod Load Factors Appendix D October 2017.

Appendix G

# Geotechnical Engineering, Soil, and Paleontological Resources Reports

Appendix G.1

# Slope Stability Evaluation Report, Proposed Gem Hill Pozzolan Quarry-North Pit

# Slope Stability Evaluation Report

**Proposed Gem Hill Pozzolan Quarry – North Pit**
**Rosamond Hills, Kern County, California**
February 10, 2022
Terracon Project No. CB195156

**Prepared for:**
CalPortland Company
Glendora, California

**Prepared by:**
Terracon Consultants, Inc.
Colton, California

February 10, 2022

CalPortland Company
2025 E. Financial Way
Glendora, California 91741

Attn: Ms. Desirea Haggard – Director of Environmental Affairs
P: (626) 629 9366
E: dhaggard@calportland.com

Re: Slope Stability Evaluation Report (2022 revision)
Proposed Gem Hill Pozzolan Quarry – North Pit
Mojave Tropico Road, North of Sweetser Road
Rosamond Hills, Kern County, California
Terracon Project No. CB195156

Dear Ms. Haggard:

We have completed the revisions to the Slope Stability Evaluation report for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PCB195156 dated November 22, 2019. This revised report includes material to address peer review comments and presents the findings of our data review, geologic mapping, laboratory testing, and structural evaluation and provides recommendations concerning suitable slope angles for the reclamation of the project consistent with Surface Mining and Reclamation Act (SMARA) requirements.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
**Terracon Consultants, Inc.**

John S. McKeown, C.E.G. 2396
Senior Geologist




Jay J. Martin, C.E.G.1529
Principal Geologist



## REPORT TOPICS

INTRODUCTION ..... 1
SCOPE OF SERVICES ..... 1
PRIOR INVESTIGATIONS ..... 2
SITE DESCRIPTION ..... 2
RECLAMATION PLAN SUMMARY ..... 3
FIELD INVESTIGATION ..... 3
SITE GEOLOGY ..... 4
SEISMIC CONSIDERATIONS ..... 5
GROUNDWATER ..... 6
SLOPE STABILITY ..... 6
FINDINGS AND CONCLUSIONS ..... 11
GENERAL COMMENTS ..... 14

**Note:** This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

## ATTACHMENTS

SITE LOCATION MAP
GEOLOGIC MAP
CROSS SECTIONS
KINEMATIC DATA
GLOBAL STABILITY CALCULATIONS
PHOTOGRAPHY LOG
DRILL HOLE LOGS

**Note:** Refer to each individual Attachment for a listing of contents.

# Slope Stability Evaluation Report

## Proposed Gem Hill Pozzolan Quarry – North Pit
## Mojave Tropico Road, North of Sweetser Road
## Rosamond Hills, Kern County, California

**Terracon Project No. CB195156**

**February 10, 2022**

## INTRODUCTION

This firm has prepared a revised slope stability investigation for slope reclamation for the CalPortland Gem Hill Pozzolan Quarry in Kern County, California. This revised report includes material to address peer review comments. A reclamation plan dated October 9, 2020 was provided with an updated configuration. The mine is proposed to be developed in the North Pit area that is located in volcanic tuff and welded tuff units. Our services included geologic mapping and data collection, sampling and testing of rock samples, and evaluation of kinematic and global slope stability for proposed rock and fill slopes as outlined in our proposal dated November 22, 2019. The purpose of our evaluation was to characterize the anticipated stability conditions of proposed reclamation slopes in the North Pit and a stockpile area of the mine site. Information from prior investigators and documents provided was also utilized for this evaluation.

The approximate location of the project area is shown on the attached **Site Location** map. The results of our evaluation, together with our conclusions and recommendations, are presented in this report.

## SCOPE OF SERVICES

We performed a slope stability investigation to address the proposed reclaimed slope configurations to be formed in the various volcanic rock units and stockpile fill materials and provide recommendations for required stable slopes according to Surface Mining Reclamation Act (SMARA). Planned slope configurations were provided in a plan dated October 9, 2020. A geology map and sections prepared by Mr. Nicholas Van Buer (2019) was provided for our use. Aerial photographs and data from prior mapping studies were examined. We utilized pertinent data from drilling reports and investigations as appropriate.

We established the strength characteristics of rock and stockpile materials based on our database of UCS tests, laboratory testing and slope stability application-based utilities.

We performed kinematic evaluation of characteristic geologic structure using stereonet plots and screening criteria to identify potential for various failure modes.

We also performed whole-slope global stability analyses of the tallest rock and stockpile slope configurations (representative) for static and seismic conditions in the proposed slope areas.

Stockpile materials strengths were estimated from our experience with similar materials.

The results of mapping and analysis, our findings of suitability of the proposed slope configurations, and recommendations for modifications of slope geometry, where warranted by analytical results, are presented in this report.

## PRIOR INVESTIGATIONS

A map by Van Buer (2019) was provided for our use and summarizes geologic mapping of the mine area with an emphasis on the volcanic tuff units and alluvium cover. Van Buer recognized the presence of southwest-dipping tuff beds and several faults and inferred faults within future pit area.

Dibblee mapped the Rosamond Hills region as documented in maps dated 1959 and 1962. He indicated several volcanic units within the mine area as Gem Hill formation including tuff, tuff-breccia and tuffaceous sandstone and basalt. Dibblee includes a cross section that depicts the Gem Hill area showing tuff beds overlying quartz monzonite in several down-to-the-northwest fault blocks formed between east-southeast striking normal faults. Dibblee provides a summary description of the lithology, mode and timing of emplacement of the Gem Hill volcanics during Tertiary time.

The nomenclature of geologic units designated by Van Buer was adapted for this investigation. A Geologic Map and Site Plan is included in **Attachments**.

An exploration program was conducted in the quarry area by CalPortland utilizing 15 downhole hammer (air track) borings. These data and associated cross sections were provided for our use. Drill data in tabular format are included in **Attachments**.

## SITE DESCRIPTION

The future Gem Hill Quarry is located in Kern County northwest of the community of Rosamond in the western Mojave Desert region. The site is generally located in an area of moderate to steep relief formed within a series of resistant and recessive volcanic tuffs and welded tuffs locally mantled by young colluvial and alluvial sediments and cobble lag (see photography log in **Attachments**). The Mojave Desert is dominated by broad alluviated basins that receive sediments from adjacent uplands that bury the older topography. Hills and playa lakes are a common feature of the region including Rosamond Lake to the southeast. Bedrock units in the project area include basalt, tuff, conglomerate and minor limestone. These units are exposed in natural outcrops formed by erosion and dissection of gently southwest dipping bedding (see photography log in **Attachments**). A description of geologic units in the quarry area is provided in a later section of this report.

# RECLAMATION PLAN SUMMARY

CalPortland Cement Company (CalPortland) is planning on developing a mine and reclamation plan within a 189-acre project site located on lands owned by CalPortland. The site is located in the Antelope Valley approximately 9 miles southwest of the town of Mojave and 3 miles west of State Route 14 within Kern County, California. Mining will extract pozzolan, a type of volcanic material that can be used as a partial replacement for cement. Pozzolan is defined as a cementitious material that increases the long-term strength and other material properties of Portland cement concrete and reduces the air emissions of carbon dioxide ($CO_2$), a contributor to global warming or climate change, in the production of cement.

According to the reclamation plan, final reclaimed quarry slopes have planned bench faces 25 feet tall with 16-foot-wide benches, yielding an overall slope angle of approximately 45 degrees. Benched slope heights in rock up to 375 feet are proposed. Stockpile slope heights to approximately 110 feet tall at a slope ratio of 2(horizontal) to 1 (vertical) are planned for overburden placement.

# FIELD INVESTIGATION

## Field Exploration

A Certified Engineering Geologist mapped existing geologic features as exposed in native outcrop in the reclamation area during December 2019. This included measuring the orientation of geologic contacts and structures including faults, bedding, and joint orientations using a Brunton compass. These data were recorded on a paper log and locations noted on a topographic map. Our focus was on continuous features that can affect kinematic stability of quarry slope faces and wall-scale faults and contacts. We included structural data from prior mapping and evaluation of joints visible in aerial imagery in the kinematic data set as appropriate. A Geologic Map and Site Plan, adapted from mapping by others, is attached. Geologic structural mapping areas referred to herein are numbered and indicated on the attached Geologic Map and Site Plan.

### Laboratory Testing

An Unconfined Compressive Strength (UCS) test was performed on a rock core obtained from a large sample of tuff material collected from the site. The tuff sample is a surface block approximately 14-inches in size yielding a cored length of approximately 10 inches. A 5-inch test sample was cut from this core. The sampled material is representative of near surface, weathered tuff as it was derived from a near-outcrop location. Results of the UCS test are summarized below.

| Specific Gravity | Density (lb/ft.3) | UCS | |
|---|---|---|---|
| | | PSI | Kips |
| 2.02 | 126 | 2750 | $3.96 \times 10^5$ |

## SITE GEOLOGY

Geologic units within the reclamation area include alluvium, colluvium, welded tuff and tuff volcanic rocks, conglomerate and basalt. The units summarized below form the primary geologic materials in the quarry area and adjacent areas.

### Geologic Units

**Qa** – Alluvium on areas of low relief. Derived from local highland sources, includes silt, sand and gravel materials, commonly with areas of accumulated surface cobbles along shallow ephemeral drainages. The thickness of alluvium is relatively minor across the site. At the time of our site visit in December 2019, the alluvium contained sufficient moisture to support surface water flows in ephemeral drainages.

**Qc** – Colluvium adjacent to areas of higher relief derived from adjacent bedrock outcrops, gravity deposited. A significant source includes clasts eroded from containing tuff and welded tuff units that accumulate as surface lag on modern land surfaces. Colluvium includes silt, sand and gravel size materials and locally accumulations of cobble to small boulders as surface lag deposits.

**Tb** – Basalt, fine-grained and vesicular, crops out locally west of North Pit forming dark brown, blocky outcrops of angular boulder size materials, locally with an associated celadonite (blue-green) alteration zone in adjacent tuff beds with some whiteish perlite rinds. Interpreted as dikes fed from underlying basalts encountered in drill holes. Dibblee (1959) includes **Tb** as part of Gem Hill formation.

**Tt** $_{3,4,5}$ – Tuff units as designated by Van Buer (2019). Include lithic tuff beds with local lenses of angular rhyolite and andesite gravel clasts, beds vary from inch-scale to several feet thick, includes minor zones of laminated ash, gray as moderately indurated; brown to dark brown as strongly welded, clastic conglomerate. Strong erosion-resistant beds of welded tuff contain

abundant granitic cobbles and small boulders with lesser andesite fragments (Mapped by Van Buer as unit **Tgc**). Locally these granitic-clast-rich beds form undulatory or channeled scour contacts on underlying tuff units (see photography log in **Attachments**). Welded beds form resistant dip slopes. Weaker recessive and massive tuff beds dominate the sequence and are gray to light gray, composed of angular sand-size grains, and weather as small sheets spalling from exposed outcrop faces (see photography log in **Attachments**). These tuffs are the primary resource to be mined. Dibblee (1959) includes **Tt** as part of Gem Hill formation.

### Geologic Structure

The mine reclamation area includes geologic units of Tertiary age and geologically young surface sediments. Structural elements within the rock units are dominated by well-defined and consistent bedding and include joints and inactive faults. At the mine bench scale, the primary influence on stability of rock material is anticipated to be jointing oriented parallel to future bench faces coupled locally with faults and/or joints oriented perpendicular to bench faces. At the mine wall scale, the larger-scale fault and thrust structures influenced locally by bedding provide the primary structure. Bench-scale features were examined in the field at selected locations and compiled into a database for kinematic evaluation. Major elements of the wall-scale structure include:

- East-west oriented mapped faults in the southern portion of the North Pit area
- A northwest-trending, concealed and inferred fault separating the northeast and southwest pit areas. This fault is depicted as northeast-dipping (60 degrees) on structural sections constructed from bore-hole data.
- Southwest-dipping bedding that is relatively uniform throughout the mine footprint with measured dips varying between 14 and 19 degrees (see photography log in **Attachments**)
- North-dipping minor faults observed in outcrops located in the northeast and southwest areas of the quarry footprint

Consideration of the dominant geologic structures was included in the slope stability cross sections for consideration of the effect on global stability.

## SEISMIC CONSIDERATIONS

The ground-shaking hazard at the site was evaluated from a deterministic standpoint for use as a guide to formulate an appropriate seismic coefficient for use in slope stability analysis. The deterministic calculation of peak ground acceleration (PGA) was made using attenuation relations of Abrahamson and others (2014), Boore and others (2014), Campbell and Bozorgnia (2014) and Chiou and Youngs (2014). For the San Andreas fault with a magnitude of 8.2 at a distance of 33 kilometers, the estimated PGA is 0.37g. The Garlock fault, with a magnitude of 7.72 at a distance of 20 kilometers, yields a PGA of 0.38g.

The simplified procedure of Bray and Travasarou (2009) for selection of critical acceleration (Kh) as one-half PGA is commonly used for slope stability calculations for habitable structures. Their method is not typically required or applicable for quarry slope design. Given the project location in an area of moderate to high seismic potential, we used Kh = 0.18, consistent with Bray and Travasarou (2007), to approximate one-half the value of PGA from the deterministic calculation for the closest fault.

## GROUNDWATER

Groundwater measurements were recorded by others for several drill holes within the future mine area. As reported to us via electronic mail, water was reported for borehole R12 and R13 at a depth of approximately 250 feet bgs in basalt. Water was encountered in borehole R19 at 350 feet bgs and at deeper depths in basalt. Borehole R2 and R16 encountered water at depths of 660 feet bgs and 440 feet bgs in basalt. The shallowest water reported was in boreholes located south of the South Fault with water at approximately 200 feet bgs in tuff. All of the borehole measurements indicated water at elevations below the planned pit bottom elevation at 2,450 feet amsl. Therefore, static groundwater is not anticipated to occur in the pit. The project is located in an arid region subject to low precipitation and low potential for saturation of pit slopes and of stockpile materials due to planned stormwater management basins and surface drainage improvements. The potential for saturation of the overburden or soils stockpiles is very low.

Groundwater conditions at completion of mining (reclamation stage) may include water seepage and ponding of limited extent. Groundwater is not anticipated to significantly affect the stability of the proposed reclamation slopes. Our evaluation considered dry conditions in the slope stability calculations.

## SLOPE STABILITY

Slope stability calculations of proposed reclamation slopes and kinematic analysis of potential failure geometries in rock benches were performed for the future quarry. The kinematic data include the measured geologic structures and pertinent data from prior investigations and mapping. Global slope stability was evaluated along cross sections representing the tallest and steepest proposed slopes with consideration of the various geologic units and structures as they potentially affect the wall-scale stability. A discussion and summary of these analyses are presented below. The slope stability data and calculations are attached.

### Kinematic Analysis

Kinematic analysis involves the evaluation of rock slope stability based on the presence of structural discontinuities including bedding planes, joints, and faults. Kinematic analysis addresses only the potential failure mode(s) and does not consider mass, force, shear strength,

or cohesion along surfaces as in a limit-equilibrium analysis. Structurally controlled kinematic failure modes include planar, wedge, and topple failures. Circular failure of fractured rock masses is also a potential failure mode and is considered in the analysis of global stability.

Stereonet analysis (Rocscience, 2018a) for representative slope/bench aspects was performed utilizing the data compiled from mapping and measurement of geologic structures. The proposed maximum bench face angle (70 degrees) was evaluated for various slope facing directions (azimuth) shown on the reclamation plan. Planned reclaimed slope orientations vary within the planned quarry but generally are oriented as north-, east-, south- and west-facing highwalls. Stereonet diagrams are presented using a north-facing aspect for the model slope; however, a continuum of orientations was evaluated using the stereonet software sensitivity analysis capability.

Planar analysis considers dip vectors of measured planar features. Planar sliding requires a releasing surface—a joint, tension crack or daylighted plane—to allow sliding to occur. Kinematic analysis does not consider the geometry of releasing surfaces or the presence of bonded contacts along the sliding plane; therefore, actual conditions are typically more stable than suggested by kinematic results. The potential for planar sliding or wedge failure suggested by stereonet analysis should be considered a conservative estimate of probability subject to mitigation by mining practices such as scaling and adjustment of slope face angles to the structural geometry and conditions encountered during mining. Wedge analysis generates dip vectors for the intersections of all planes; therefore, wedge analysis generates a large number of vectors to evaluate. Topple analysis identifies the potential for columns to form along steeply dipping joint systems or contacts to tilt out of the excavated face along separation surfaces. The stereonet data plots are attached.

**Table 1: Summary of Kinematic Evaluation—Gem Hill North**

| Azimuth | Percentage Critical Points – 71-Degree Face | | |
|---|---|---|---|
| (degrees) | Planar | Wedge | Topple (direct) |
| 000 | 8.5 | 13.9 | 11.3 |
| 090 | 0 | 3.5 | 8.5 |
| 180 | 0 | 2.5 | 19.7 |
| 270 | 0 | 15.1 | 2.8 |
| 350 | 9.9 | -- | -- |
| 335 | -- | 25.2 | -- |
| 035 | -- | -- | 18.3 |

Stereonet diagrams are provided for slope directions with highest relative kinematic failure potential for each mode and for the four major slope directions (north, east, south and west). Sensitivity Analysis charts of slope dip direction versus percentage critical points are also provided.

The stereonet evaluation provides results as a percentage of points in a data set with a geometrically feasible orientation to undergo a particular failure mode. In general, the percentage value relates to probability of a particular failure mode. Probabilities below 8 percent suggest low failure potential, 8 percent to 25 percent a low to moderate potential, and values above 25 percent (blue shading) a moderate or higher potential.

For the North Pit reclamation area, the kinematic evaluation suggests low potential for planar failure, moderate potential for wedge failure, and low to moderate potential for topple in the planned slopes.

The highest relative potential for planar failures is in north-facing slopes and is associated with east-west trending faults. The relatively flat-lying and uniform bedding exhibited throughout the quarry area greatly reduces or precludes a potential for bedding plane sliding. The highest relatively potential for wedge failure is in north-, west- and northwest-facing slopes associated with the intersections of joints with north-dipping faults. The relatively highest potential for topple failure is in south- and northwest-facing slopes.

An additional mode of natural kinematic failure - noted during field mapping – is undercut of recessive tuff beds and topple of overlying welded tuff beds. This process was noted along the southwest quarry margin in native outcrops that exhibit joint system aligned parallel to natural cliffs. This has resulted in deposition of large blocks near and downslope from source outcrops. (see photography log in **Attachments**) While notable as a natural process, this mode is anticipated to be mitigatable with the standard benching program utilized in rock quarries.

Based on mining practices that minimize the occurrence of hanging blocks by scaling and removal of potentially unstable localized features, the proposed final slope configuration is expected to produce a suitably configured slope geometry that mitigates rock fall for slopes in the reclaimed mine areas. The slope benching and configuration presented in the reclamation plan are considered feasible with regard to the performance of the proposed rock faces.

## Global Stability Calculations

The global stability of proposed reclamation slopes, as depicted on the reclamation plan, was analyzed using Spencer's method under both static and seismic conditions for rotational and composite failure surfaces using the SLIDE computer program, version 8.021 (Rocscience., 2018b). Selection of the slope configurations for the analysis, which includes the tallest anticipated slope, is a most-conservative approach. The whole rock strength of the geologic units was determined in part by laboratory testing of a tuff block sample, reference to our database of unconfined compressive strength (UCS) tests, and reference to a database of Generalized Hoek-Brown rock strength parameters included in the SLIDE software application.

Slope stability calculations were performed on representative slopes modeled as summarized in the following table:

| Table 2: Summary of Slope Stability Models - North Pit | | | |
|---|---|---|---|
| **Model** | **Height (feet)** | **Geologic Unit (s)** | **Angle** |
| Section A – North Wall | 375 | Tuff | 45 (overall) |
| Section B – West Wall | 315 | Tuff | 45 (overall) |
| Section A – Fault Scenario | 255 | Tuff | 56 (fault dip) |
| Section B – Bedding Condition | 260 | Tuff | 15 (bedding dip) |
| OB Stockpile | 120 | Mixed basalt OB | 27 |

Strength parameters for the tuff units were modeled with the Generalized Hoek-Brown criteria (Hoek and Karzulovic, 2000 and Hoek, Carranza-Torres & Corkum, 2002), using the results of UCS tests on sampled rock materials and the SLIDE program's integrated calculator application. The strength of the intact block sample is a guideline for selection of Hoek-Brown strengths used with the slope stability program SLIDE (Rocscience). The SLIDE program includes values for Geologic Strength Index (GSI), intact rock constant (mi), and disturbance factor (D) in addition to the Unconfined Compressive Strength (UCS) value that account for the rock mass quality. The various parameters are selected from a tabular interface based on Structure and Surface Conditions for GSI, rock type for mi, and expected blast condition upon reclamation for disturbance factor 'D'.

The strength of stockpile fill was determined using the result of prior shear tests for similar stockpile material. The strength parameter values are presented in the following tables.

| Table 3.1: Gem Hill formation Volcanics (Tt) – Strength Parameters | | |
|---|---|---|
| | **Value** | **Source** |
| Unit Weight (pcf*) | 126 | Lab specific gravity |
| Intact UCS (psf**) | $3.96 \times 10^5$ | Lab Test |
| Geological Strength Index | 65 | Rocscience tables |
| Intact Rock Constant (mi***) | 13 | Rocscience tables |
| Disturbance Factor | 0.7 | Controlled blasting/Mechanical excavation |

* pcf = pounds per cubic foot
** psf = pounds per square foot - ASTM 7012 Method C
*** mi = unitless constant

| Table 3.2: Stockpile Fill - Strength Parameters | | |
|---|---|---|
| | **Value** | **Source** |
| Unit Weight (pcf*) | 135 | estimated |
| Cohesion (psf) | 200 | Prior Data |
| Friction Angle | 37 | |

* pcf = pounds per cubic foot
** psf = pounds per square foot

The values for stockpile material are based on knowledge of the range of typical unit weight values and Mohr Coulomb strengths for mine stockpile material, and shear test results from a basalt overburden (OB) material from a prior project in the Mojave Desert. In our opinion, the values utilized are representative of the anticipated stockpile material for this project.

The results of global slope stability analyses are summarized below. Details of stability calculations including material type boundaries, strength parameters, and the minimum factor of safety and critical slip surface are attached.

| Table 4: Summary of Global Stability Results | | | | |
|---|---|---|---|---|
| **Model** | **Materials** | **Slope Configuration** | **Static Factor of Safety** | **Seismic Factor of Safety (k=0.2)** |
| Section A North Wall | Tuff | 375 feet @ 45 deg. | 2.75 | 2.08 |
| Section B West Wall | Tuff | 315 feet @ 45 deg. | 3.07 | 2.27 |
| Section A – Fault scenario | Tuff | Fault dipping @ 56 deg. | -- | 0.72* |
| Section B – Bedding Condition | Tuff | 260 feet @ 45 deg. | -- | 1.63 |
| Overburden Stockpile | Mixed Basalt OB | 27 deg. Fill slope | 1.78 | 1.17 |

- Illustrates potential for localized bench back break along fault planes closely mimicking bench faces. Mitigatable by scaling and adjustment of wall location upon inspection

Sufficient static factors of safety (FS) in excess of 1.5 and seismic factors of safety at or greater than 1.1—in conformance with Office of Mine Reclamation (OMR) criteria—were indicated for the modeled quarry slopes and stockpile configuration. A scenario model for a bedding condition indicates suitable along bedding strength in quarry walls with daylighted bedding. A potential for

bench back break along fault planes is identified for the south wall. This potential condition is mitigatable by inspection and bench adjustment during mining/reclamation.

Project stockpiles are planned at 26.6 degrees [2(h) to 1(v) slope ratio]. Slopes at this angle are considered 'standard' fill slopes for purposes of stockpile reclamation design and are considered stable by inspection. Site materials are expected to generate granular and angular soils with gravel and cobble size particles that add a component of effective cohesion. We expect these materials to be stable under static and seismic conditions at the proposed maximum 26.6-degree [2(h) to 1(v)] slope angle.

## FINDINGS AND CONCLUSIONS

Based on our geologic field observations and results of our slope stability analysis, it is the opinion of this firm that the proposed rock and stockpile reclamation slopes are feasible with respect to slope stability from a geotechnical standpoint. Slopes formed in the tuff (Tt) unit are stable by calculation at angles near 45 degrees utilizing 375-foot-tall faces. Consideration of local fault conditions in reclamation may include modification of geometry to achieve suitable face angles and overall slope angles in this material.

The following slope heights/angles versus materials are considered feasible for reclamation:

- Rock materials including basalt and conglomerate interbeds—45 degrees up to 375 feet in height
- Overburden Stockpile (OB) fill—27 degrees up to 120 feet in height

Based on the elevation of the proposed pit bottom, groundwater is not anticipated to occur within the maximum mined depth.

Moderate to severe seismic shaking of the site can be expected to occur during the lifetime of the proposed mining and reclamation. This potential has been considered in our analyses and evaluation of slope stability.

The proposed rock slope configurations are considered suitably stable under static and seismic conditions as reclaimed slopes. Inclusion of horizontal safety benches in final slope design is an effective protection from rockfall, will reduce tensional forces in surface rock, and will reduce surface erosion rates (Highland and Brabowsky, 2008). Slopes may be protected with berms as necessary to prevent slope erosion in areas where overland flow is directed toward slopes.

The configuration of wall height, wall angle and bench width is controlled primarily by the type of mining equipment used and the geologic structure and bench face angles that can be achieved (Ryan and Pryor, 2000). Typical wall heights in hard rock mines range from 30 to 40 feet, which is above the expected range for the proposed quarry reclamation.

The rock mass within the North Pit area is generally competent and capable of forming stable slopes at the proposed slope angles for reclamation. The rock structure includes bedding and joint systems that have been characterized by mapping and analysis to yield suitably stable rock slopes. Localized structures at the bench scale may form zones that require scaling and/or excavation to flatten or steepen face angles to achieve suitable reclamation conditions. At such time and locations as reclamation slopes are excavated, a qualified professional should examine the slope conditions to determine conformance with the reclamation plan.

The area of the proposed North Pit quarry is mantled with colluvium in the northwestern portion. Adjustment of near-surface slope angles OR removal of unconsolidated surface materials will mitigate long-term raveling and erosion in this material.

Slow raveling processes during and after quarry operation, with time, may result in deposition of limited talus on benches. Talus left on the benches can facilitate revegetation and lend a more natural appearance to the reclaimed slopes. It is anticipated that rock fragments will be angular and relatively resistant to rolling. Therefore, rockfall hazard is not anticipated for properly excavated and scaled rock slopes.

Based on anticipated reclamation slope conditions, use of steel netting or other structural installations to mitigate toppling or rockfall is not considered necessary; however, these measures, as well as a berm at the toe of the final quarry slopes, may be considered if warranted by future conditions. As is typical for any surface mining location, we recommend periodic observation of mine benches for indications of potential instability above working areas during mine operations.

Visual inspection of rock excavations and reclamation slopes/benches should be performed to address the potential for unknown or newly exposed discontinuities/geologic conditions. If raveling or instability is evident due to features in the geologic structure, the bench width may be increased to provide a suitable buffer to daylighted or unstable features and a sufficient area to mitigate rockfall.

The kinematic condition associated with the interaction of localized faults and the south wall, if exposed in reclamation slopes, should be examined during annual inspections.

Production blasting and/or mechanical excavation in tuff resource may be suitable for developing mine slopes. However, when reclaimed slope faces are reached, blasting should be planned and controlled so that final catch benches are constructed in accordance with the approved reclamation plan and to avoid excess disturbance to finished surfaces. Degradation or clogging of catch benches can allow rockfall to reach lower mine levels.

Provision of terraces and/or berms to convey surface drainage away from slope faces in overburden stockpile slopes should be considered for reclamation stockpile slopes.

This report is intended to address the proposed reclamation and is not applicable to working mine (interim) slopes which may be steeper and/or of different configuration than the reclamation plan.

## GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

# REFERENCES

## Geologic References

Bray, J. D. and Travasarou, T.. 2009 Pseudostatic Coefficient for Use in Simplified Seismic Slope Stability Evaluation, J. of Geotechnical and Geoenv. Engineering, ASCE, 135(9), 1336-1340.

Bray, J. D. and Travasarou, T., 2007, Simplified Procedure for Estimating Earthquake-Induced Deviatoric Slope Displacements, Journal of Geotechnical and Geoenvironmental Engineering, v. 133, issue 4.

Dibblee, T.W., Jr., 1963, Geology of the Willow Springs and Rosamond quadrangles, California: U.S. Geological Survey Bulletin 1089-C.

California Department of Water Resources, 2019, http://www.water.ca.gov/waterdatalibrary.

Highland, L. M., and Bobrowsky, P., 2008, The Landslide Handbook – A Guide to Understanding Landslides: U.S. Geological Survey Circular 1325.

Hoek, E., and Karzulovic, A., 2000 Rock-Mass properties for surface mines. In Slope Stability in Surface Mining (Edited by W. A. Hustralid, M.K. McCarter and D.J.A. van Zyl), Littleton, CO: Society for Mining, Metallurgical and Exploration (SME), pages 59-70.

Hoek, E., Carranza-Torres, C., and Corkum, B., 2002. Hoek-Brown criterion – 2002 edition. Procedures of the. North American Rock Mechanics Symposium-Tunneling Association of Canada Conference, Toronto, 2002, 1, 267-273.

Petersen, Mark D., Frankel, Arthur D., Harmsen, Stephen C., Mueller, Charles S., Haller, Kathleen M., Wheeler, Russell L., Wesson, Robert L., Zeng, Yuehua, Boyd, Oliver S., Perkins, David M., Luco, Nicolas, Field, Edward H., Wills, Chris J., and Rukstales, Kenneth S., 2008, Documentation for the 2008 Update of the United States National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 2008–1128, 61 p.

Rocscience, Inc., 2018a, Dips computer software program, ver. 7.014: Graphical and statistical analysis of Orientation data.

Rocscience, Inc., 2018b, SLIDE computer software program, ver. 8.021: 2D Limit equilibrium slope stability for soil and rock slopes.

Ryan, T. M., and Pryor, P. R., 2000, Designing catch benches and interramp slopes, in WA Hustrulid, MK McCarter & DJA Van Zyl (eds), Slope Stability in Surface Mining, SME, Colorado, pp. 27–38.

Seed, H. B., 1979, "Considerations in the Earthquake-Resistant Design of Earth and Rockfill Dams", Geotechnique, v. 29, no. 3, pp. 215-263.

## Aerial Imagery Examined

Google Earth, 2019, web-based software application, aerial imagery dated June 1, 1994; March 3, 2004; December 31, 2004; March 31, 2008; July 15, 2011; August 25, 2012; April 11, 2015; April 29, 2017.

# ATTACHMENTS

## SITE LOCATION MAP

Proposed Gem Hill Pozzolan Quarry – North Pit ■ Rosamond Hills, Kern County, California
February 10, 2022 ■ Terracon Project No. CB195156

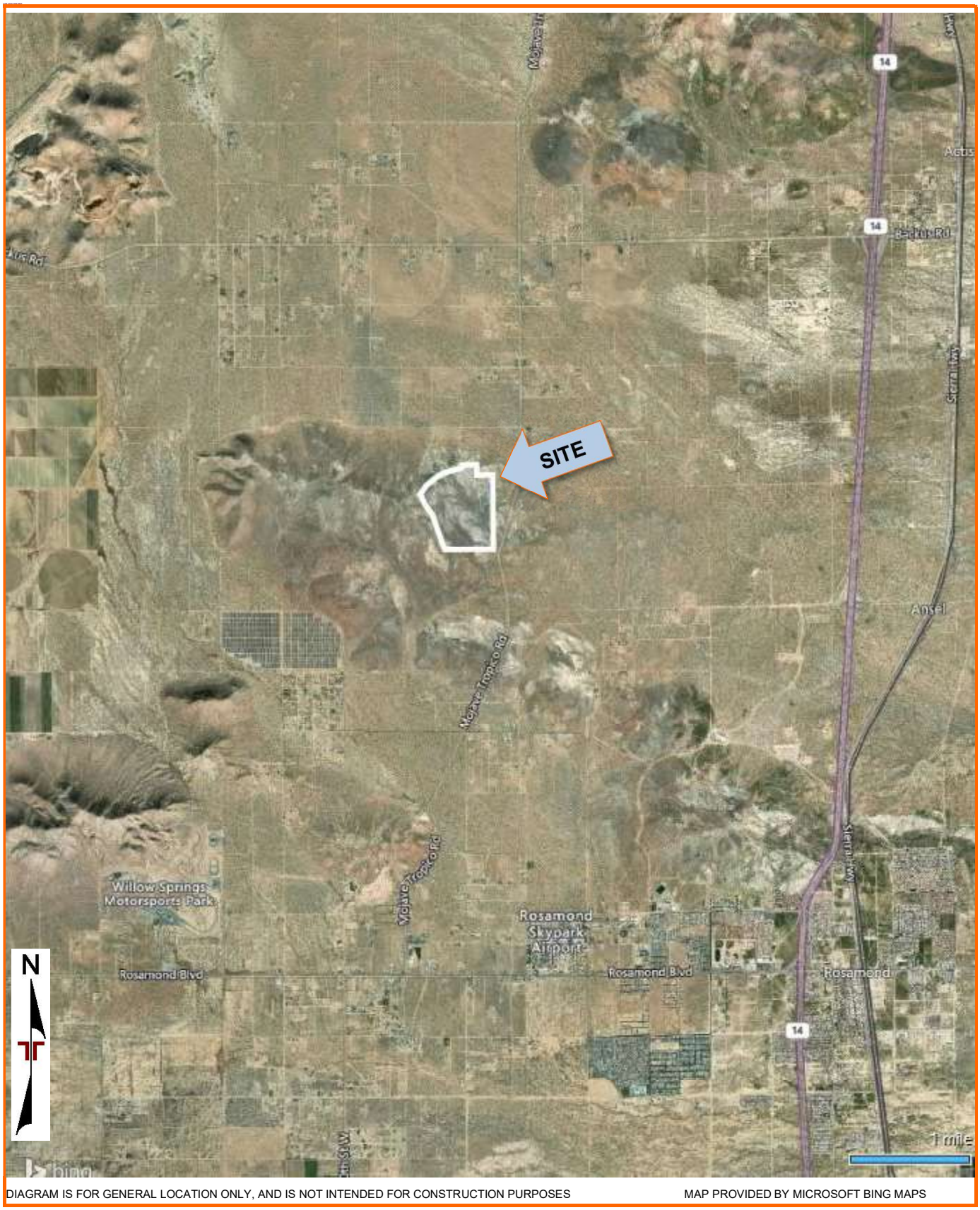
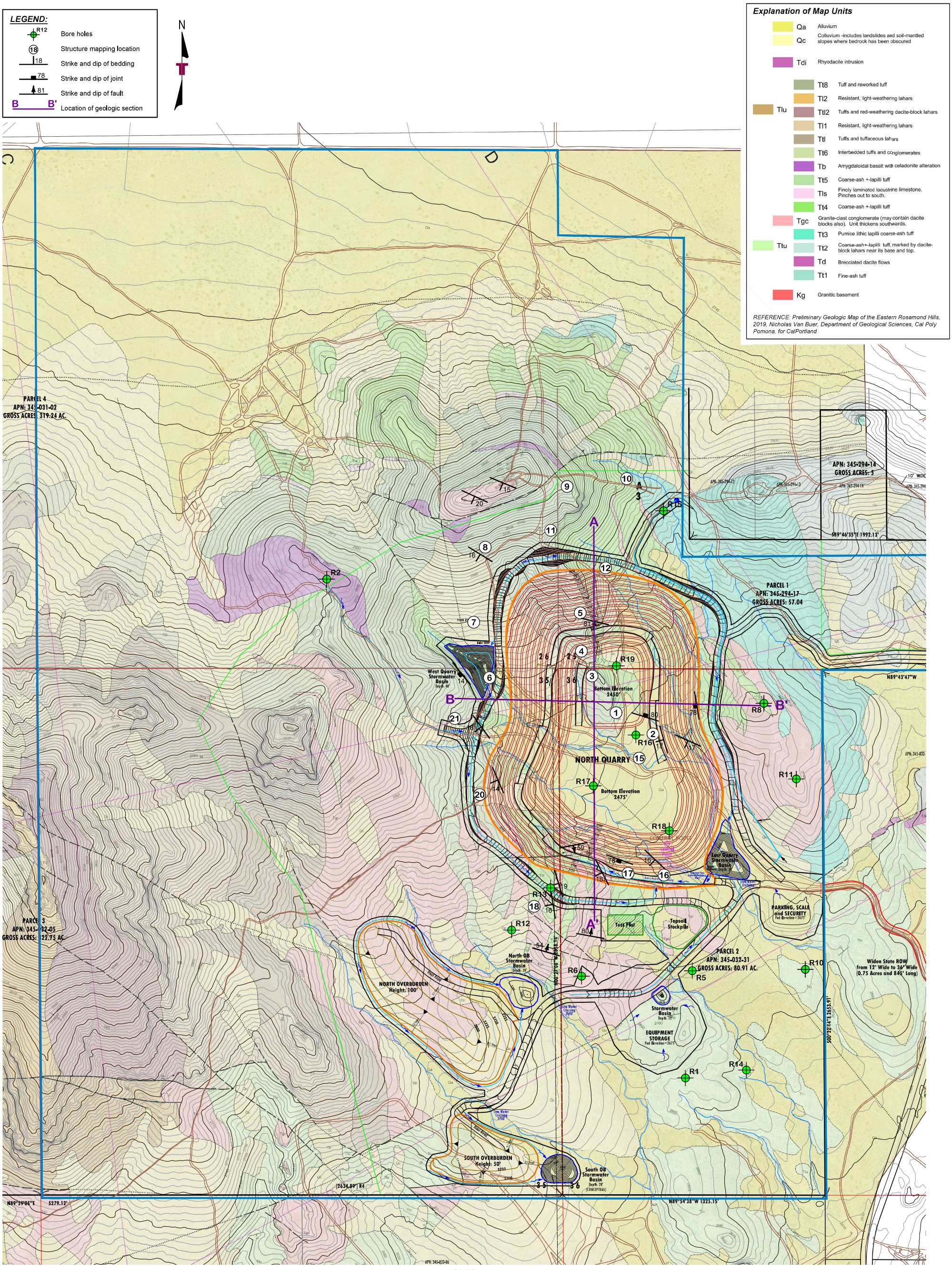



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

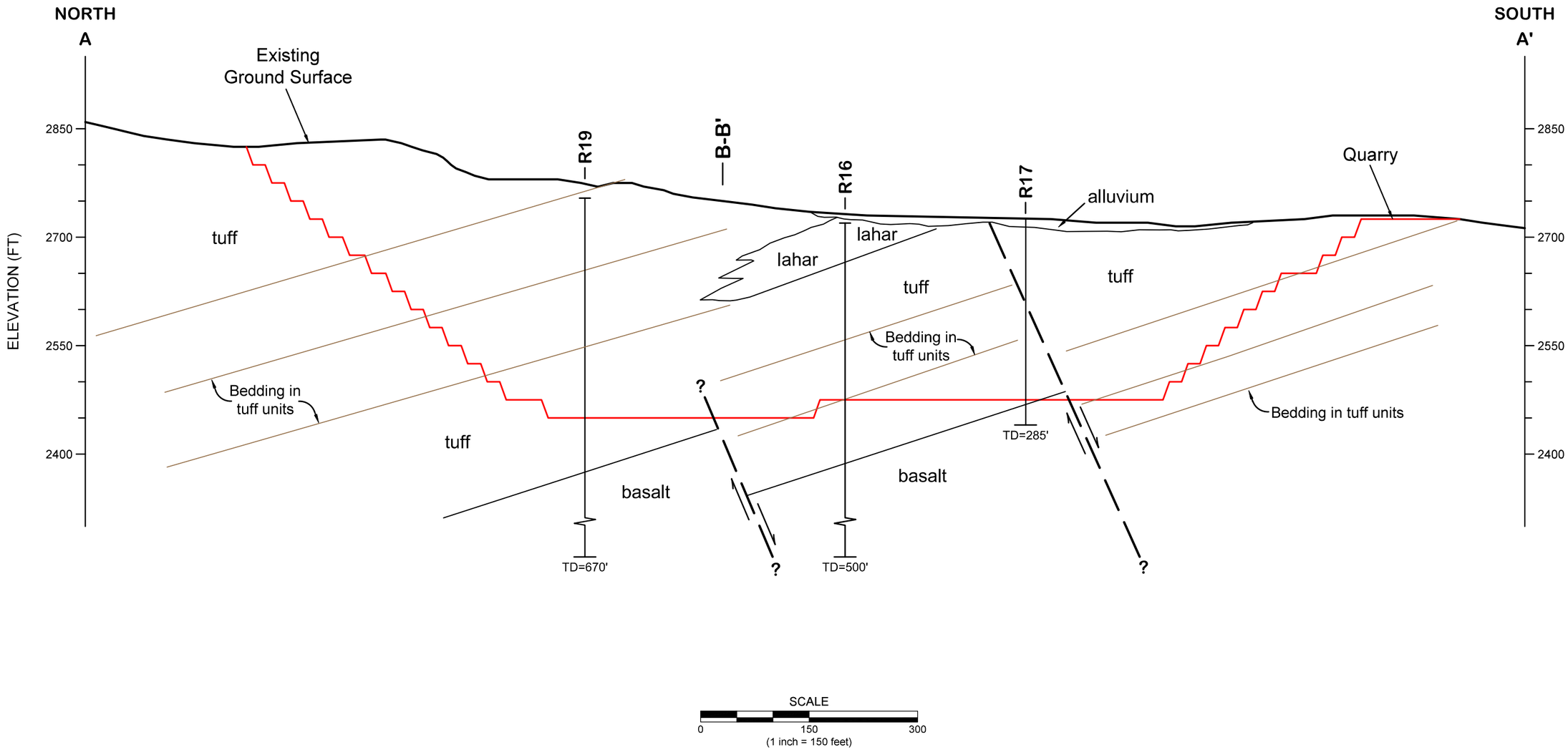
MAP PROVIDED BY MICROSOFT BING MAPS

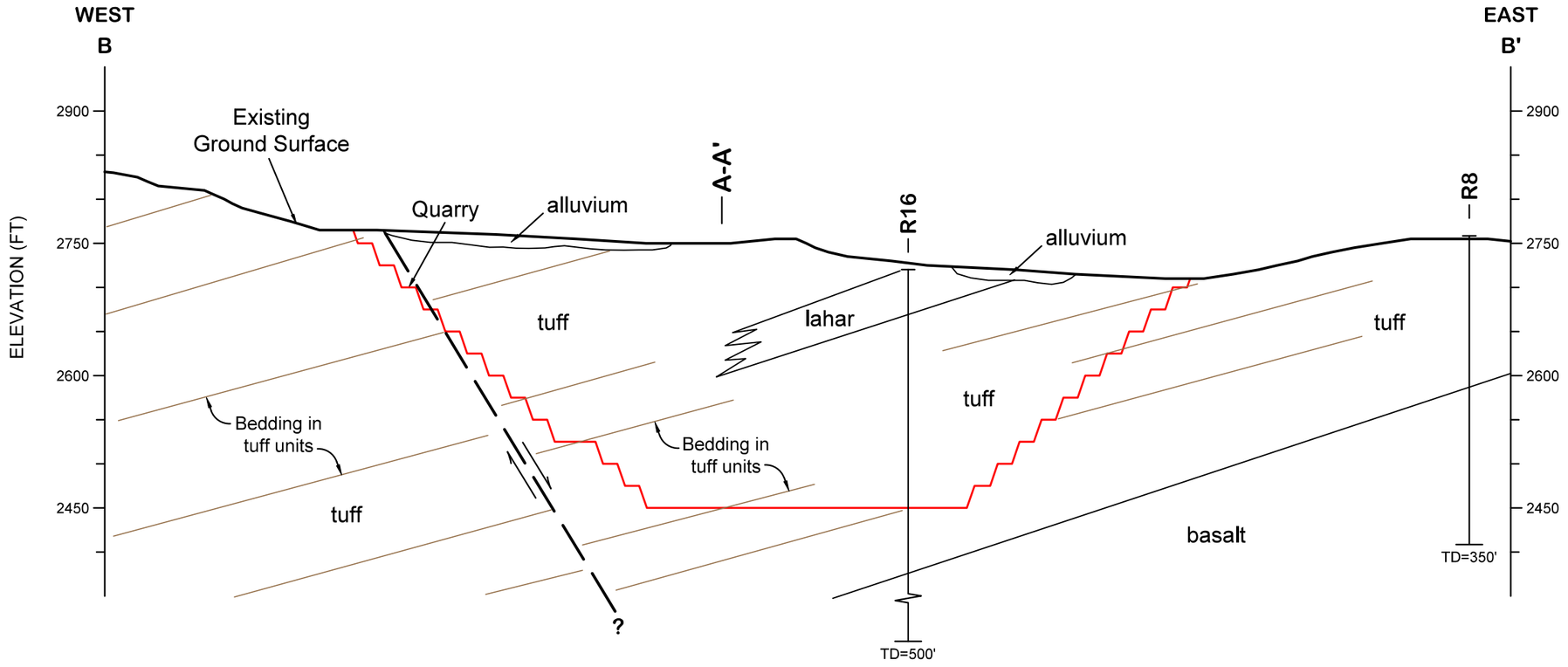
Terracon GeoReport



## GEOLOGIC CROSS-SECTION A-A'

Proposed Gem Hill Pozzolan Quarry - North Pit ■ Rosamond Hills, Kern County, California
January 30, 2020 ■ Terracon Project No. CB195156



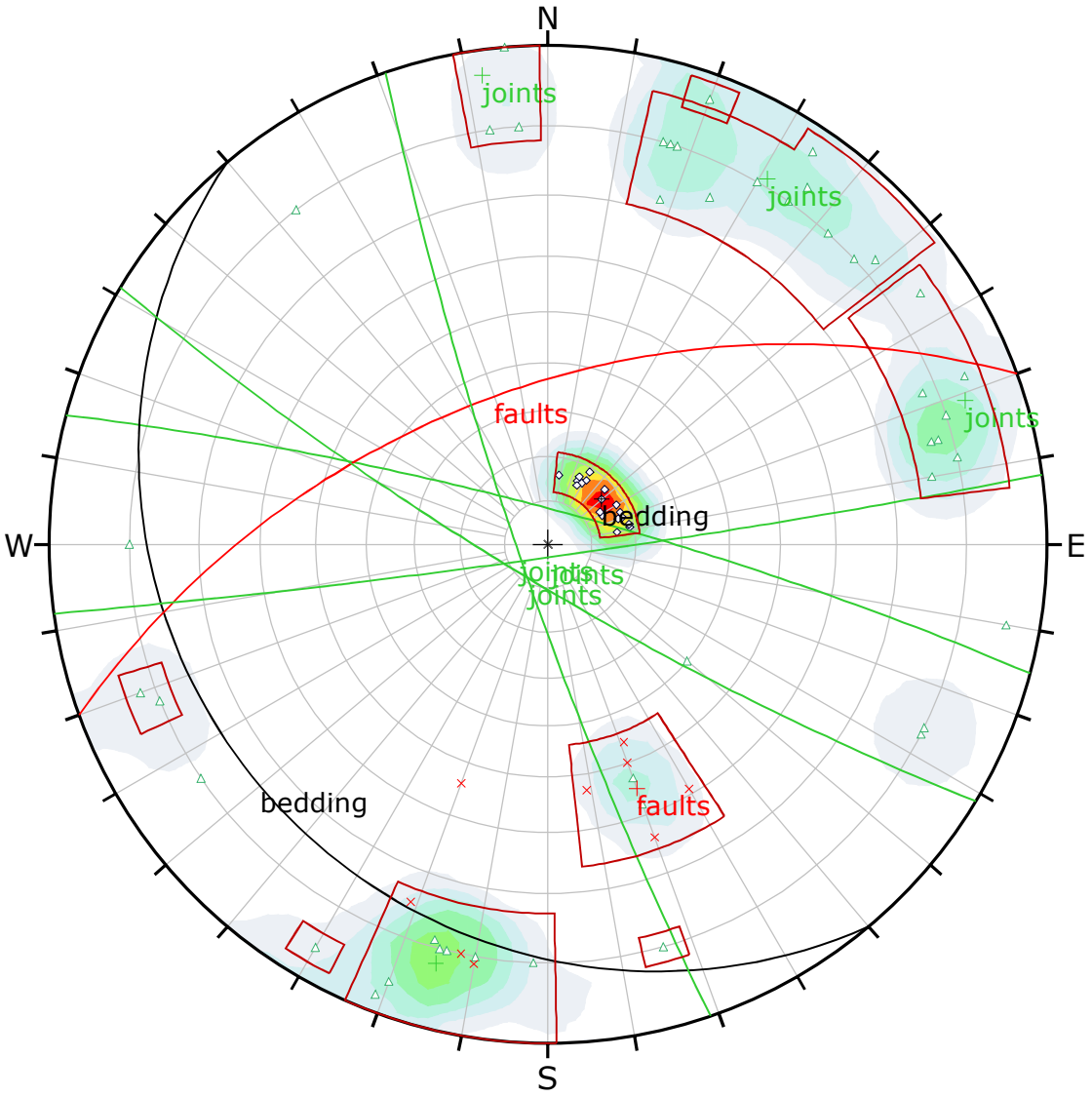



SCALE
0 150 300
(1 inch = 150 feet)

| Discontinuity Data – CP Gem Hill | | | | | | |
|---|---|---|---|---|---|---|
| **Discontinuity No.** | **Dip** | **Dip Direction** | **Type** | **Location** | **Geologic Unit** | **Continuity** |
| 1 | 18 | 250 | B | 1 | Tt4 | 5 |
| 2 | 86 | 020 | J | 1 | Tt4 | 1 |
| 3 | 53 | 351 | F | 1 | Tt4 | 5 |
| 4 | 80 | 215 | j | 1 | Tt4 | 3 |
| 5 | 17 | 250 | b | 2 | Tgc | 5 |
| 6 | 46 | 339 | f | 2 | Tgc | 4 |
| 7 | 80 | 010 | j | 3 | Tt4 | 3 |
| 8 | 50 | 340 | f | 3 | Tt4 | 5 |
| 9 | 82 | 229 | j | 3 | Tt4 | 3 |
| 10 | 83 | 216 | j | 3 | Tt4 | 3 |
| 11 | 16 | 205 | b | 5 | Tt4 | 5 |
| 12 | 78 | 248 | j | 5 | Tt4 | 4 |
| 13 | 81 | 010 | f | 5 | Tt4 | 5 |
| 14 | 16 | 189 | b | 6 | Tt4 | 5 |
| 15 | 19 | 210 | b | 7 | Tt4 | 5 |
| 16 | 16 | 209 | b | 8 | Tt4 | 5 |
| 17 | 58 | 340 | j | 9 | Tt4 | 2 |
| 18 | 75 | 205 | j | 9 | Tt4 | 2 |
| 19 | 15 | 206 | b | 10 | Tt4 | 5 |
| 20 | 17 | 211 | b | 11 | Tt4 | 5 |
| 21 | 84 | 236 | j | 11 | Tt4 | 3 |
| 22 | 84 | 248 | j | 11 | Tt4 | 3 |
| 23 | 40 | 310 | j | 11 | Tt4 | 5 |
| 24 | 80 | 344 | j | 12 | Tt4 | 5 |
| 25 | 90 | 175 | j | 12 | Tt4 | 4 |
| 26 | 18 | 226 | b | 1 | Tt4 | 5 |
| 27 | 87 | 200 | j | 1 | Tt4 | 2 |
| 28 | 87 | 214 | j | 15 | Tt4 | 2 |
| 29 | 88 | 021 | j | 16 | Tt4 | 2 |
| 30 | 79 | 016 | j | 16 | Tt4 | 3 |
| 31 | 53 | 340 | j | 17 | Tt4 | 3 |
| 32 | 59 | 330 | f | 17 | Tt4 | 4 |
| 33 | 64 | 340 | f | 18 | Tt4 | 5 |
| 34 | 19 | 258 | b | 18 | Tt4 | 5 |
| 35 | 75 | 021 | f | 19 | Tt4 | 4 |
| 36 | 76 | 260 | j | 19 | Tt4 | 4 |
| 37 | 77 | 255 | j | 20 | Tt4 | 4 |
| 38 | 86 | 030 | j | 21 | Tt4 | 3 |
| 39 | 82 | 070 | j | 21 | Tt4 | 4 |
| 40 | 86 | 280 | j | 21 | Tt4 | 4 |
| 41 | 80 | 015 | j | 1 | | 3 |
| 42 | 78 | 255 | j | 2 | | 2 |
| 43 | 17 | 205 | b | 2 | | 5 |
| 44 | 16 | 230 | b | 16 | | 5 |
| 45 | 72 | 198 | j | 17 | | 3 |
| 46 | 18 | 246 | b | 17 | | 5 |
| 47 | 80 | 012 | f | 18 | | 4 |
| 48 | 54 | 020 | f | 18 | | 4 |
| 49 | 16 | 260 | b | 16 | | 5 |
| 50 | 19 | 256 | b | 19 | | 5 |
| 51 | 14 | 242 | b | 20 | | 5 |

| Discontinuity No. | Dip | Dip Direction | Type | Location | Geologic Unit | Continuity |
|---|---|---|---|---|---|---|
| 52 | 18 | 240 | b | 21 | | 5 |
| 53 | 14 | 238 | b | 6 | | 5 |
| 54 | 80 | 143 | j | 30 | | 5 |
| 55 | 80 | 090 | j | 30 | | 5 |
| 56 | 80 | 258 | j | 30 | | 4 |
| 57 | 80 | 056 | j | 30 | | 5 |
| 58 | 80 | 297 | j | 30 | | 5 |
| 59 | 80 | 252 | j | 30 | | 5 |
| 60 | 80 | 197 | j | 30 | | 5 |
| 61 | 80 | 014 | j | 30 | | 5 |
| 62 | 80 | 068 | j | 30 | | 5 |
| 63 | 80 | 222 | j | 30 | | 5 |
| 64 | 80 | 296 | j | 30 | | 5 |
| 65 | 80 | 198 | j | 30 | | 5 |
| 66 | 80 | 196 | j | 30 | | 4 |
| 67 | 80 | 210 | j | 30 | | 4 |
| 68 | 80 | 176 | j | 30 | | 5 |
| 69 | 80 | 002 | j | 30 | | 5 |
| 70 | 80 | 227 | j | 30 | | 4 |
| 71 | 80 | 172 | j | 30 | | 2 |

* C1 - discontinuous (less than 3 ft.); C2 - slightly continuous (3 to 10 feet); C3 - moderately continuous (10 to 30 feet); C4 - highly continuous (30 to 100 feet); C5 - very continuous (greater than 100 feet).
Based on Department of the Interior - Bureau of Reclamation, Engineering Geology Field Manual (2nd edition 1998)




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

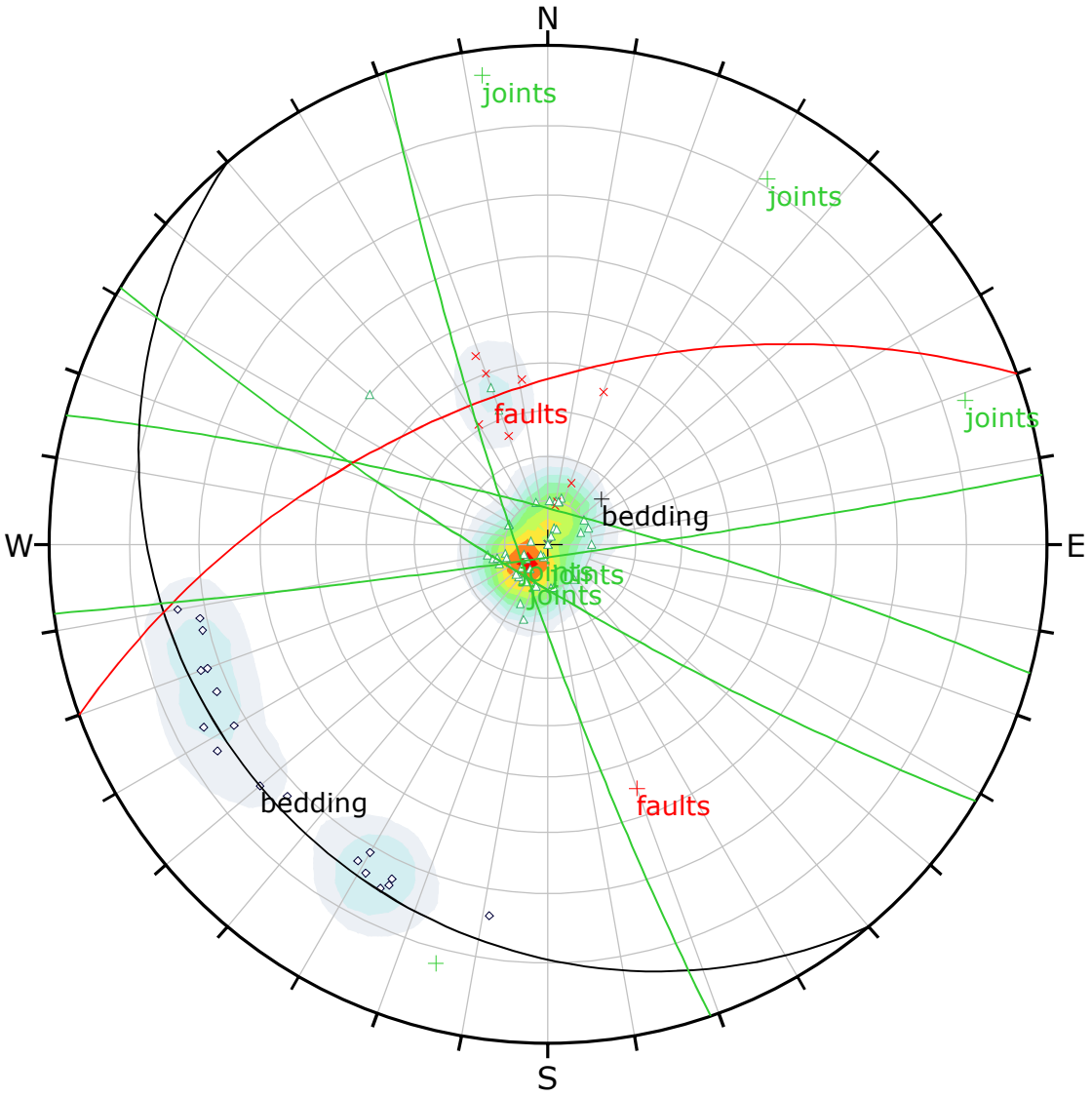
| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

This diagram shows the average plane for each structure set identified by pole clusters analysis. Note that contours are based on pole vectors.

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

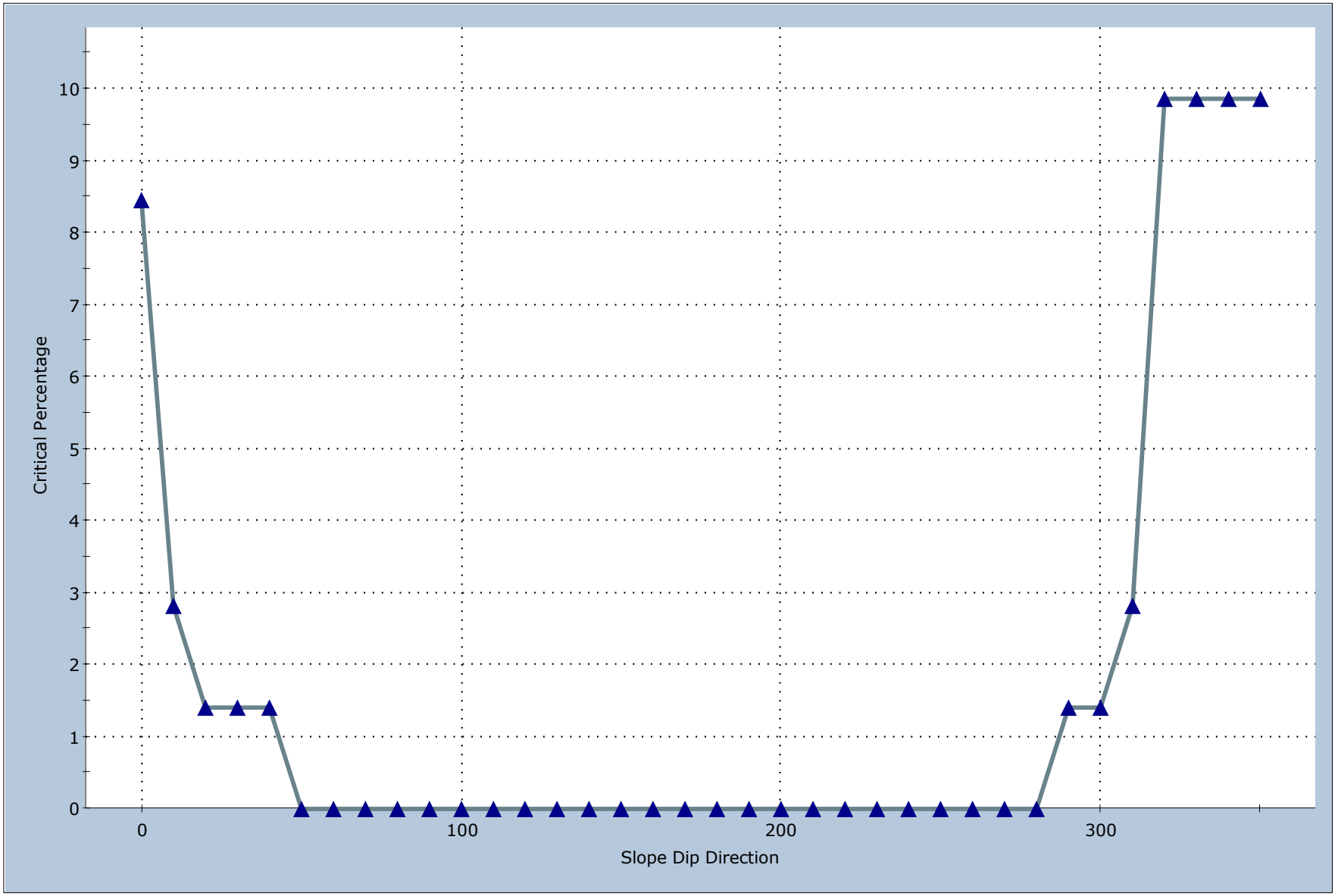
| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

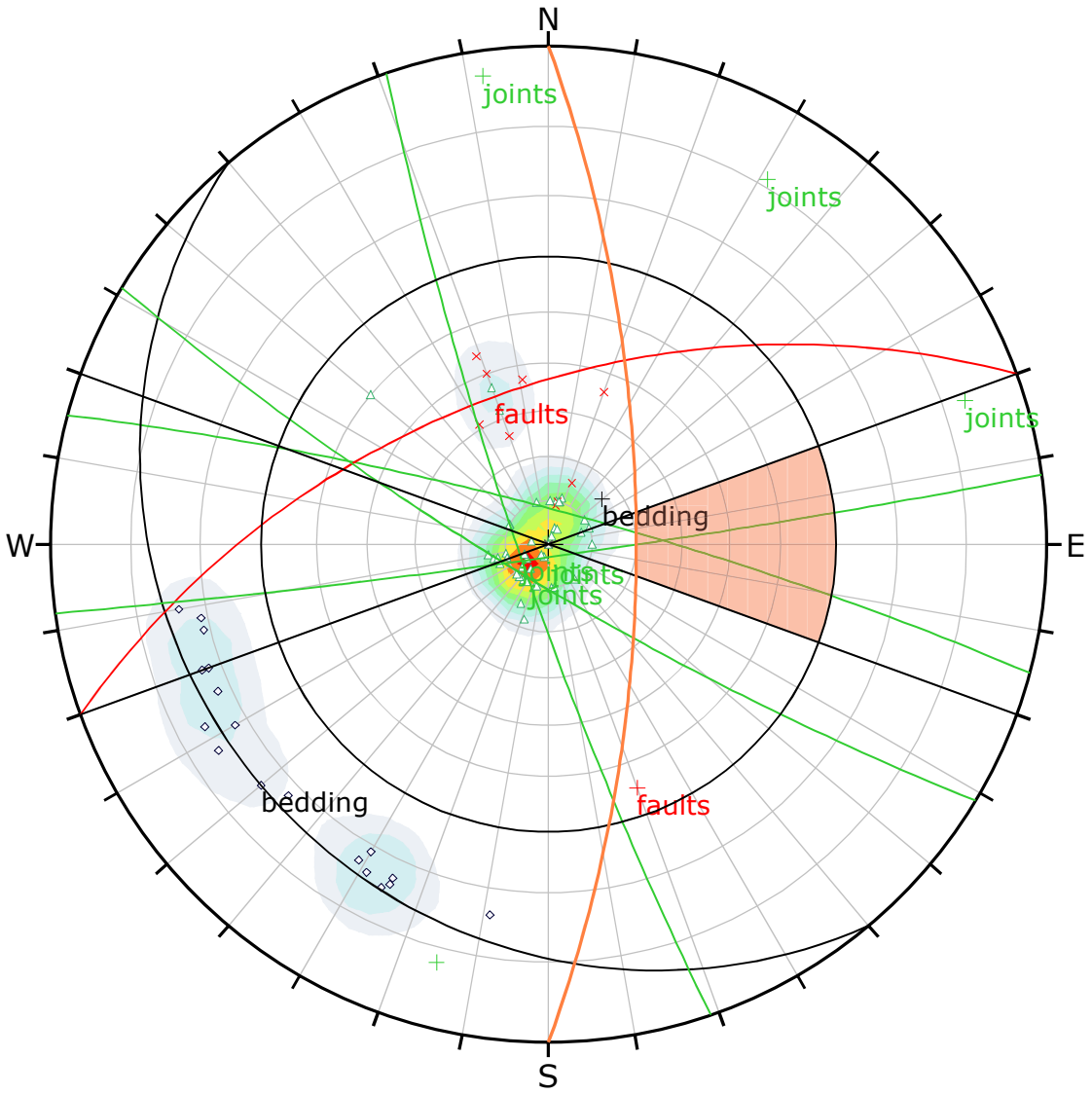
| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | dip vectors_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |

# Planar Sliding: Critical Percentage vs. Slope Dip Direction




**Mean Values**

**Slope Dip = 70** **Slope Dip Direction = 0** **Friction Angle = 30** **Lateral Limit = 20**




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 90 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

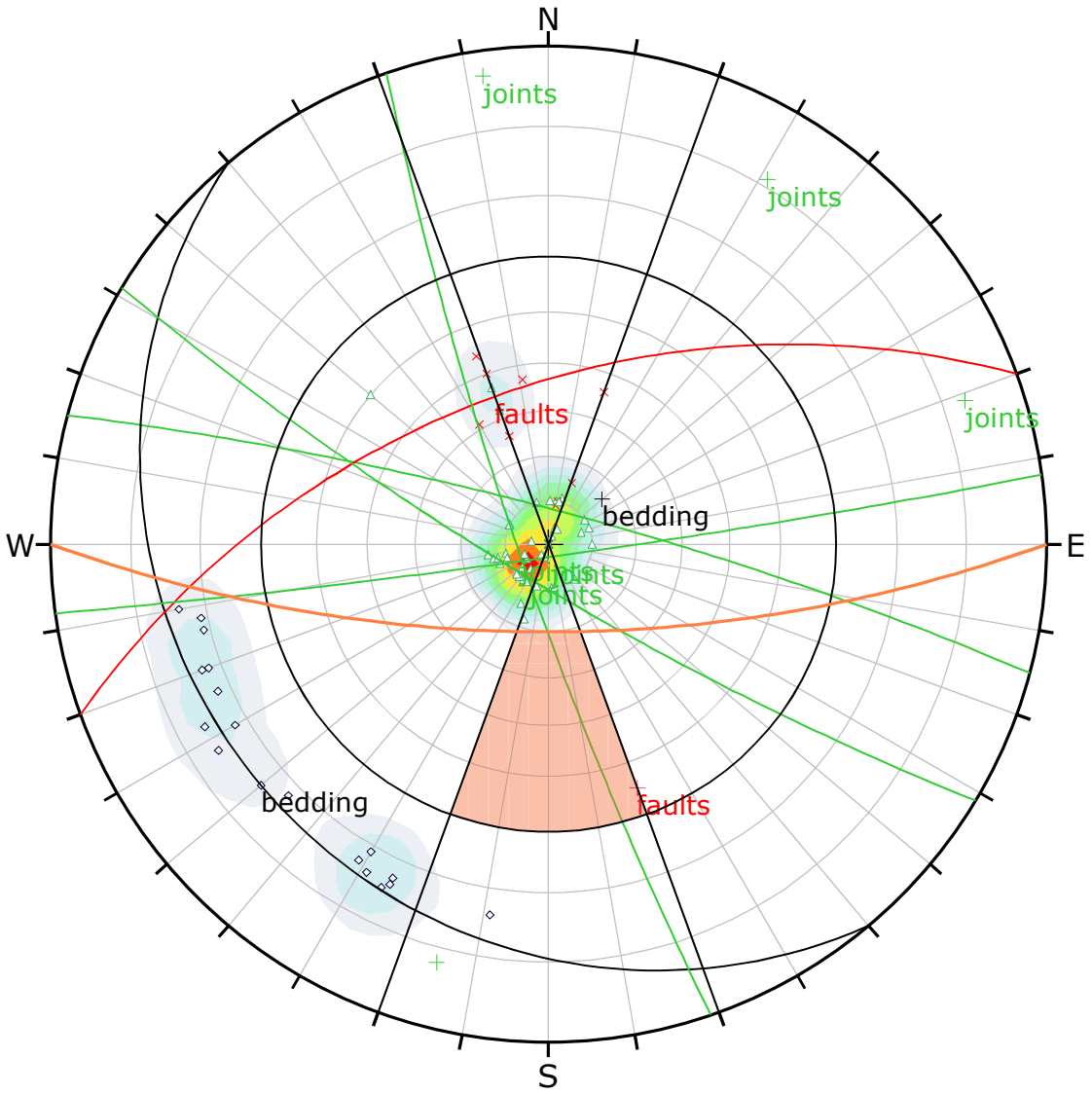
| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 0 | 71 | 0.00% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | cardinal plots Planar_Field and Google lineaments Data.dips7 | *Date* | 12/16/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 180 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

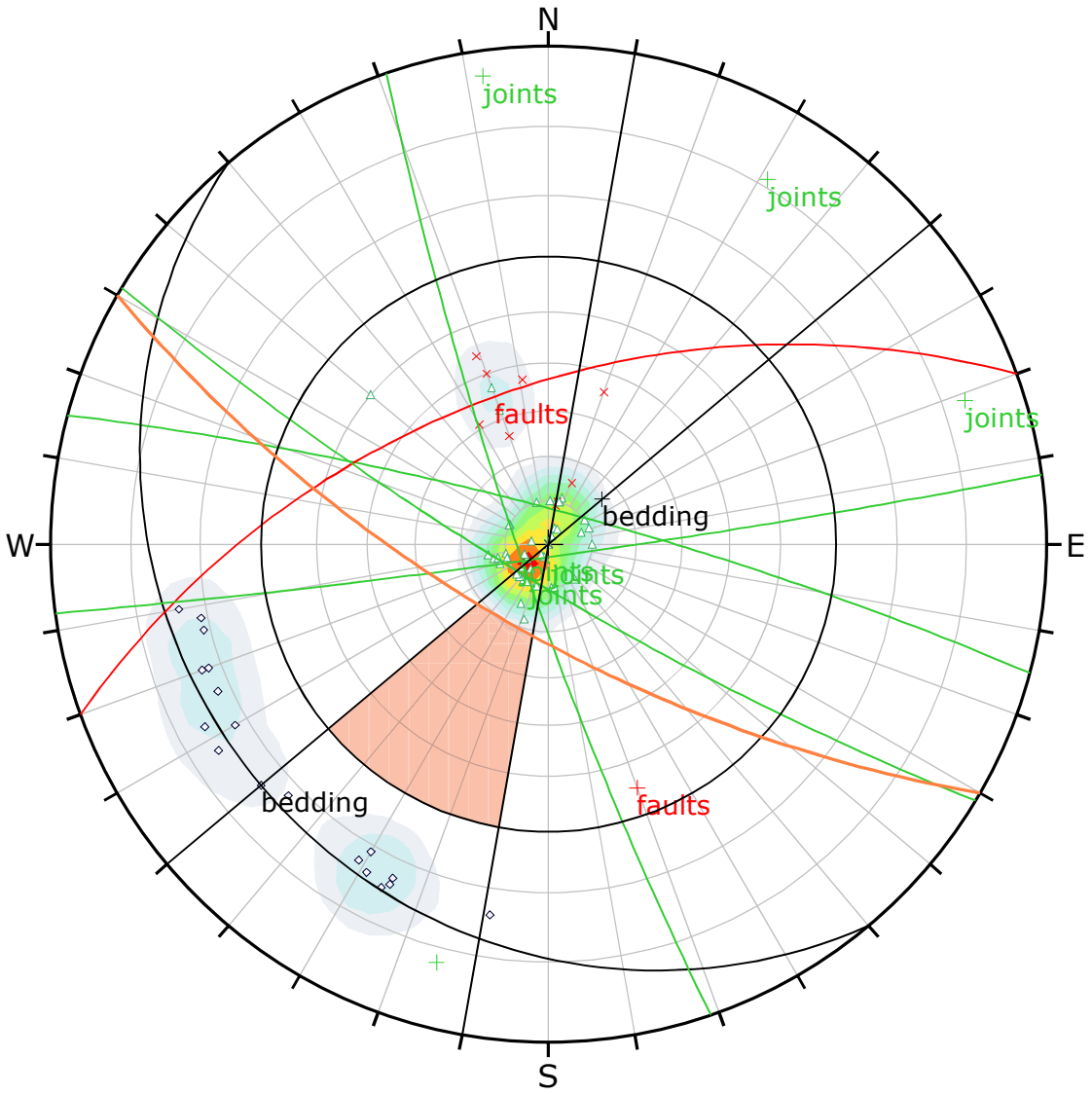
| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 0 | 71 | 0.00% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | cardinal plots Planar_Field and Google lineaments Data.dips7 | *Date* | 12/16/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 210 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

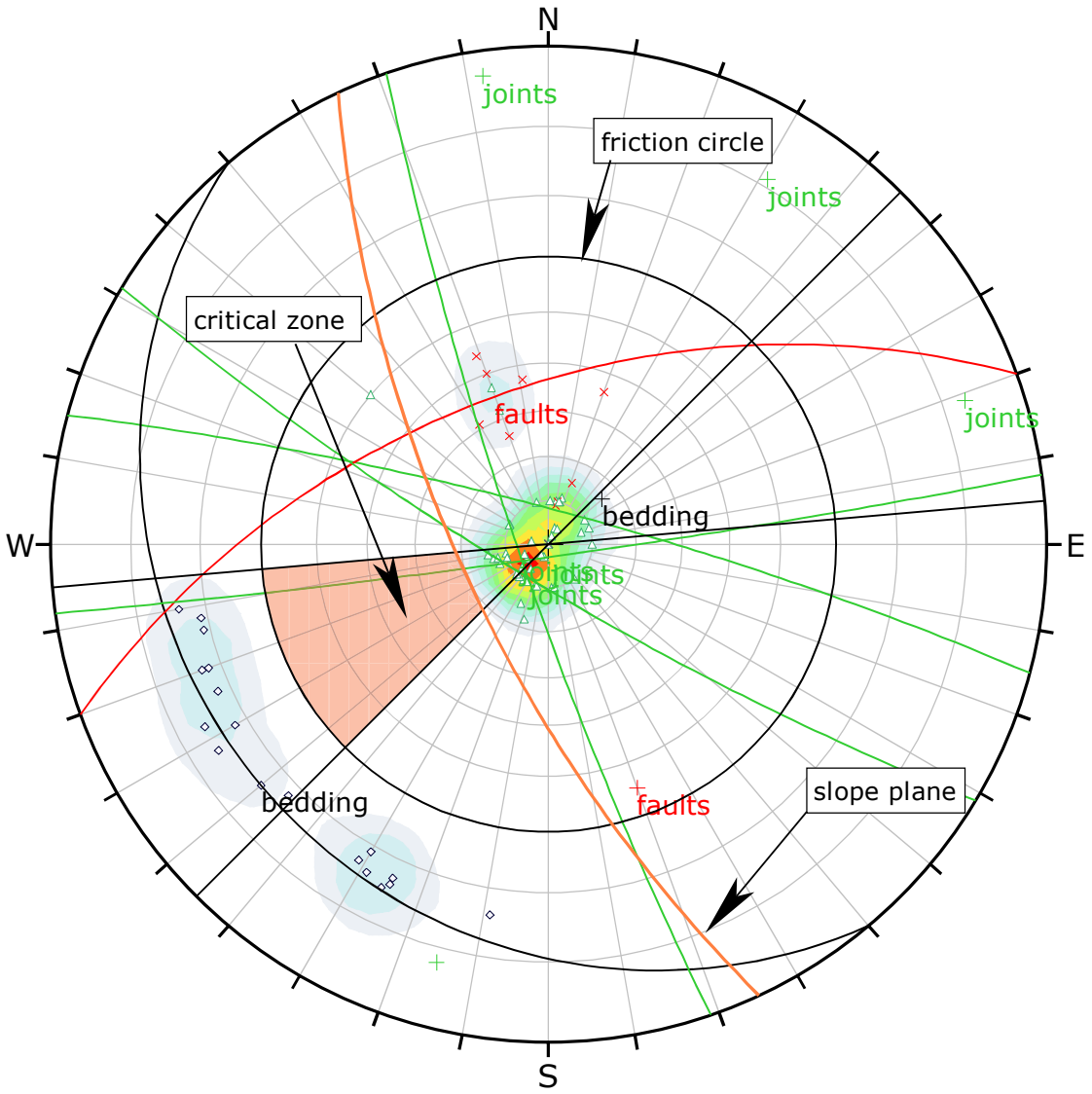
| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 0 | 71 | 0.00% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | Planar_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 245 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

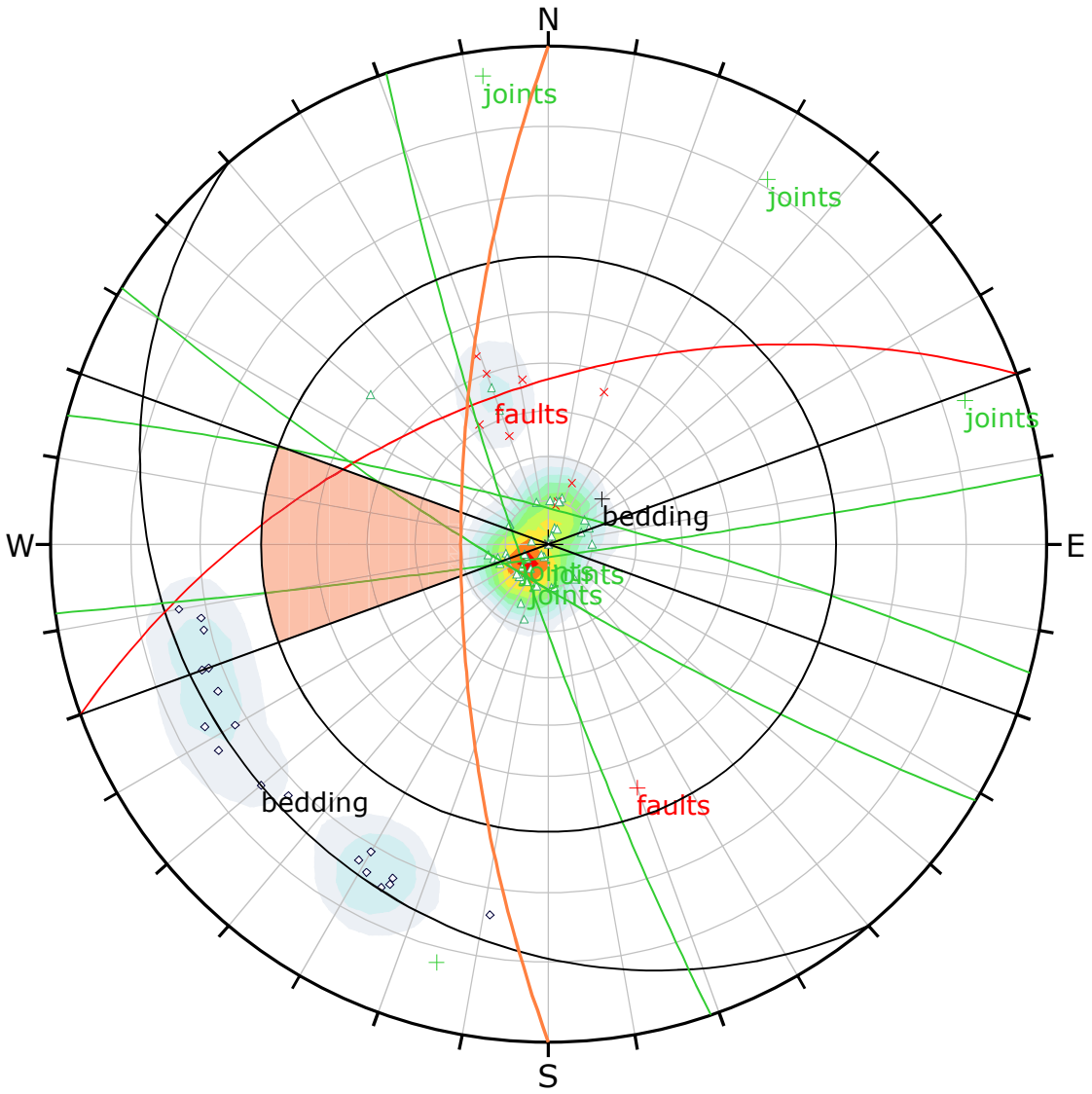
| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 0 | 71 | 0.00% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | Planar_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 270 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

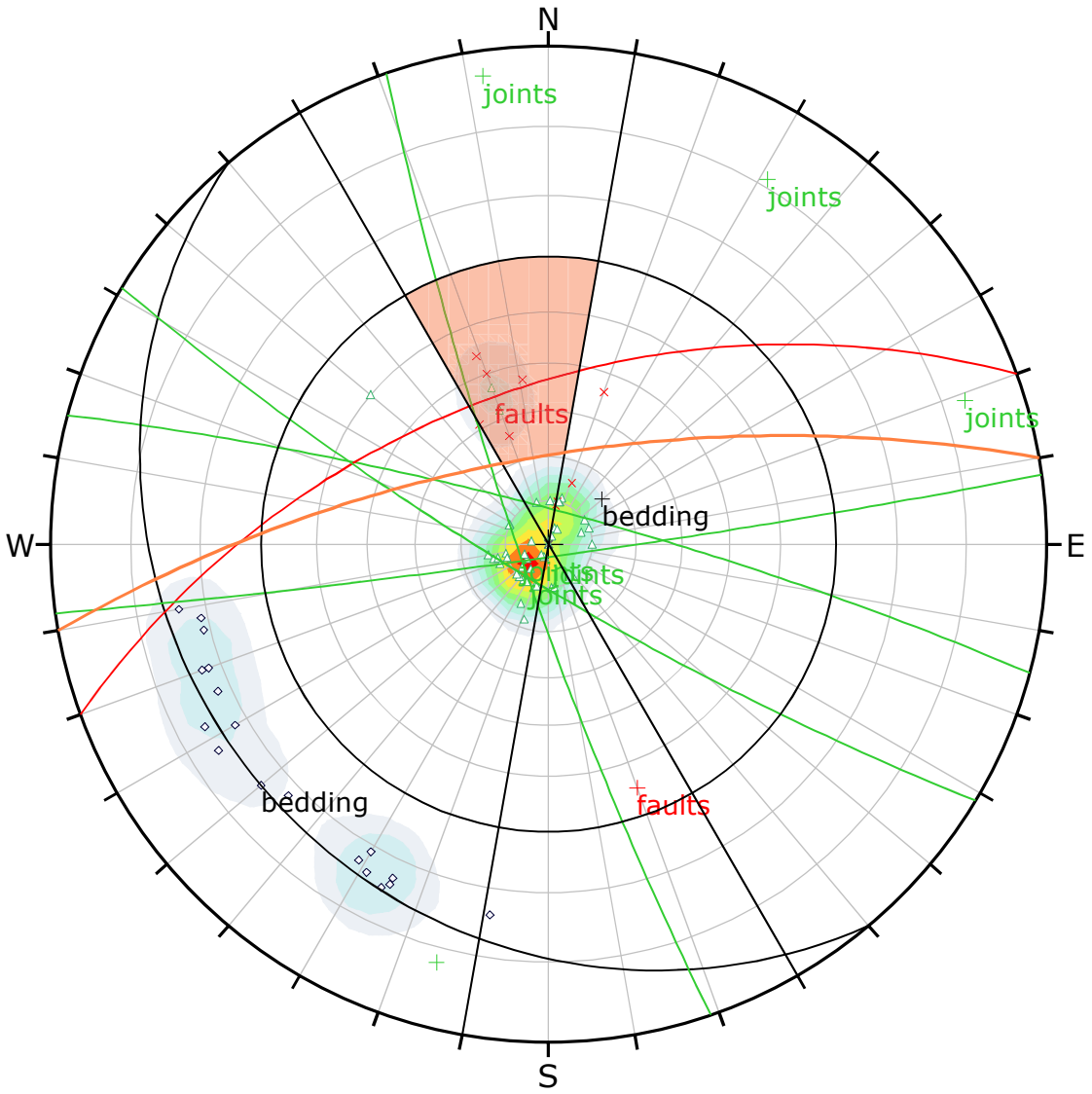
| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 0 | 71 | 0.00% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | cardinal plots Planar_Field and Google lineaments Data.dips7 | *Date* | 12/16/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Planar Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 350 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

| | Critical | Total | % |
|---|---|---|---|
| Planar Sliding (All) | 7 | 71 | 9.86% |
| Planar Sliding (Set 3: faults) | 7 | 7 | 100.00% |

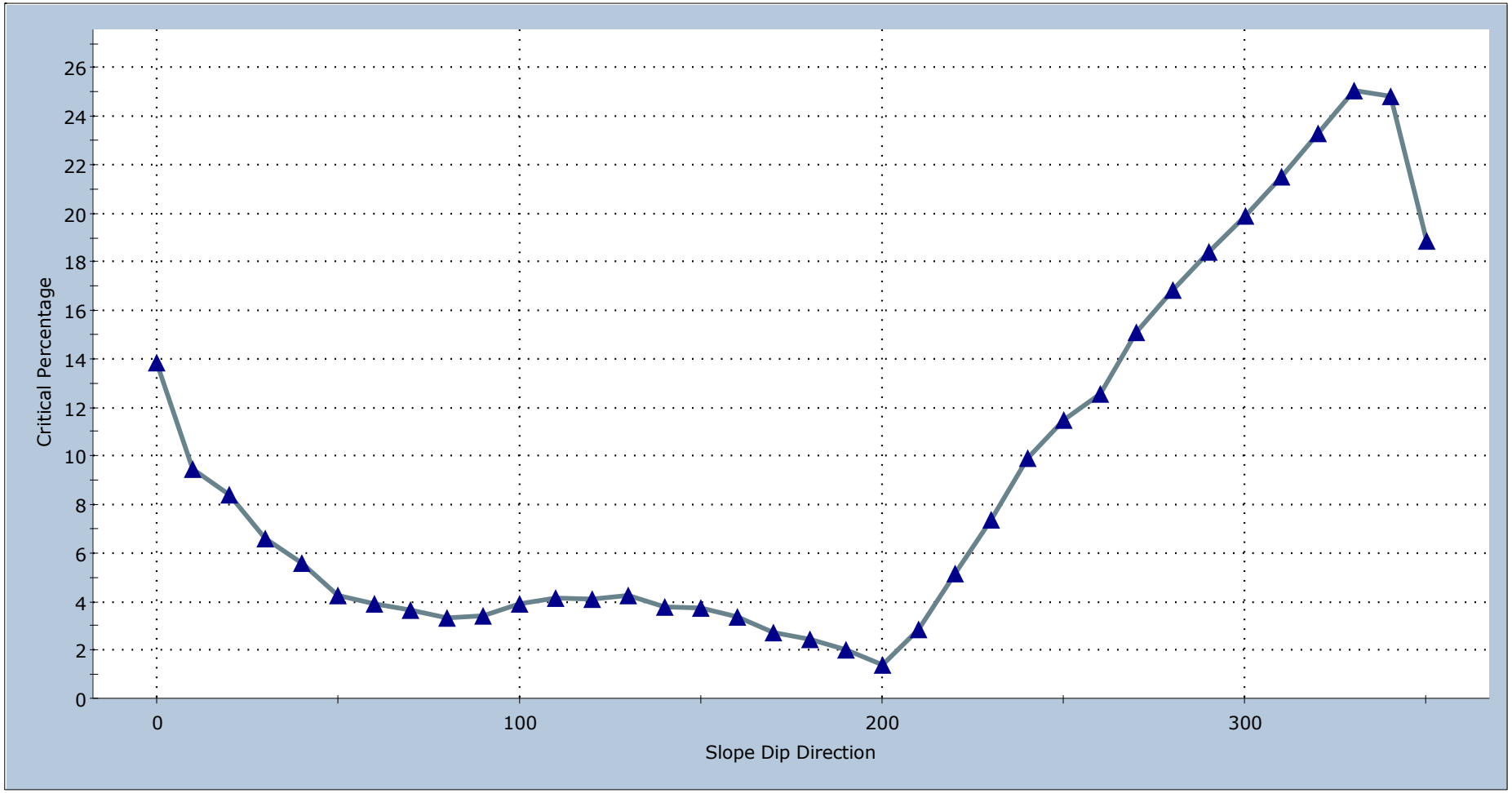
| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | Planar_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |

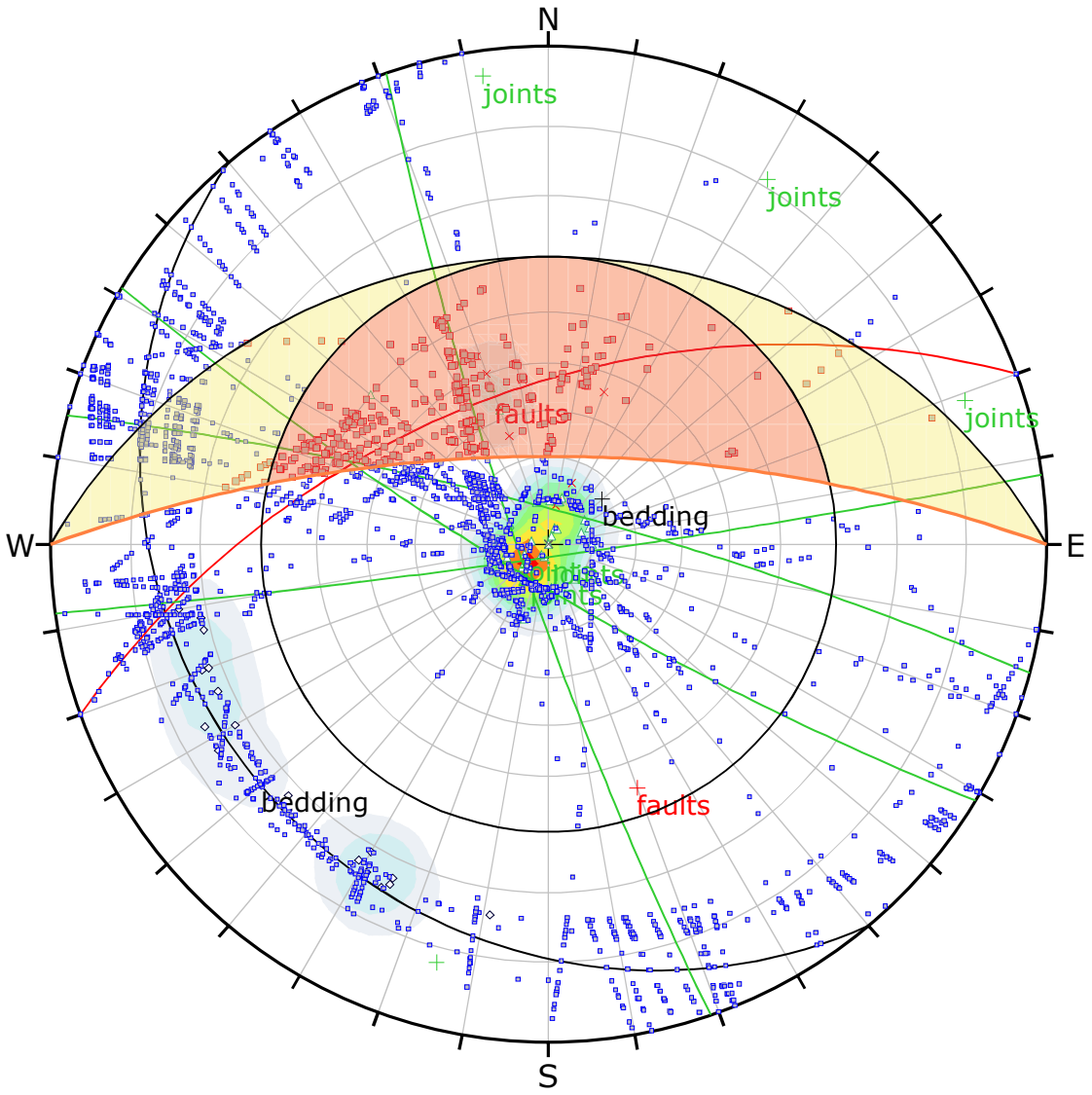
# Wedge Sliding: Critical Percentage vs. Slope Dip Direction




**Mean Values**

**Slope Dip = 70** **Slope Dip Direction = 0** **Friction Angle = 30** **Lateral Limit = 20**

| | | | |
|---|---|---|---|
| Terracon | *Project* | Gem Hill Pozzolan | |
| | *Analysis Description* | Kinematic | |
| | *Drawn By* Terracon | | *Author* JMc |
| DIPS 7.014 | *File Name* wedge_Field and Google lineaments Data.dips7 | | *Date* 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| | Critical Intersection | |
| | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Wedge Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 0 |
| **Friction Angle** | 30° |

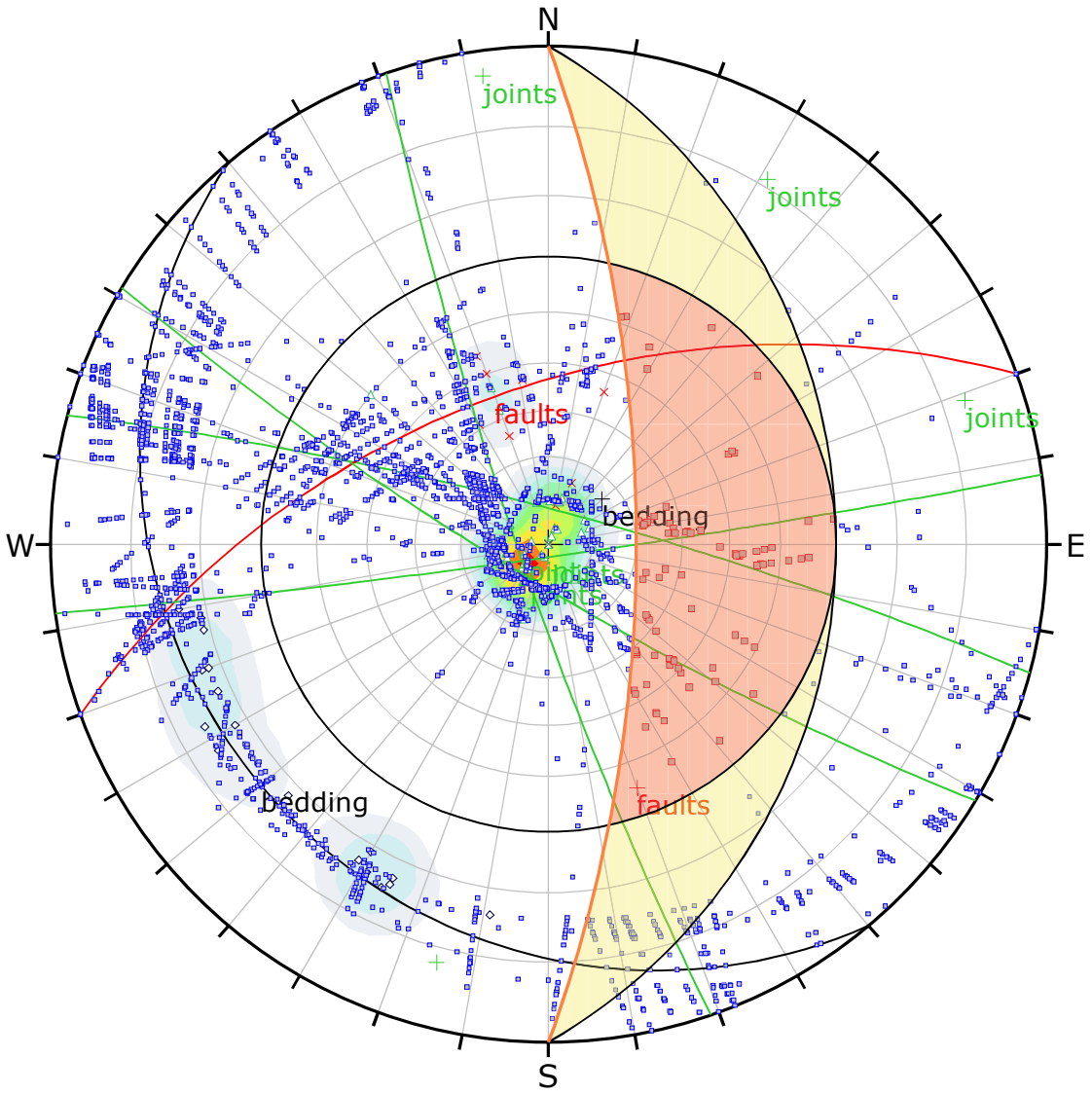
| | Critical | Total | % |
|---|---|---|---|
| Wedge Sliding | 345 | 2485 | 13.88% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Grid Data Planes |
| **Intersections Count** | 2485 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | wedge_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Symbol | Feature |
|---|---|
| | Critical Intersection |
| | Intersection |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Wedge Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 90 |
| **Friction Angle** | 30° |

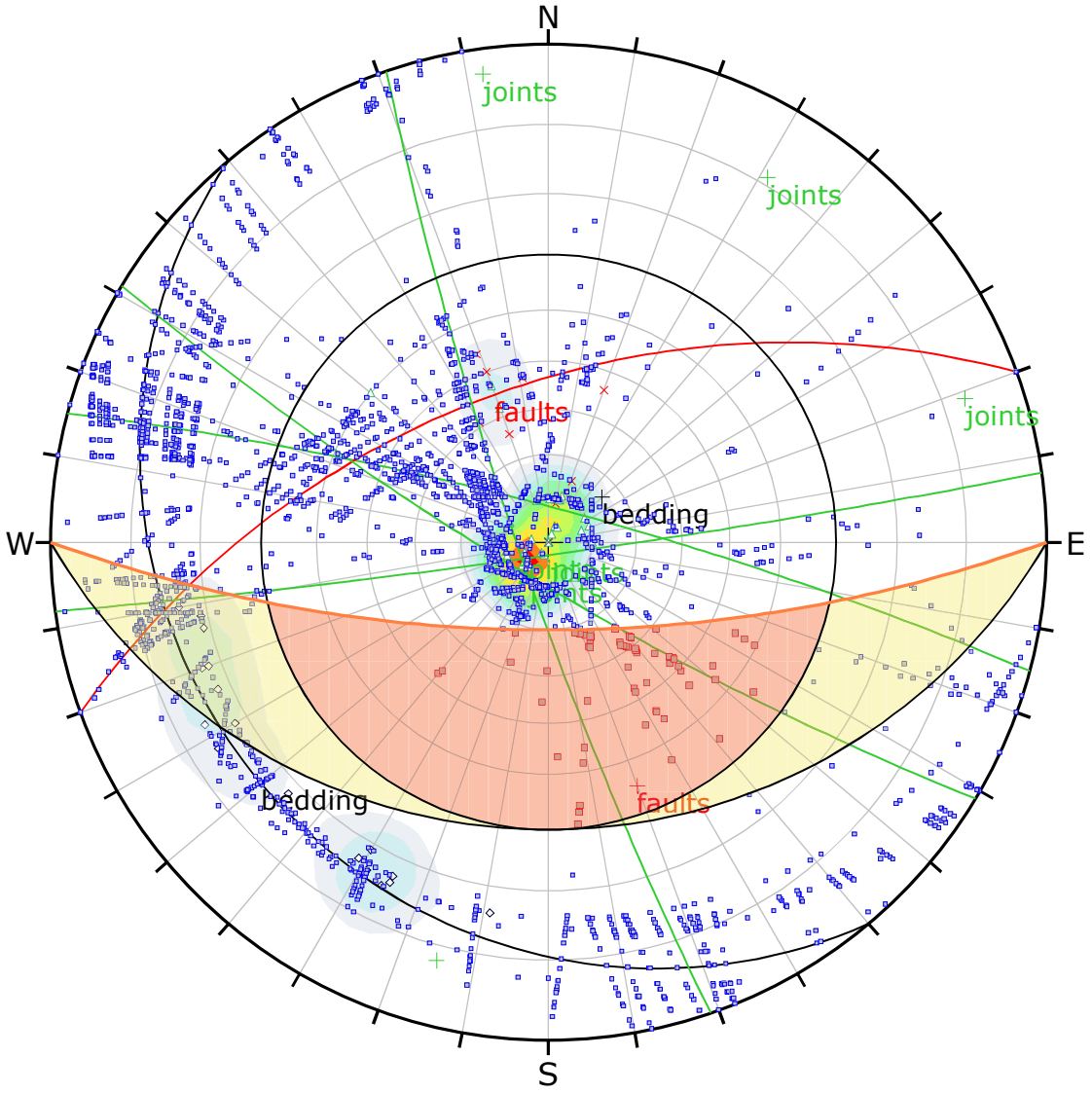
| | Critical | Total | % |
|---|---|---|---|
| Wedge Sliding | 86 | 2485 | 3.46% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Grid Data Planes |
| **Intersections Count** | 2485 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | wedge_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| | Critical Intersection | |
| | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Wedge Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 180 |
| **Friction Angle** | 30° |

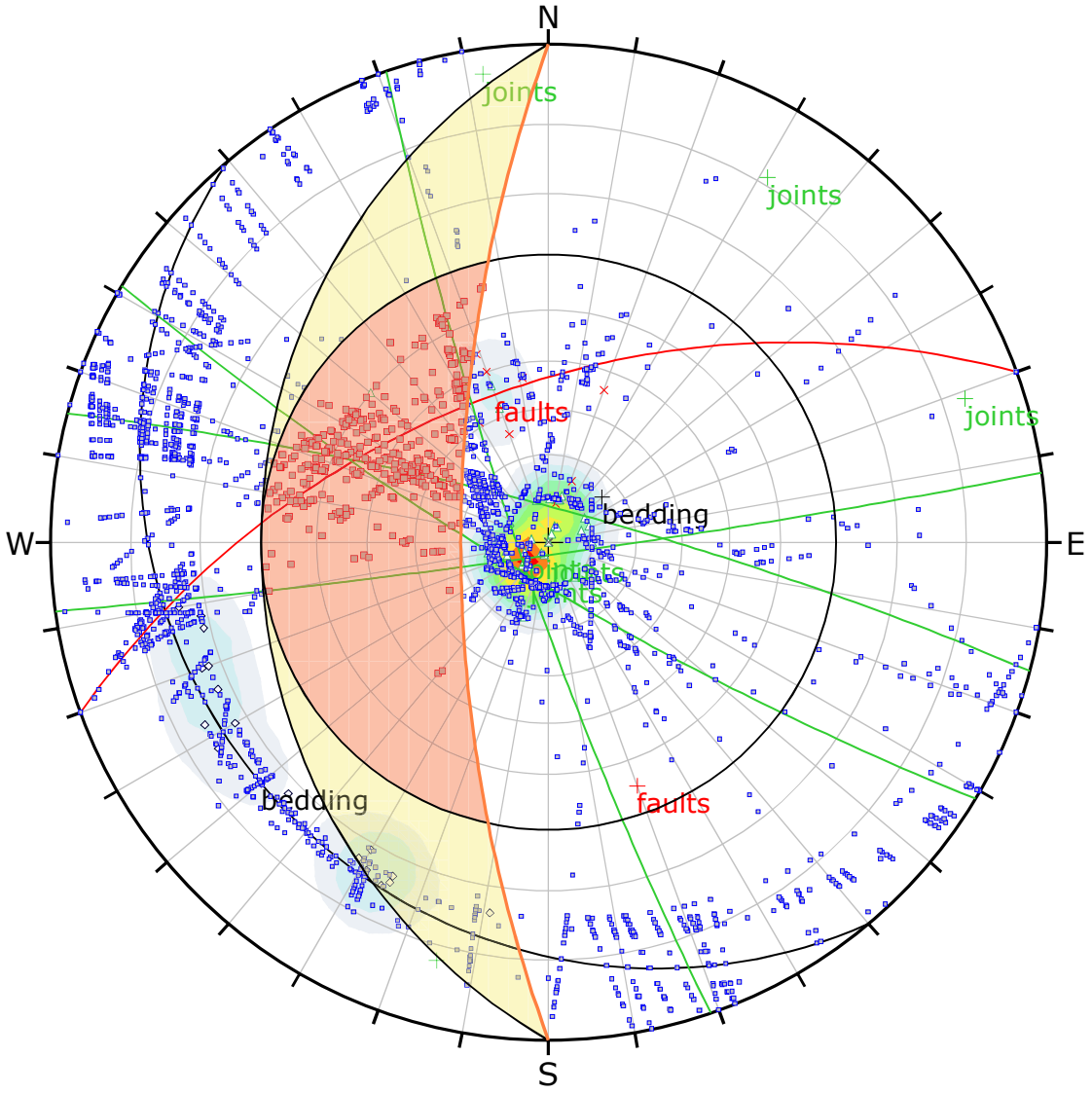
| | Critical | Total | % |
|---|---|---|---|
| Wedge Sliding | 62 | 2485 | 2.49% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Grid Data Planes |
| **Intersections Count** | 2485 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | wedge_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Symbol | Feature |
|---|---|
| | Critical Intersection |
| | Intersection |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Wedge Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 270 |
| **Friction Angle** | 30° |

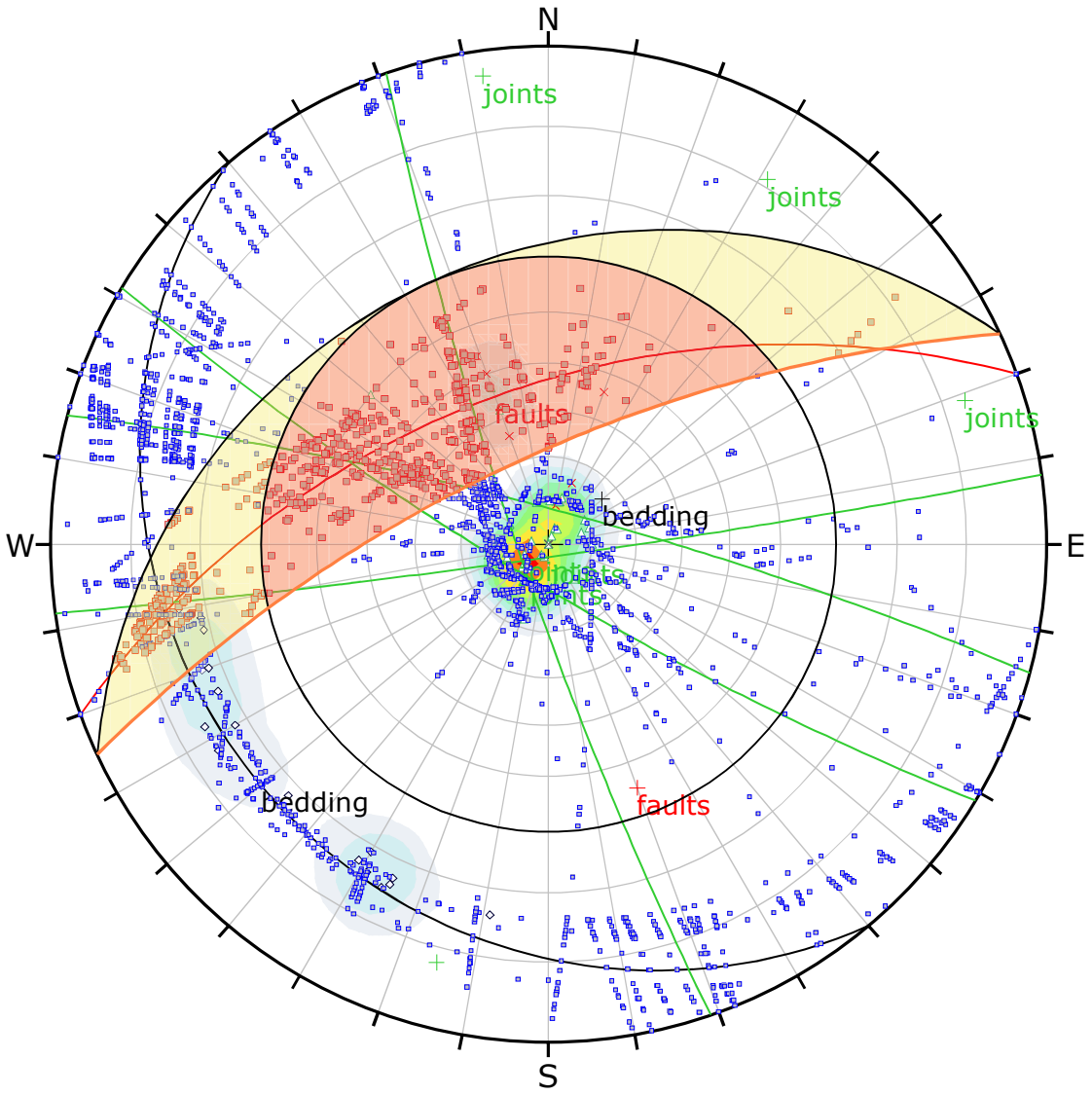
| | Critical | Total | % |
|---|---|---|---|
| Wedge Sliding | 376 | 2485 | 15.13% |

| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Grid Data Planes |
| **Intersections Count** | 2485 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

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| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | wedge_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |

| Symbol | Feature |
|---|---|
| | Critical Intersection |
| | Intersection |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 2.90 |
| | 2.90 - 5.80 |
| | 5.80 - 8.70 |
| | 8.70 - 11.60 |
| | 11.60 - 14.50 |
| | 14.50 - 17.40 |
| | 17.40 - 20.30 |
| | 20.30 - 23.20 |
| | 23.20 - 26.10 |
| | 26.10 - 29.00 |

| | |
|---|---|
| **Contour Data** | Dip Vectors |
| **Maximum Density** | 28.09% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Wedge Sliding |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 335 |
| **Friction Angle** | 30° |

| | Critical | Total | % |
|---|---|---|---|
| Wedge Sliding | 625 | 2485 | 25.15% |

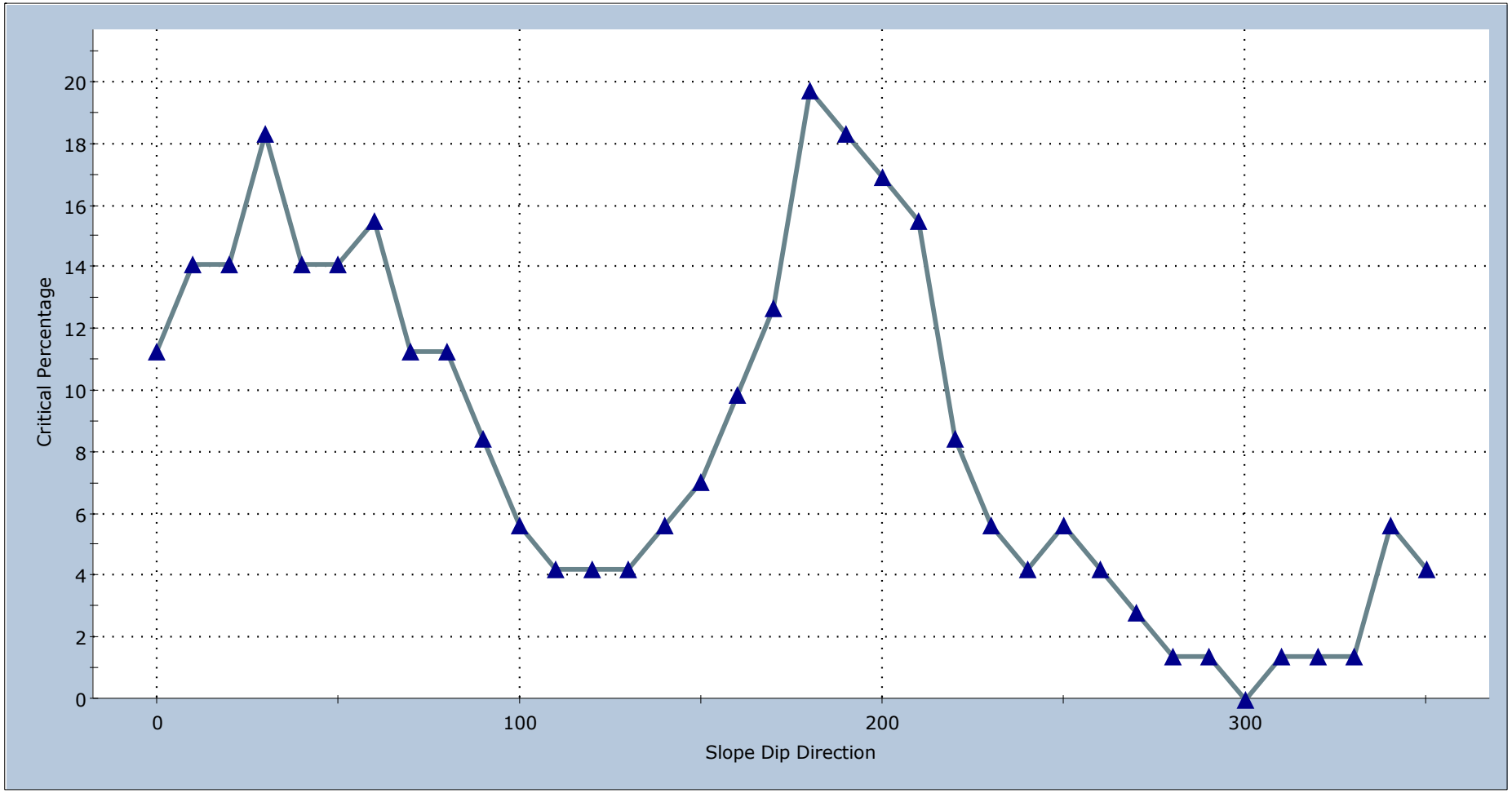
| | |
|---|---|
| **Plot Mode** | Dip Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Grid Data Planes |
| **Intersections Count** | 2485 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | wedge_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |

# Flexural Toppling: Critical Percentage vs. Slope Dip Direction

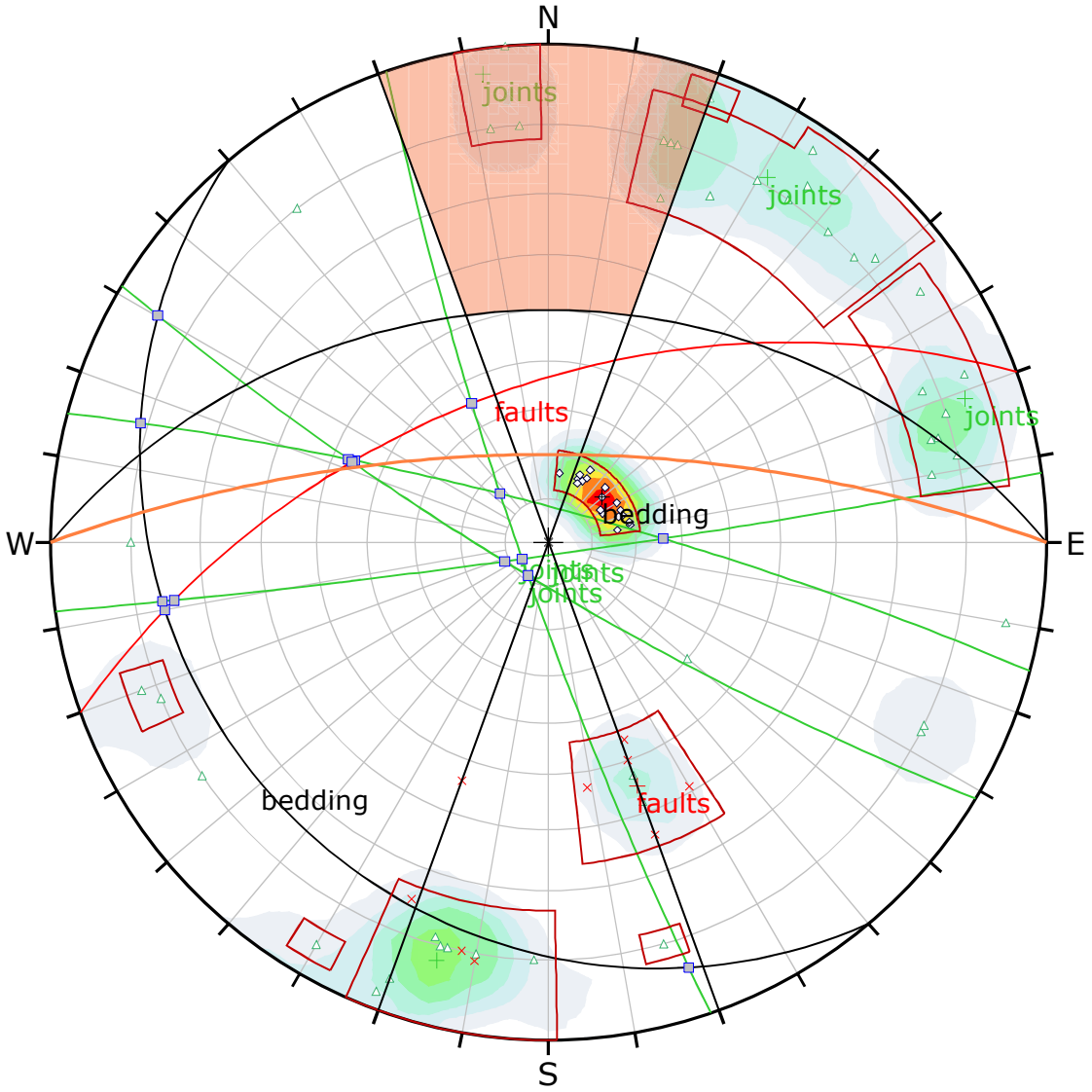



**Mean Values**

**Slope Dip = 70** **Slope Dip Direction = 0** **Friction Angle = 30** **Lateral Limit = 20**

| | | | |
|---|---|---|---|
| Terracon | Project | Gem Hill Pozzolan | |
| | Analysis Description | Kinematic | |
| | Drawn By | Terracon | Author JMc |
| | File Name | wedge_Field and Google lineaments Data.dips7 | Date 12/13/2019 |

DIPS 7.014




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| □ | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Flexural Toppling |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 0 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

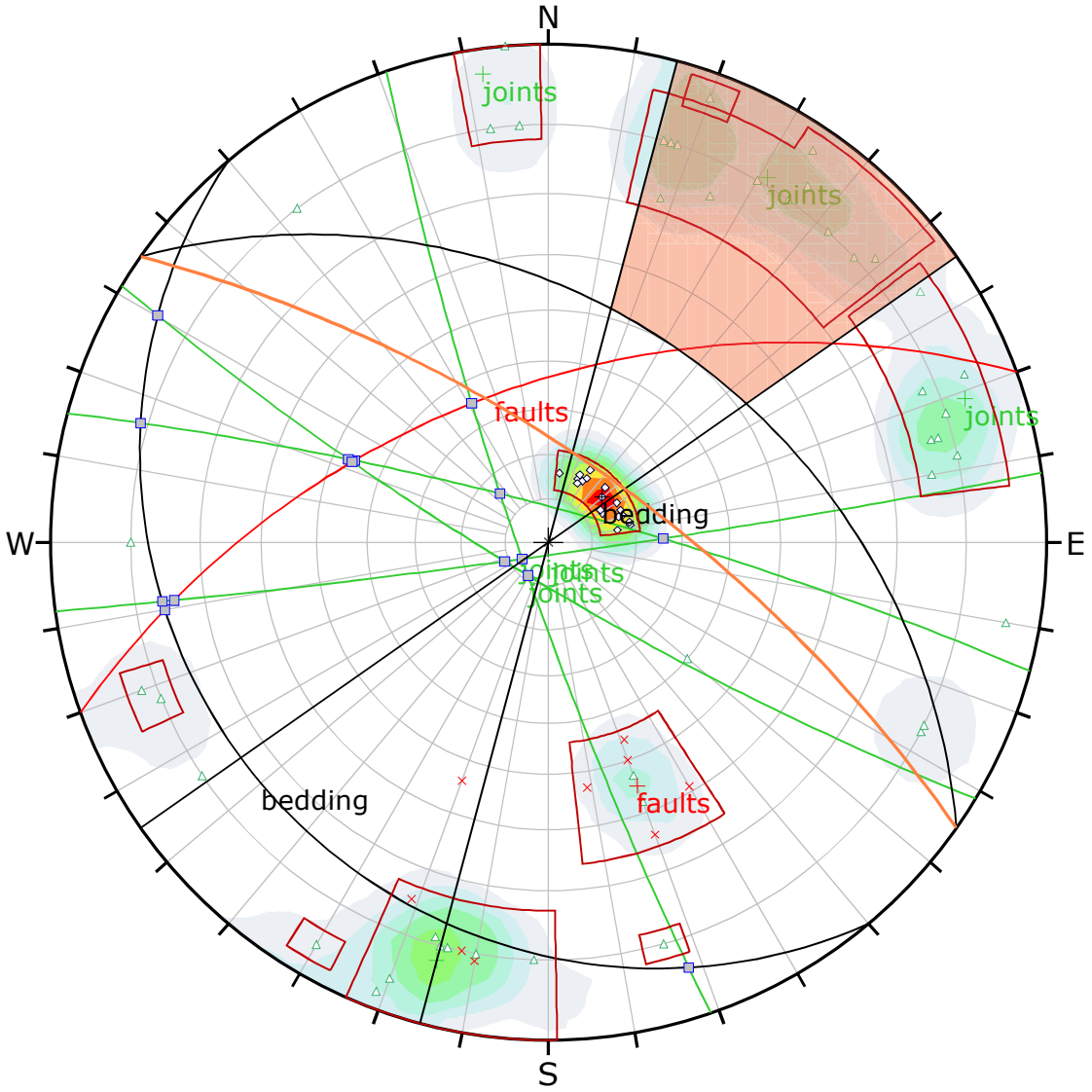
| | Critical | Total | % |
|---|---|---|---|
| Flexural Toppling (All) | 8 | 71 | 11.27% |
| Flexural Toppling (Set 1) | 1 | 11 | 9.09% |
| Flexural Toppling (Set 5: joints) | 4 | 13 | 30.77% |
| Flexural Toppling (Set 6: joints) | 3 | 4 | 75.00% |

| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Mean Set Planes |
| **Intersections Count** | 15 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | topple_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| □ | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Flexural Toppling |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 35 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

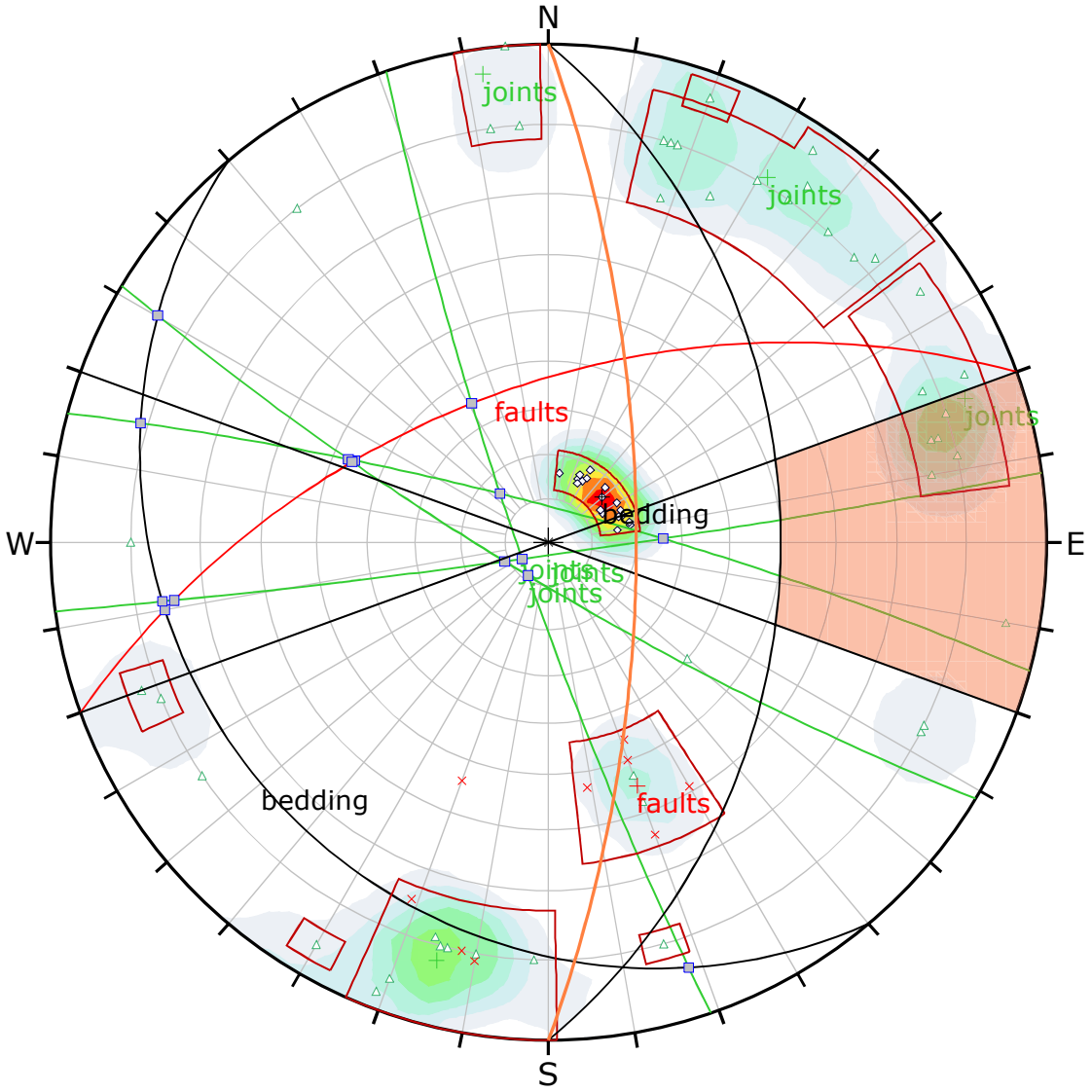
| | Critical | Total | % |
|---|---|---|---|
| Flexural Toppling (All) | 13 | 71 | 18.31% |
| Flexural Toppling (Set 1) | 1 | 11 | 9.09% |
| Flexural Toppling (Set 5: joints) | 12 | 13 | 92.31% |

| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Mean Set Planes |
| **Intersections Count** | 15 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | topple_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| □ | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Flexural Toppling |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 90 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

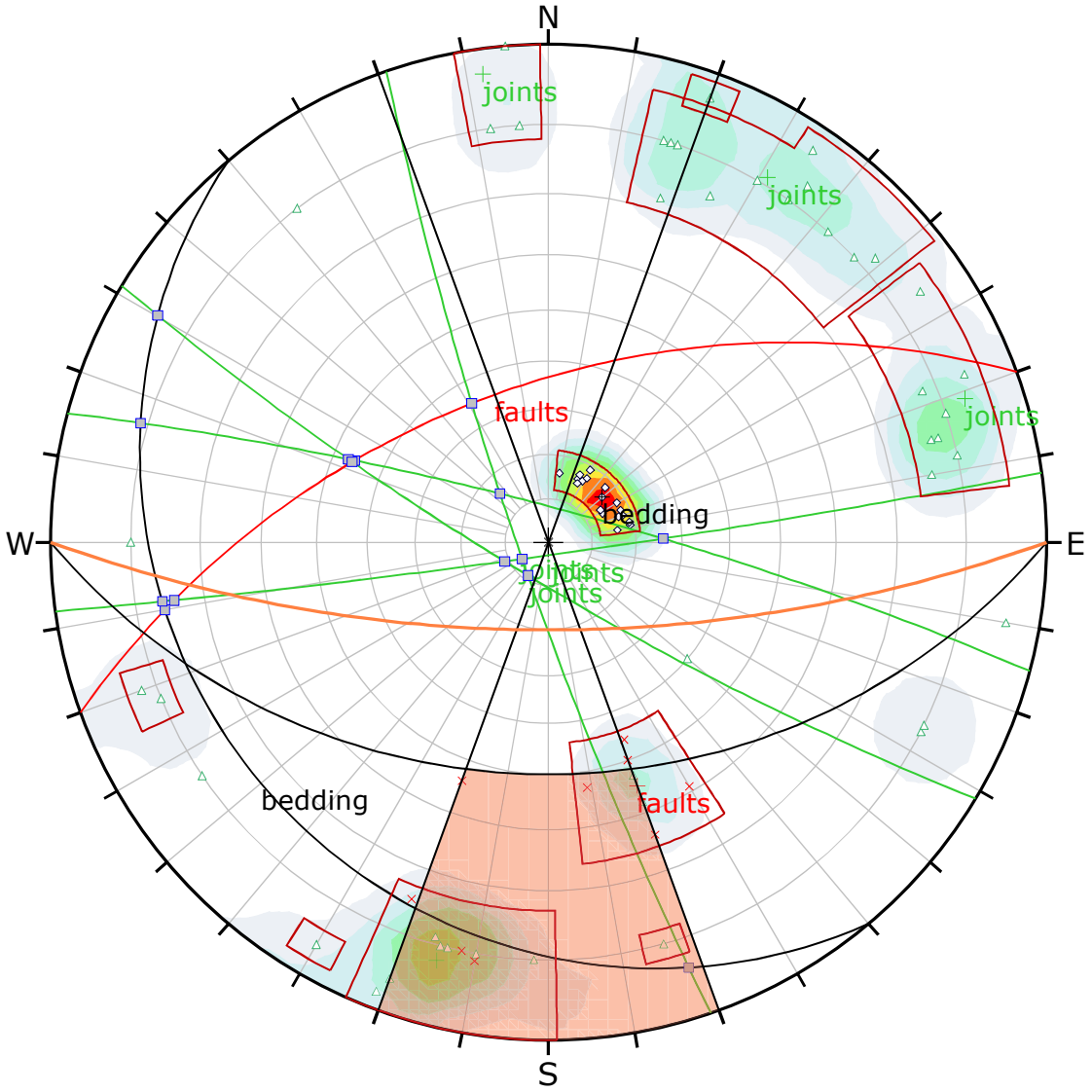
| | Critical | Total | % |
|---|---|---|---|
| Flexural Toppling (All) | 6 | 71 | 8.45% |
| Flexural Toppling (Set 4: joints) | 5 | 10 | 50.00% |

| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Mean Set Planes |
| **Intersections Count** | 15 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | topple_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| □ | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Flexural Toppling |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 180 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

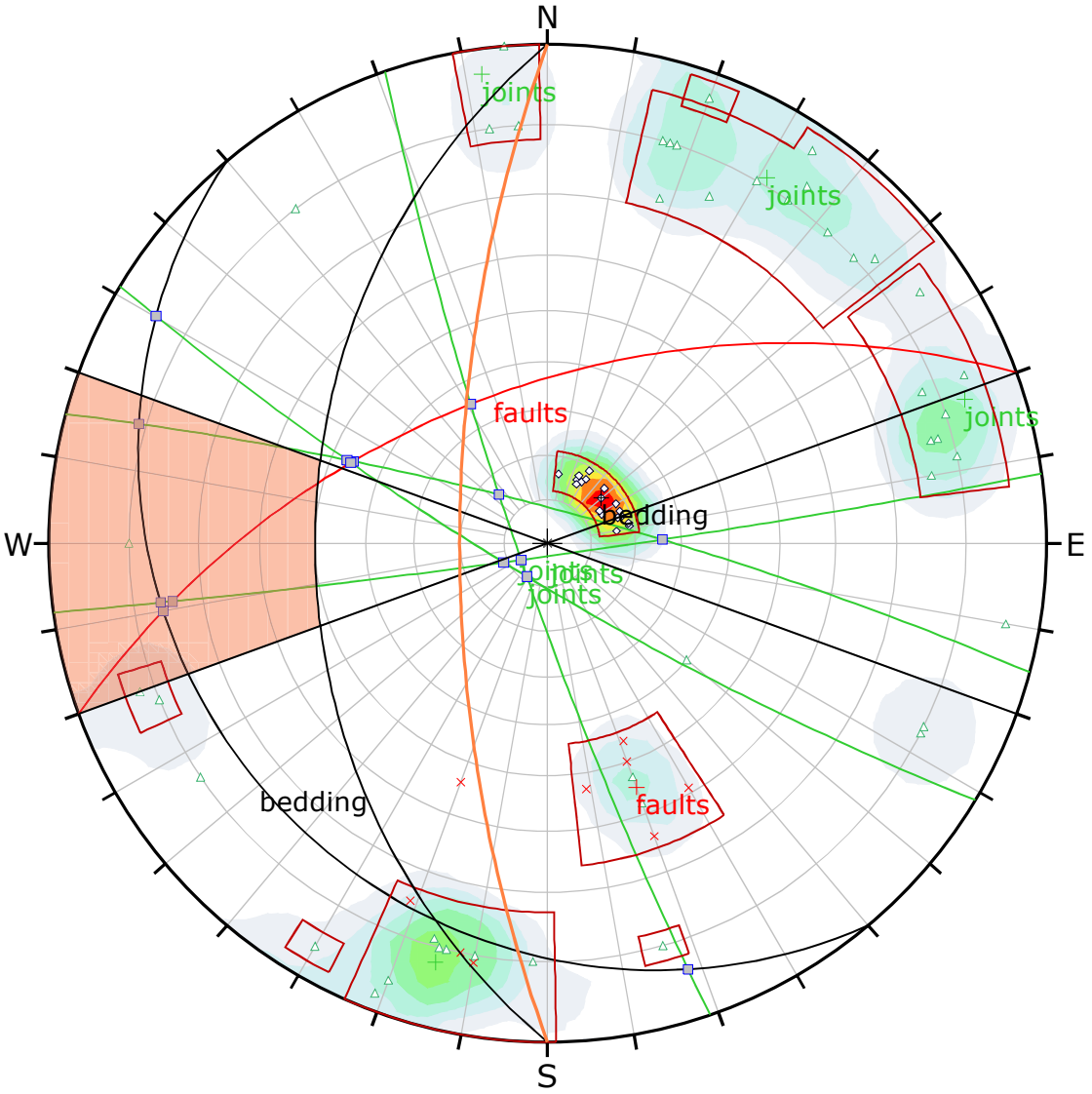
| | Critical | Total | % |
|---|---|---|---|
| Flexural Toppling (All) | 14 | 71 | 19.72% |
| Flexural Toppling (Set 1) | 8 | 11 | 72.73% |
| Flexural Toppling (Set 3: faults) | 4 | 7 | 57.14% |
| Flexural Toppling (Set 6: joints) | 1 | 4 | 25.00% |

| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Mean Set Planes |
| **Intersections Count** | 15 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | topple_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Symbol | TYPE | Quantity |
|---|---|---|
| ◇ | b | 18 |
| × | f | 9 |
| △ | j | 44 |
| **Symbol** | **Feature** | |
| □ | Intersection | |

| Color | Density Concentrations |
|---|---|
| | 0.00 - 1.80 |
| | 1.80 - 3.60 |
| | 3.60 - 5.40 |
| | 5.40 - 7.20 |
| | 7.20 - 9.00 |
| | 9.00 - 10.80 |
| | 10.80 - 12.60 |
| | 12.60 - 14.40 |
| | 14.40 - 16.20 |
| | 16.20 - 18.00 |

| | |
|---|---|
| **Contour Data** | Pole Vectors |
| **Maximum Density** | 17.63% |
| **Contour Distribution** | Fisher |
| **Counting Circle Size** | 1.0% |

| | |
|---|---|
| **Kinematic Analysis** | Flexural Toppling |
| **Slope Dip** | 70 |
| **Slope Dip Direction** | 270 |
| **Friction Angle** | 30° |
| **Lateral Limits** | 20° |

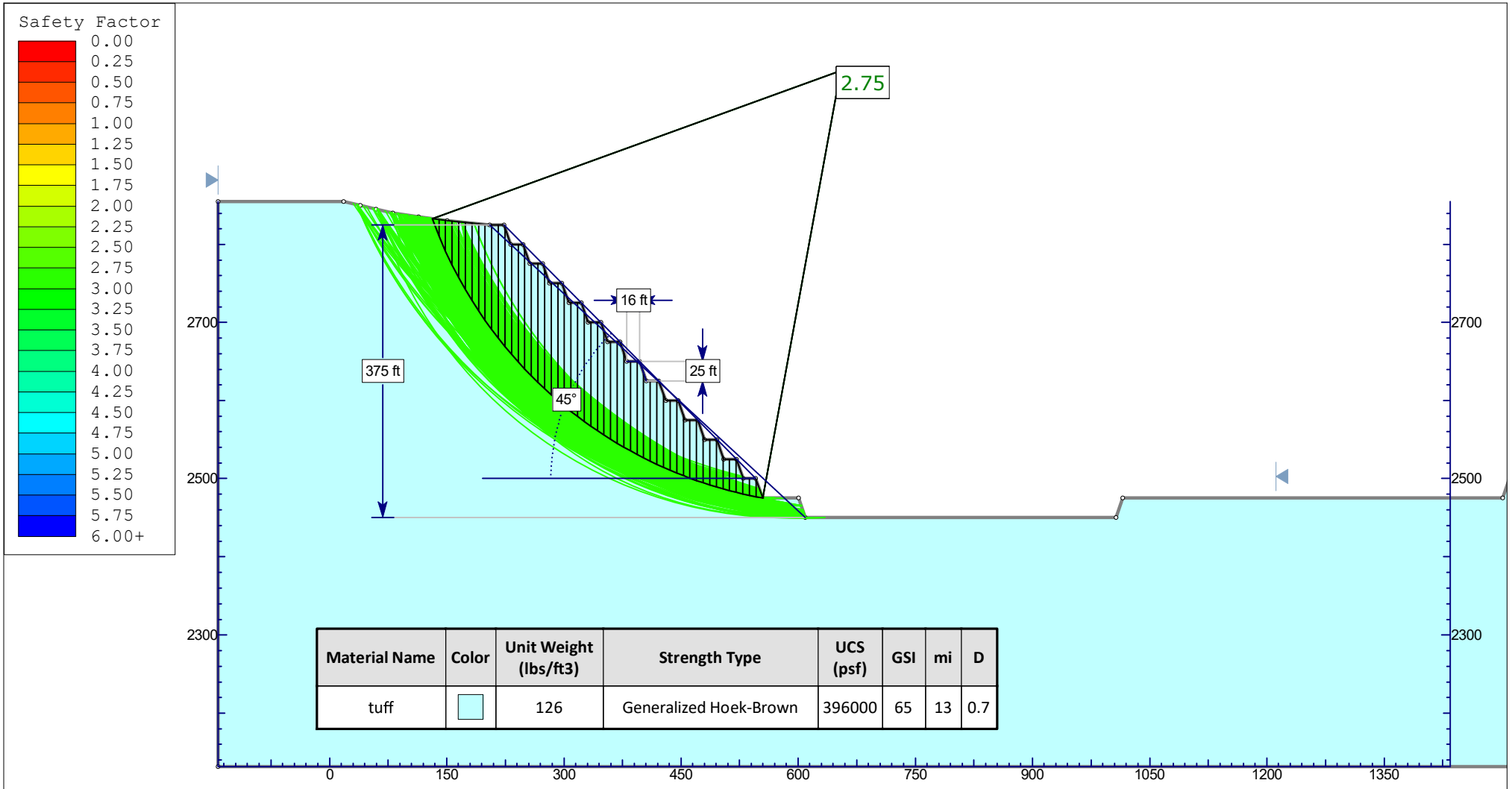
| | Critical | Total | % |
|---|---|---|---|
| Flexural Toppling (All) | 2 | 71 | 2.82% |
| Flexural Toppling (Set 4: joints) | 1 | 10 | 10.00% |

| | |
|---|---|
| **Plot Mode** | Pole Vectors |
| **Vector Count** | 71 (71 Entries) |
| **Intersection Mode** | Mean Set Planes |
| **Intersections Count** | 15 |
| **Hemisphere** | Lower |
| **Projection** | Equal Angle |

Terracon

DIPS 7.014

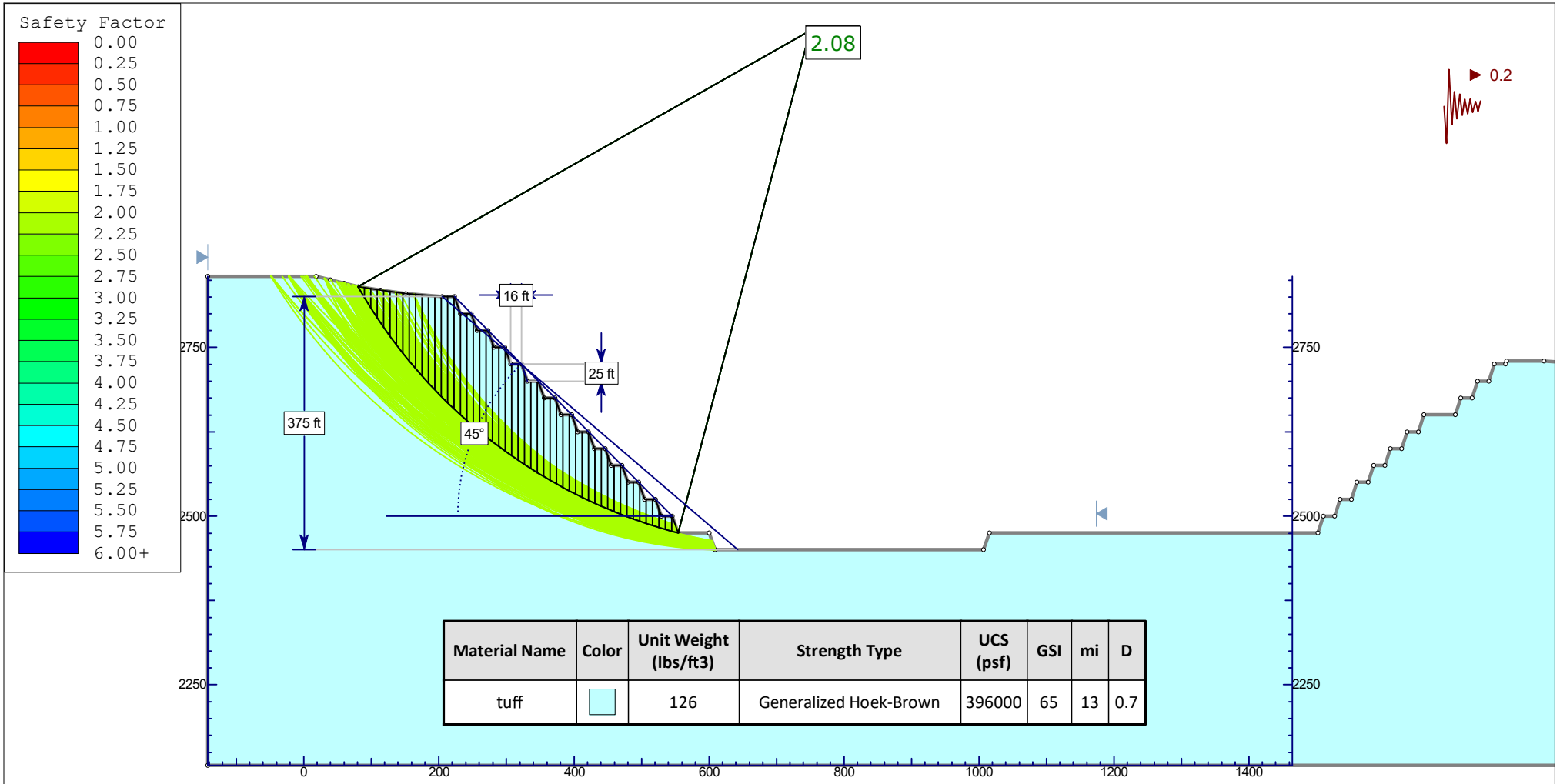
| | | | |
|---|---|---|---|
| *Project* | Gem Hill Pozzolan | | |
| *Analysis Description* | Kinematic | | |
| *Drawn By* | Terracon | *Author* | JMc |
| *File Name* | topple_Field and Google lineaments Data.dips7 | *Date* | 12/13/2019 |




| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | UCS (psf) | GSI | mi | D |
|---|---|---|---|---|---|---|---|
| tuff | | 126 | Generalized Hoek-Brown | 396000 | 65 | 13 | 0.7 |

| | | | |
|---|---|---|---|
| Terracon | *Project* | Gem Hill Quarry | |
| | *Analysis Description* | North Pit | |
| | *Drawn By* | JMc | *Company* Terracon |
| | *Date* | 12/20/2019, 7:04:59 AM | *File Name* Gem Hill sect A Slide1.slmd |

SLIDEINTERPRET 8.029

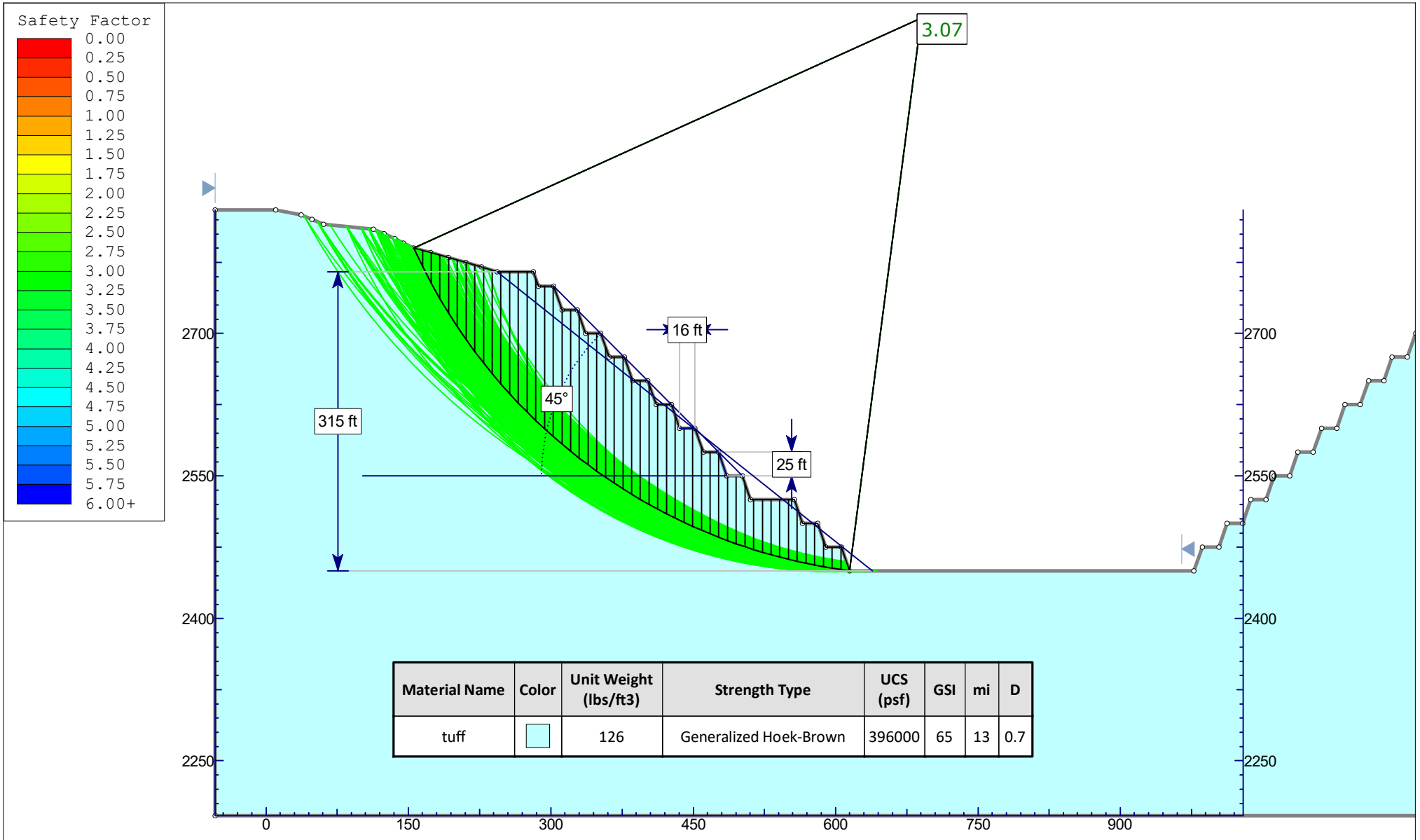



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | UCS (psf) | GSI | mi | D |
|---|---|---|---|---|---|---|---|
| tuff | | 126 | Generalized Hoek-Brown | 396000 | 65 | 13 | 0.7 |

Terracon

SLIDEINTERPRET 8.029

| | | | |
|---|---|---|---|
| Project | Gem Hill Quarry | | |
| Analysis Description | North Pit | | |
| Drawn By | JMc | Company | Terracon |
| Date | 12/20/2019, 7:04:59 AM | File Name | Gem Hill sect A Slide1.slmd |

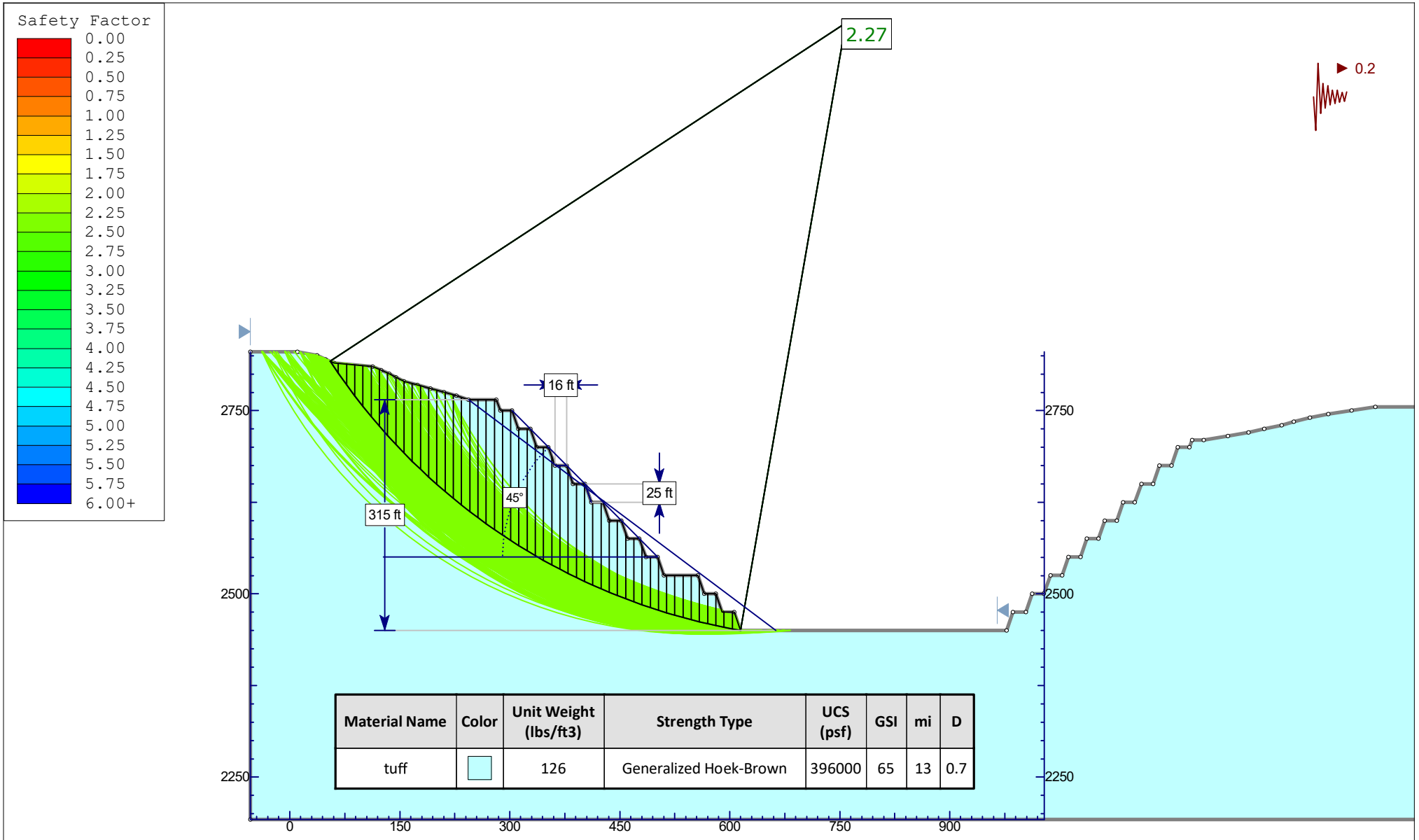



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | UCS (psf) | GSI | mi | D |
|---|---|---|---|---|---|---|---|
| tuff | | 126 | Generalized Hoek-Brown | 396000 | 65 | 13 | 0.7 |

Terracon

SLIDEINTERPRET 8.029

| | | | |
|---|---|---|---|
| Project | Gem Hill Quarry | | |
| Analysis Description | North Pit | | |
| Drawn By | JMc | Company | Terracon |
| Date | 12/20/2019, 7:27:21 AM | File Name | sect B Slide1.slmd |

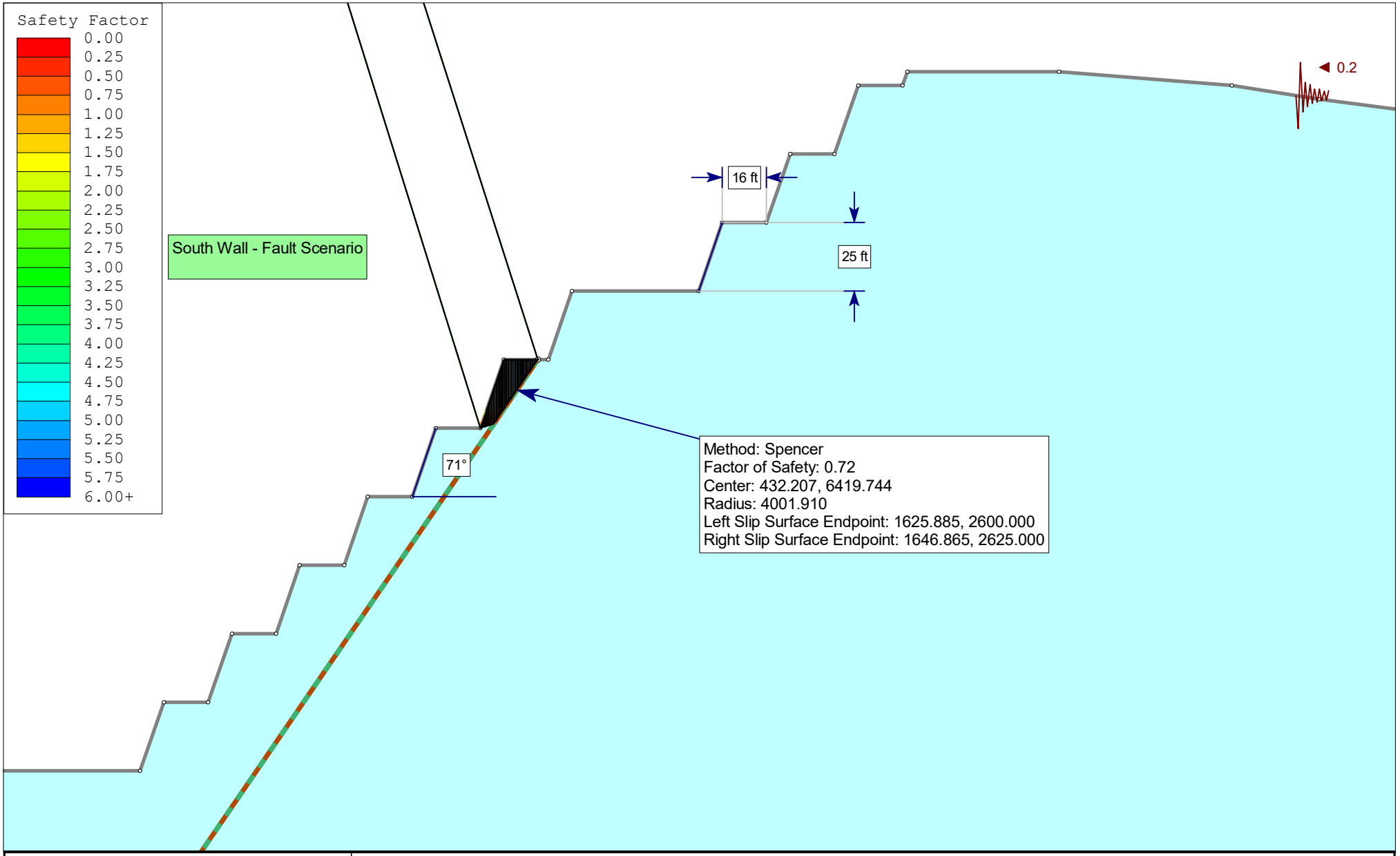



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | UCS (psf) | GSI | mi | D |
|---|---|---|---|---|---|---|---|
| tuff | | 126 | Generalized Hoek-Brown | 396000 | 65 | 13 | 0.7 |

Terracon

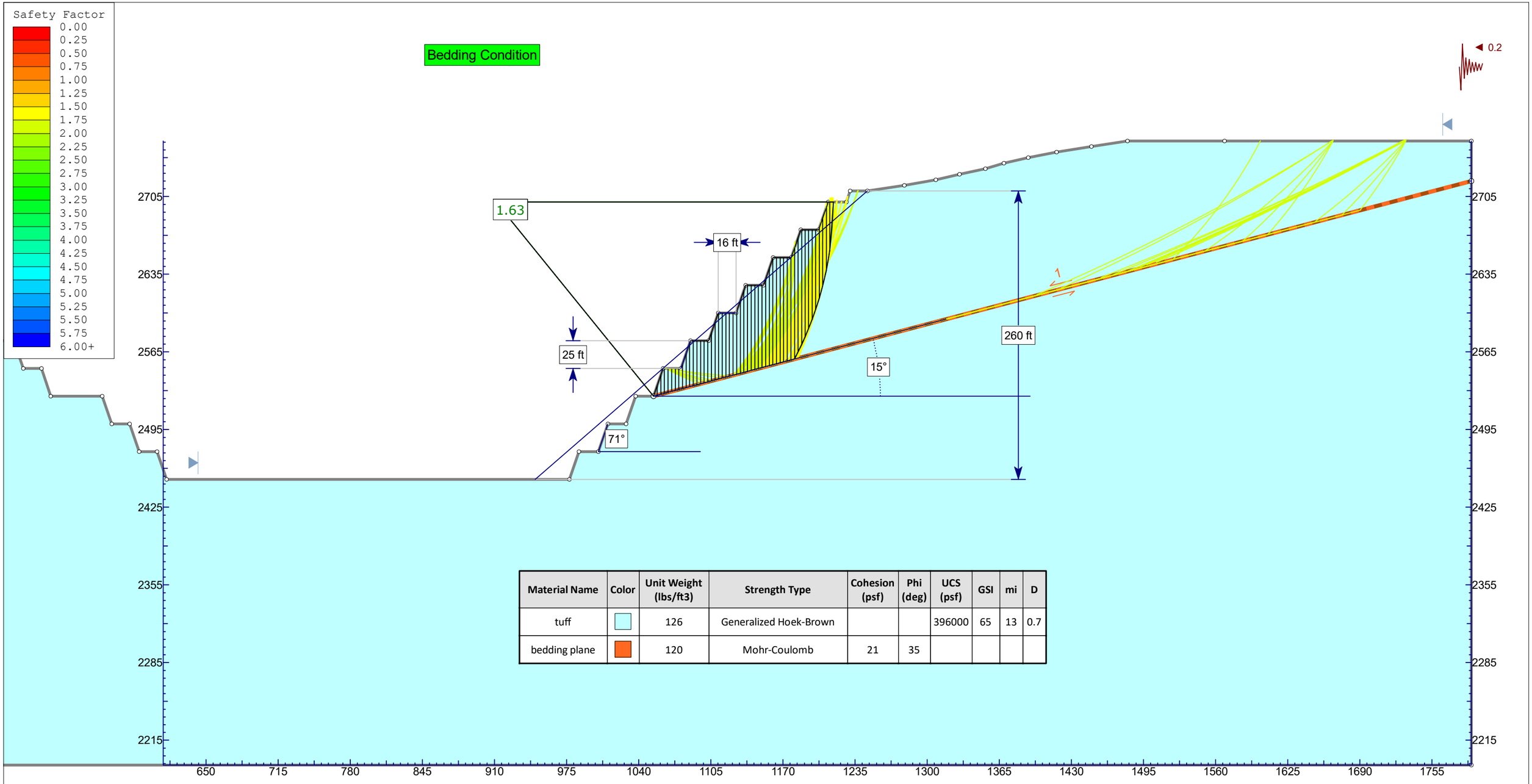
SLIDEINTERPRET 8.029

| | | | |
|---|---|---|---|
| Project | Gem Hill Quarry | | |
| Analysis Description | North Pit | | |
| Drawn By | JMc | Company | Terracon |
| Date | 12/20/2019, 7:27:21 AM | File Name | sect B Slide1.slmd |




| | | | |
|---|---|---|---|
| Terracon | Project | Gem Hill Quarry | |
| | Analysis Description | North Pit | |
| | Drawn By | JMc | Company: Terracon |
| | Date | 12/20/2019, 7:04:59 AM | File Name: Gem Hill sect A fault south end.slmd |

SLIDEINTERPRET 8.029

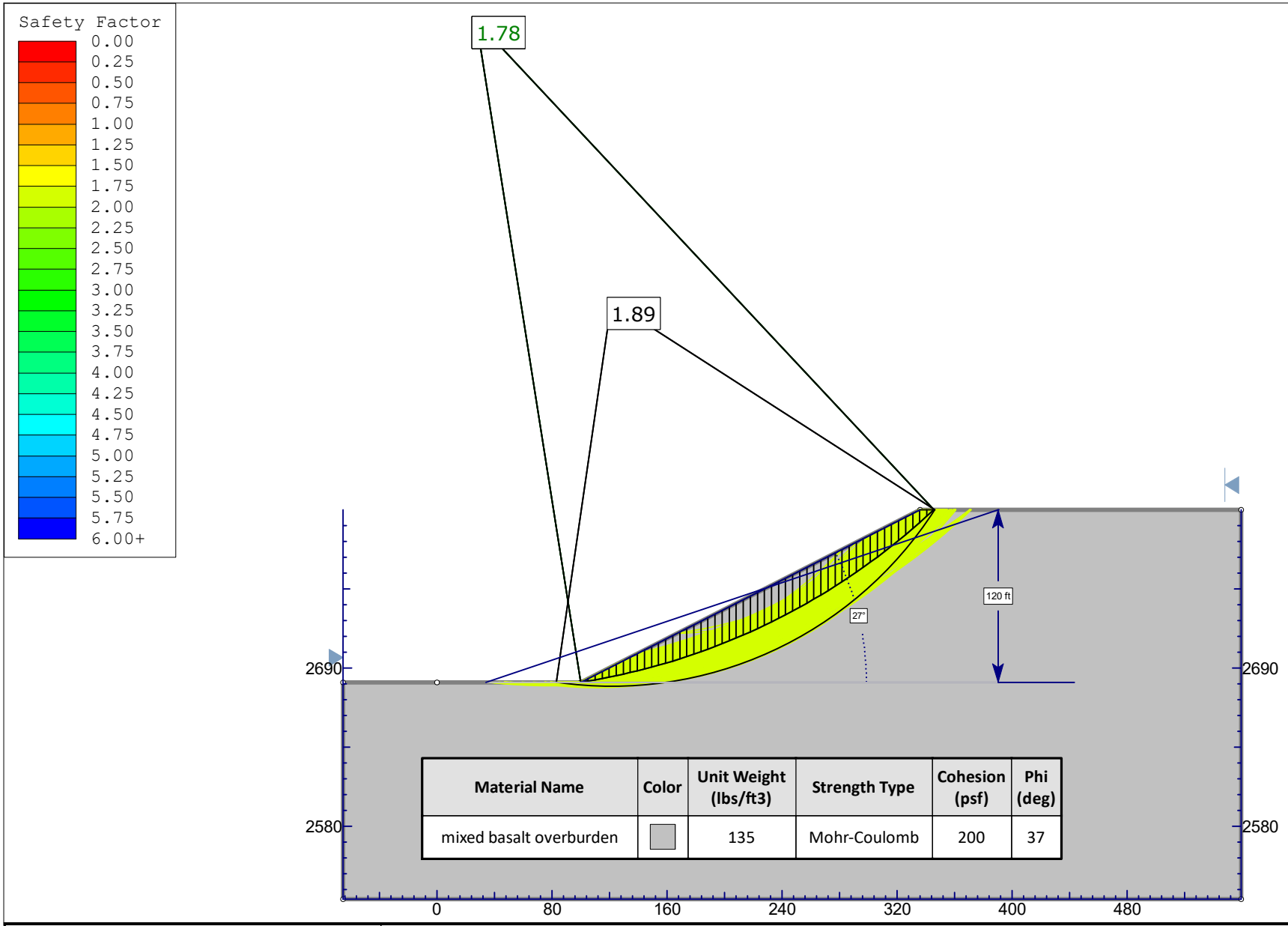



| Material Name | Color | Unit Weight (lbs/ft3) | Strength Type | Cohesion (psf) | Phi (deg) | UCS (psf) | GSI | mi | D |
|---|---|---|---|---|---|---|---|---|---|
| tuff | | 126 | Generalized Hoek-Brown | | | 396000 | 65 | 13 | 0.7 |
| bedding plane | | 120 | Mohr-Coulomb | 21 | 35 | | | | |

Terracon

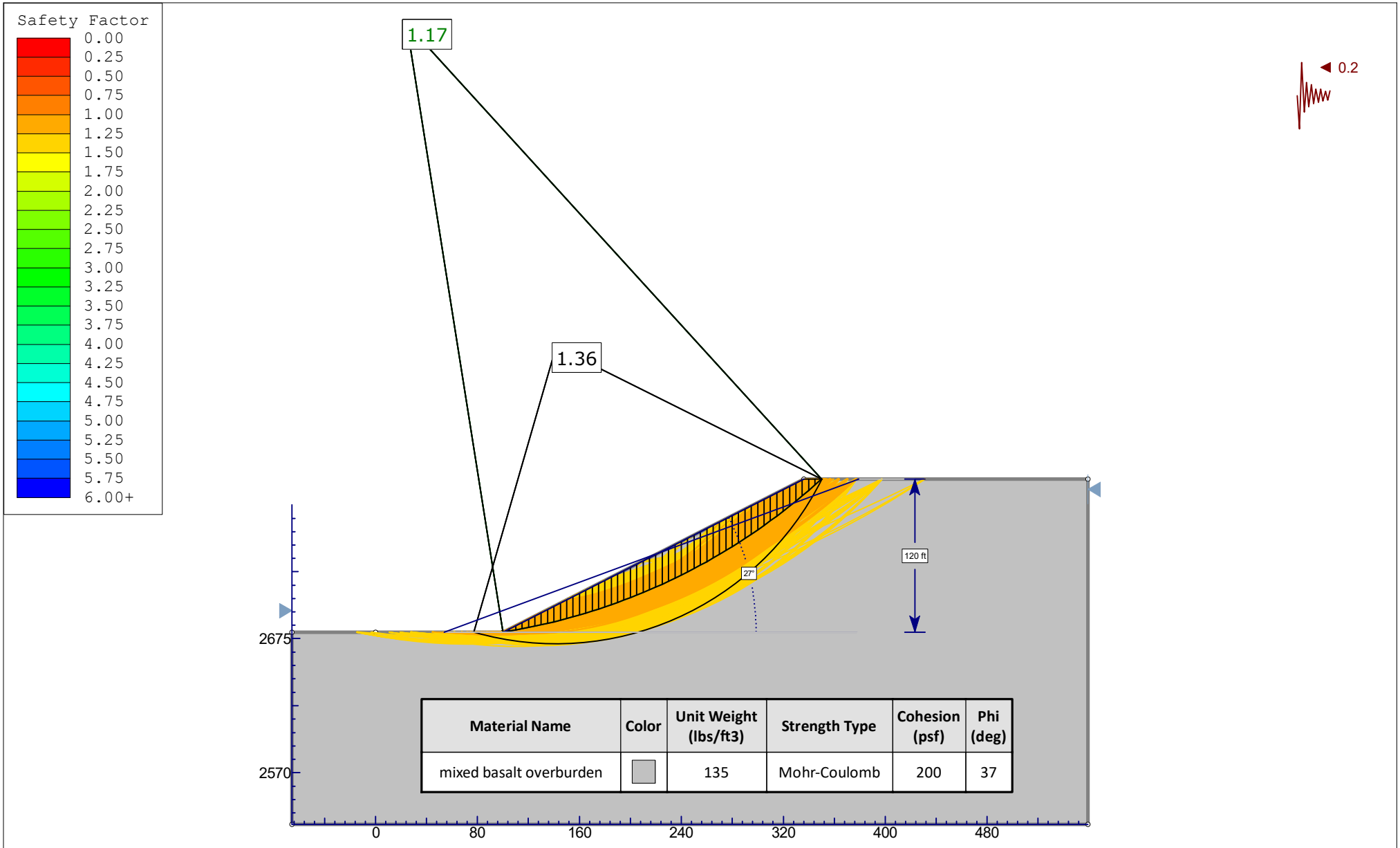
SLIDEINTERPRET 8.029

| | | | |
|---|---|---|---|
| *Project* | Gem Hill Quarry | | |
| *Analysis Description* | North Pit | | |
| *Drawn By* | JMc | *Company* | Terracon |
| *Date* | 12/20/2019, 7:27:21 AM | *File Name* | sect B beddin condition.slmd |




| | | | |
|---|---|---|---|
| Terracon | Project | Gem Hill Quarry | |
| | Analysis Description | OB Stockpile | |
| | Drawn By | JMc | Company: Terracon |
| | Date | | File Name: rev Gem Hill stockpile.slmd |

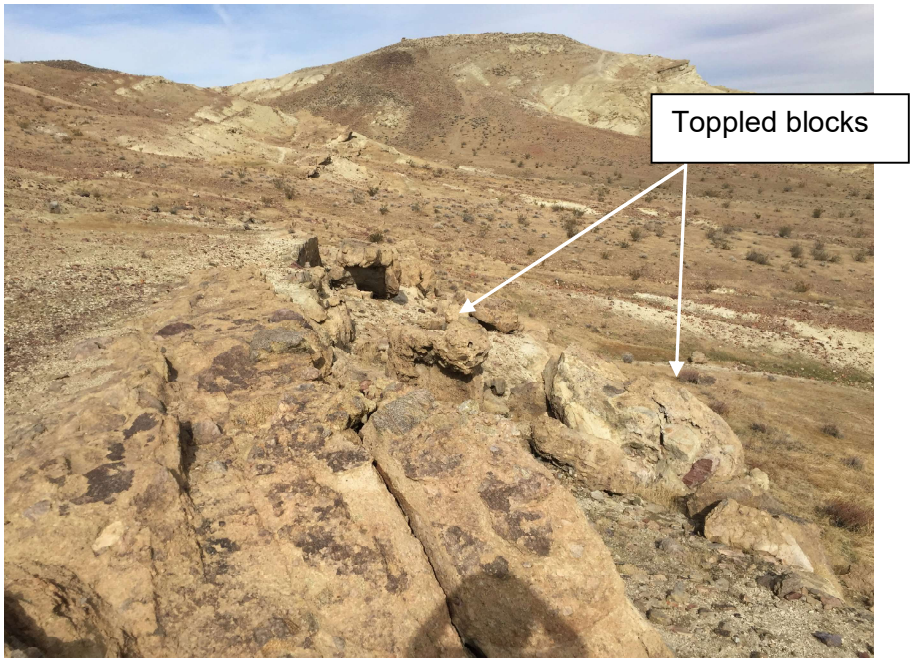
SLIDEINTERPRET 8.029




| | | | |
|---|---|---|---|
| Terracon | Project | Gem Hill Quarry | |
| | Analysis Description | OB Stockpile | |
| | Drawn By | JMc | Company: Terracon |
| | Date | | File Name: rev Gem Hill stockpile.slmd |

SLIDEINTERPRET 8.029

**PHOTOGRAPHY LOG**




Block topple below natural cliff from erosional undercut below resistant welded tuff bed.



Tuff outcrops showing southwest-dipping bedding. View is NW.



Tuff outcrop with sheets of exfoliated material as surface colluvium.



Surface of tuff unit showing fabric and grain size/shapes.



Conglomerate unit (Tgc) as channel fill onto Tuff unit (Tt).



Tuff outcrop with surface lag gravels and cobbles. View is N.

# DRILL HOLE LOGS

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R1 | 0 | 5 | 1 | tuf | | tuff with 3% rhyolite and minor chalcedony |
| R1 | 5 | 10 | 2 | tuf | | tuff with 3% rhyolite and minor chalcedony |
| R1 | 10 | 15 | 3 | tuf | | tuff with 2% rhyolite |
| R1 | 15 | 20 | 4 | tuf | | tuff with 7% rhyolite |
| R1 | 20 | 25 | 5 | tuf | | tuff with 3% rhyolite |
| R1 | 25 | 30 | 6 | tuf | | tuff with 1% rhyolite |
| R1 | 30 | 35 | 7 | tuf | | tuff with 5% rhyolite |
| R1 | 35 | 40 | 8 | tuf | | tuff with 3% rhyolite |
| R1 | 40 | 45 | 9 | tuf | | tuff with 2% rhyolite |
| R1 | 45 | 50 | 10 | tuf | | tuff with 3% rhyolite |
| R1 | 50 | 55 | 11 | tuf | | tuff with 5% rhyolite |
| R1 | 55 | 60 | 12 | tuf | | tuff with 7% rhyolite |
| R1 | 60 | 65 | 13 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R1 | 65 | 70 | 14 | tuf | | tuff with 2% rhyolite |
| R1 | 70 | 75 | 15 | tuf | | tuff with 2% rhyolite |
| R1 | 75 | 80 | 16 | tuf | | tuff with 2% rhyolite and 1% chalcedony |
| R1 | 80 | 85 | 17 | tuf | | tuff with 20% rhyolite |
| R1 | 85 | 90 | 18 | tuf | | tuff with 1% rhyolite |
| R1 | 90 | 95 | 19 | tuf | | tuff with 1% rhyolite and 1% chalcedony |
| R1 | 95 | 100 | 20 | tuf | | tuff with 1% rhyolite and 2% dacite |
| R1 | 100 | 105 | 21 | tuf | | tuff with 1% rhyolite and 1% chalcedony |
| R1 | 105 | 110 | 22 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R1 | 110 | 115 | 23 | tuf | | tuff with 3% rhyolite and 2% chalcedony |
| R1 | 115 | 120 | 24 | tuf | | tuff with 3% rhyolite and 2% chalcedony |
| R1 | 120 | 125 | 25 | tuf | | tuff with 3% rhyolite and 2% chalcedony |
| R1 | 125 | 130 | 26 | tuf | | tuff with 20% dacite and 1% chalcedony |
| R1 | 130 | 135 | 27 | tuf | | tuff with 1% rhyolite |
| R1 | 135 | 140 | 28 | tuf | | tuff with 12% rhyolite and 2% chalcedony |
| R1 | 140 | 145 | 29 | tuf | | tuff with 1% rhyolite |
| R1 | 145 | 150 | 30 | tuf | | tuff with 2% chalcedony |
| R1 | 150 | 155 | 31 | tuf | | tuff with 1% rhyolite |
| R1 | 155 | 160 | 32 | tuf | | tuff with 1% rhyolite |
| R1 | 160 | 165 | 33 | tuf | | tuff with 3% dacite and 1% chalcedony |
| R1 | 165 | 170 | 34 | tuf | | tuff with 1% dacite 1% rhyolite and 1% chalcedony |
| R1 | 170 | 175 | 35 | tuf | | tuff with 3% dacite and 2% chalcedony |
| R1 | 175 | 180 | 36 | tuf | | tuff with 3% dacite and 2% chalcedony |
| R1 | 180 | 185 | 37 | tuf | | tuff with 5% dacite and 1% chalcedony |
| R1 | 185 | 190 | 38 | tuf | | tuff with 2% dacite and 1% chalcedony |
| R1 | 190 | 195 | 39 | tuf | | tuff with 2% dacite 1% rhyolite and 1% chalcedony |
| R1 | 195 | 200 | 40 | tuf | | tuff with 2% dacite and 1% chalcedony |
| R1 | 200 | 205 | 41 | tuf | | tuff |
| R1 | 205 | 210 | 42 | tuf | | tuff with 3% dacite and 1% chalcedony |
| R1 | 210 | 215 | 43 | tuf | | tuff with 5% dacite |
| R1 | 215 | 220 | 44 | tuf | | tuff with 5% dacite and 1% chalcedony |
| R1 | 220 | 225 | 45 | tuf | | tuff with 3% dacite |
| R1 | 225 | 230 | 46 | tuf | | tuff with 3% dacite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R1 | 230 | 235 | 47 | tuf | | tuff with 1% rhyolite and 1% chalcedony |
| R1 | 235 | 240 | 48 | tuf | | tuff with 2% chalcedony |
| R1 | 240 | 245 | 49 | tuf | | tuff with 7% chalcedony |
| R1 | 245 | 250 | 50 | tuf | | tuff with 7% chalcedony |
| R1 | 250 | 255 | 51 | gmon | | grano-monzonite |
| R1 | 255 | 260 | 52 | gmon | | grano-monzonite |
| R1 | 260 | 265 | 53 | gmon | | grano-monzonite |
| R1 | 265 | 270 | 54 | gmon | | grano-monzonite |
| R1 | 270 | 275 | 55 | gmon | | grano-monzonite |
| R1 | 275 | 280 | 56 | gmon | | grano-monzonite |
| R1 | 280 | 285 | 57 | gmon | | grano-monzonite |
| R1 | 285 | 290 | 58 | gmon | | grano-monzonite |
| R10 | 0 | 5 | 1 | tuf | | tuff |
| R10 | 5 | 10 | 2 | tuf | | tuff |
| R10 | 10 | 15 | 3 | tuf | | tuff with heavy brown clay |
| R10 | 15 | 20 | 4 | tuf | | tuff with heavy brown clay |
| R10 | 20 | 25 | 5 | tuf | | tuff |
| R10 | 25 | 30 | 6 | tuf | | tuff with heavy celadonite clay |
| R10 | 30 | 35 | 7 | tuf | | tuff with heavy celadonite clay |
| R10 | 35 | 40 | 8 | tuf | | tuff |
| R10 | 40 | 45 | 9 | tuf | | tuff with heavy celadonite clay |
| R10 | 45 | 50 | 10 | tuf | | tuff with heavy celadonite clay |
| R10 | 50 | 55 | 11 | tuf | | tuff with heavy celadonite clay |
| R10 | 55 | 60 | 12 | tuf | | tuff |
| R10 | 60 | 65 | 13 | tuf | | tuff with heavy celadonite clay |
| R10 | 65 | 70 | 14 | tuf | | tuff |
| R10 | 70 | 75 | 15 | tuf | | tuff with 5% rhyolite |
| R10 | 75 | 80 | 16 | tuf | | tuff with 5% rhyolite and heavy celadonite clay |
| R10 | 80 | 85 | 17 | tuf | | tuff |
| R10 | 85 | 90 | 18 | tuf | | tuff |
| R10 | 90 | 95 | 19 | tuf | | tuff |
| R10 | 95 | 100 | 20 | tuf | | tuff with heavy celadonite clay |
| R10 | 100 | 105 | 21 | tuf | | tuff with heavy celadonite clay |
| R10 | 105 | 110 | 22 | tuf | | tuff with heavy celadonite clay |
| R10 | 110 | 115 | 23 | tuf | | tuff with heavy celadonite clay |
| R10 | 115 | 120 | 24 | tuf | | tuff with heavy celadonite clay then hydrothermally filled fracture |
| R10 | 120 | 125 | 25 | flt | | hydrothermally filled fracture |
| R10 | 125 | 130 | 26 | flt | | hydrothermally filled fracture |
| R10 | 130 | 135 | 27 | tuf | | tuff with brown clay |
| R10 | 135 | 140 | 28 | tuf | | tuff with heavy celadonite clay |
| R10 | 140 | 145 | 29 | tuf | | tuff with heavy celadonite clay |
| R10 | 145 | 150 | 30 | tuf | | tuff with heavy celadonite clay |
| R10 | 150 | 155 | 31 | tuf | | tuff |
| R10 | 155 | 160 | 32 | tuf | | tuff with heavy celadonite clay |
| R10 | 160 | 165 | 33 | tuf | | tuff with heavy celadonite clay |
| R10 | 165 | 170 | 34 | tuf | | tuff with heavy celadonite clay |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R10 | 170 | 175 | 35 | tuf | | tuff with heavy celadonite clay |
| R10 | 175 | 180 | 36 | tuf | | tuff in moderate brown clay |
| R10 | 180 | 185 | 37 | gmon | | grano-monzonite in gray clay |
| R10 | 185 | 190 | 38 | gmon | | grano-monzonite in gray clay |
| R10 | 190 | 195 | 39 | gmon | | grano-monzonite in gray clay |
| R10 | 195 | 200 | 40 | gmon | | grano-monzonite |
| R10 | 200 | 205 | 41 | gmon | | grano-monzonite |
| R10 | 205 | 210 | 42 | gmon | | grano-monzonite |
| R11 | 0 | 5 | 1 | tuf | | tuff with 15% rhyolite and light celadonite clay |
| R11 | 5 | 10 | 2 | tuf | | tuff with 15% rhyolite and light celadonite clay |
| R11 | 10 | 15 | 3 | tuf | | tuff with 20% rhyolite and heavy celadonite clay |
| R11 | 15 | 20 | 4 | tuf | | tuff with 7% rhyolite and heavy celadonite clay |
| R11 | 20 | 25 | 5 | tuf | | tuff with 10% rhyolite and light celadonite clay |
| R11 | 25 | 30 | 6 | tuf | | tuff with 10% rhyolite and light celadonite clay |
| R11 | 30 | 35 | 7 | tuf | | tuff with 15% rhyolite and heavy celadonite clay |
| R11 | 35 | 40 | 8 | tuf | | tuff with 25% rhyolite and light celadonite clay |
| R11 | 40 | 45 | 9 | tuf | | tuff with 5% rhyolite and light celadonite clay |
| R11 | 45 | 50 | 10 | tuf | | tuff with 5% rhyolite and light celadonite clay |
| R11 | 50 | 55 | 11 | tuf | | tuff with 10% rhyolite 1% chalcedony and light celadonite clay |
| R11 | 55 | 60 | 12 | tuf | | tuff with 5% rhyolite and light celadonite clay |
| R11 | 60 | 65 | 13 | tuf | | tuff with 8% rhyolite and light celadonite clay |
| R11 | 65 | 70 | 14 | tuf | | tuff with 3% rhyolite and light celadonite clay |
| R11 | 70 | 75 | 15 | tuf | | tuff with 7% rhyolite and light celadonite clay |
| R11 | 75 | 80 | 16 | tuf | | tuff with 5% rhyolite and light celadonite clay |
| R11 | 80 | 85 | 17 | tuf | | tuff with 7% rhyolite |
| R11 | 85 | 90 | 18 | tuf | | tuff with 5% rhyolite and light celadonite clay |
| R11 | 90 | 95 | 19 | tuf | | tuff with 3% rhyolite and heavy celadonite clay |
| R11 | 95 | 100 | 20 | tuf | | tuff with 3% rhyolite and heavy celadonite clay |
| R11 | 100 | 105 | 21 | tuf | | tuff with 3% rhyolite and heavy celadonite clay |
| R11 | 105 | 110 | 22 | tuf | | tuff with 20% rhyolite 1% dacite and heavy celadonite clay |
| R11 | 110 | 115 | 23 | tuf | | tuff with 5% rhyolite and 3% dacite |
| R11 | 115 | 120 | 24 | tuf | | tuff with 20% rhyolite |
| R11 | 120 | 125 | 25 | tuf | | tuff with 5% rhyolite |
| R11 | 125 | 130 | 26 | tuf | | tuff with 5% rhyolite and light clay |
| R11 | 130 | 135 | 27 | lahr | | lahar with 50% rhyolite |
| R11 | 135 | 140 | 28 | lahr | | lahar with 50% rhyolite and heavy clay |
| R11 | 140 | 145 | 29 | tuff | | tuff with 1% rhyolite |
| R11 | 145 | 150 | 30 | tuff | | tuff |
| R11 | 150 | 155 | 31 | tuff | | tuff |
| R11 | 155 | 160 | 32 | tuff | | tuff |
| R11 | 160 | 165 | 33 | tuff | | tuff |
| R11 | 165 | 170 | 34 | tuff | | tuff |
| R11 | 170 | 175 | 35 | bas | | basalt |
| R11 | 175 | 180 | 36 | bas | | basalt |
| R11 | 180 | 185 | 37 | bas | | basalt |
| R11 | 185 | 190 | 38 | bas | | basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R12 | 0 | 5 | 1 | tuf | | tuff with 3% rhyolite |
| R12 | 5 | 10 | 2 | tuf | | tuff with 3% rhyolite |
| R12 | 10 | 15 | 3 | tuf | | tuff with 3% rhyolite and 2% chalcedony |
| R12 | 15 | 20 | 4 | tuf | | tuff with 10% rhyolite |
| R12 | 20 | 25 | 5 | tuf | | tuff with 20% rhyolite |
| R12 | 25 | 30 | 6 | tuf | | tuff with 20% rhyolite |
| R12 | 30 | 35 | 7 | tuf | | tuff with 10% rhyolite and 1% opal |
| R12 | 35 | 40 | 8 | lahr | | lahar with 40% rhyolite |
| R12 | 40 | 45 | 9 | lahr | | lahar with 40% rhyolite |
| R12 | 45 | 50 | 10 | lahr | | lahar with 25% rhyolite and 1% chalcedony |
| R12 | 50 | 55 | 11 | lahr | | lahar with 25% rhyolite and 1% chalcedony |
| R12 | 55 | 60 | 12 | lahr | | lahar with 25% rhyolite and 1% chalcedony |
| R12 | 60 | 65 | 13 | lahr | | lahar with 30% rhyolite |
| R12 | 65 | 70 | 14 | lahr | | lahar with 30% rhyolite and 2% chalcedony |
| R12 | 70 | 75 | 15 | lahr | | lahar with 25% rhyolite and 1% opal |
| R12 | 75 | 80 | 16 | lahr | | lahar with 50% rhyolite |
| R12 | 80 | 85 | 17 | lahr | | lahar with 50% rhyolite |
| R12 | 85 | 90 | 18 | lahr | | lahar with 40% rhyolite |
| R12 | 90 | 95 | 19 | lahr | | lahar with 40% rhyolite |
| R12 | 95 | 100 | 20 | lahr | | lahar with 20% rhyolite and 2% chalcedony |
| R12 | 100 | 105 | 21 | lahr | | lahar with 30% rhyolite and 1% chalcedony |
| R12 | 105 | 110 | 22 | lahr | | lahar with 30% rhyolite and 1% chalcedony |
| R12 | 110 | 115 | 23 | lahr | | lahar with 20% rhyolite |
| R12 | 115 | 120 | 24 | lahr | | lahar with 30% rhyolite |
| R12 | 120 | 125 | 25 | lahr | | lahar with 30% rhyolite |
| R12 | 125 | 130 | 26 | tuf | | tuff with 10% rhyolite |
| R12 | 130 | 135 | 27 | tuf | | tuff with 15% rhyolite and 1% chalcedony |
| R12 | 135 | 140 | 28 | tuf | | tuff with 1% rhyolite |
| R12 | 140 | 145 | 29 | tuf | | tuff with 10% rhyolite |
| R12 | 145 | 150 | 30 | lahr | | lahar with 35% rhyolite and 3% chalcedony |
| R12 | 150 | 155 | 31 | lahr | | lahar with 35% rhyolite and 1% chacledony |
| R12 | 155 | 160 | 32 | lahr | | lahar with 15% rhyolite |
| R12 | 160 | 165 | 33 | tuf | | tuff with 5% rhyolite |
| R12 | 165 | 170 | 34 | tuf | | tuff with 5% rhyolite |
| R12 | 170 | 175 | 35 | tuf | | tuff with 5% rhyolite |
| R12 | 175 | 180 | 36 | tuf | | tuff with 5% rhyolite |
| R12 | 180 | 185 | 37 | tuf | | tuff with 5% rhyolite |
| R12 | 185 | 190 | 38 | tuf | | tuff with 5% rhyolite and heavy clay |
| R12 | 190 | 195 | 39 | bas | | basalt with celadonite filled vesicles |
| R12 | 195 | 200 | 40 | bas | | basalt |
| R12 | 200 | 205 | 41 | bas | | basalt |
| R12 | 205 | 210 | 42 | bas | | basalt |
| R12 | 210 | 215 | 43 | bas | | basalt |
| R12 | 215 | 220 | 44 | bas | | basalt |
| R12 | 220 | 225 | 45 | bas | | basalt |
| R12 | 225 | 230 | 46 | bas | | basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R12 | 230 | 235 | 47 | bas | | basalt |
| R12 | 235 | 240 | 48 | bas | | basalt |
| R12 | 240 | 245 | 49 | bas | | basalt |
| R12 | 245 | 250 | 50 | bas | | basalt |
| R12 | 250 | 255 | 51 | bas | | basalt |
| R12 | 255 | 260 | 52 | bas | | basalt |
| R12 | 260 | 265 | 53 | bas | | basalt |
| R12 | 265 | 270 | 54 | bas | | basalt |
| R12 | 270 | 275 | 55 | bas | | basalt |
| R12 | 275 | 280 | 56 | bas | | basalt |
| R12 | 280 | 285 | 57 | bas | | basalt |
| R12 | 285 | 290 | 58 | bas | | basalt |
| R12 | 290 | 295 | 59 | bas | | basalt |
| R12 | 295 | 300 | 60 | bas | | basalt |
| R12 | 300 | 305 | 61 | bas | | basalt |
| R12 | 305 | 310 | 62 | bas | | basalt with minor iron oxides |
| R12 | 310 | 315 | 63 | bas | | basalt with moderate iron oxides |
| R12 | 315 | 320 | 64 | bas | | basalt with major iron oxides |
| R12 | 320 | 325 | 65 | tuf | | tuff with 10% rhyolite and iron oxides |
| R12 | 325 | 330 | 66 | tuf | | tuff with 10% rhyolite and iron oxides |
| R13 | 0 | 5 | 1 | tuf | | tuff with 5% rhyolite |
| R13 | 5 | 10 | 2 | tuf | | tuff with 5% rhyolite |
| R13 | 10 | 15 | 3 | tuf | | tuff with 1% rhyolite |
| R13 | 15 | 20 | 4 | tuf | | tuff with 50% rhyolite |
| R13 | 20 | 25 | 5 | tuf | | tuff with 2% rhyolite |
| R13 | 25 | 30 | 6 | tuf | | tuff with 5% rhyolite |
| R13 | 30 | 35 | 7 | tuf | | tuff with 5% rhyolite |
| R13 | 35 | 40 | 8 | lahr | | lahar with 20% rhyolite |
| R13 | 40 | 45 | 9 | lahr | | lahar with 20% rhyolite |
| R13 | 45 | 50 | 10 | lahr | | lahar with 30% rhyolite |
| R13 | 50 | 55 | 11 | lahr | | lahar with 55% rhyolite |
| R13 | 55 | 60 | 12 | lahr | | lahar with 50% rhyolite |
| R13 | 60 | 65 | 13 | lahr | | lahar with 25% rhyolite |
| R13 | 65 | 70 | 14 | lahr | | lahar with 19% rhyolite and 1% chalcedony |
| R13 | 70 | 75 | 15 | lahr | | lahar with 19% rhyolite |
| R13 | 75 | 80 | 16 | lahr | | lahar with 34% rhyolite and 1% chalcedony |
| R13 | 80 | 85 | 17 | lahr | | lahar with 34% rhyolite |
| R13 | 85 | 90 | 18 | lahr | | lahar with 34% rhyolite |
| R13 | 90 | 95 | 19 | lahr | | lahar with 10% rhyolite |
| R13 | 95 | 100 | 20 | lahr | | lahar with 60% rhyolite |
| R13 | 100 | 105 | 21 | lahr | | lahar with 20% rhyolite |
| R13 | 105 | 110 | 22 | lahr | | lahar with 20% rhyolite and 3% opal |
| R13 | 110 | 115 | 23 | lahr | | lahar with 20% rhyolite |
| R13 | 115 | 120 | 24 | lahr | | lahar with 20% rhyolite |
| R13 | 120 | 125 | 25 | lahr | | lahar with 40% rhyolite |
| R13 | 125 | 130 | 26 | lahr | | lahar with 40% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R13 | 130 | 135 | 27 | lahr | | lahar with 40% rhyolite and 1% opal |
| R13 | 135 | 140 | 28 | lahr | | lahar with 40% rhyolite |
| R13 | 140 | 145 | 29 | lahr | | lahar with 40% rhyolite |
| R13 | 145 | 150 | 30 | lahr | | lahar with 30% rhyolite |
| R13 | 150 | 155 | 31 | lahr | | lahar with 40% rhyolite and 1% chalcedony |
| R13 | 155 | 160 | 32 | tuf | | tuff with 10% rhyolite |
| R13 | 160 | 165 | 33 | tuf | | tuff with 20% rhyolite |
| R13 | 165 | 170 | 34 | tuf | | tuff with 20% rhyolite |
| R13 | 170 | 175 | 35 | tuf | | tuff with 20% rhyolite |
| R13 | 175 | 180 | 36 | tuf | | tuff with 1% rhyolite |
| R13 | 180 | 185 | 37 | tuf | | tuff with 1% rhyolite |
| R13 | 185 | 190 | 38 | tuf | | tuff with 1% rhyolite |
| R13 | 190 | 195 | 39 | tuf | | tuff with 1% rhyolite |
| R13 | 195 | 200 | 40 | tuf | | tuff with 1% rhyolite |
| R13 | 200 | 205 | 41 | tuf | | tuff with 5% rhyolite |
| R13 | 205 | 210 | 42 | tuf | | tuff with 20% basalt |
| R13 | 210 | 215 | 43 | bas | | basalt with 2% tuff |
| R13 | 215 | 220 | 44 | bas | | basalt with 1% tuff |
| R13 | 220 | 225 | 45 | bas | | basalt |
| R13 | 225 | 230 | 46 | bas | | basalt |
| R13 | 230 | 235 | 47 | bas | | basalt |
| R13 | 235 | 240 | 48 | bas | | basalt |
| R13 | 240 | 245 | 49 | bas | | basalt |
| R13 | 245 | 250 | 50 | bas | | basalt |
| R13 | 250 | 255 | 51 | bas | | basalt |
| R13 | 255 | 260 | 52 | bas | | basalt |
| R13 | 260 | 265 | 53 | bas | | basalt |
| R13 | 265 | 270 | 54 | bas | | basalt |
| R13 | 270 | 275 | 55 | bas | | basalt |
| R13 | 275 | 280 | 56 | bas | | basalt |
| R13 | 280 | 285 | 57 | bas | | basalt |
| R13 | 285 | 290 | 58 | bas | | basalt |
| R13 | 290 | 295 | 59 | bas | | basalt |
| R13 | 295 | 300 | 60 | bas | | basalt |
| R14 | 0 | 5 | 1 | tuf | | white tuff |
| R14 | 5 | 10 | 2 | tuf | | white tuff |
| R14 | 10 | 15 | 3 | tuf | | tuff with 10% rhyolite |
| R14 | 15 | 20 | 4 | tuf | | tuff with 1% rhyolite |
| R14 | 20 | 25 | 5 | tuf | | tuff with 5% rhyolite |
| R14 | 25 | 30 | 6 | tuf | | tuff with 10% rhyolite |
| R14 | 30 | 35 | 7 | tuf | | tuff with 5% rhyolite |
| R14 | 35 | 40 | 8 | tuf | | tuff with 5% rhyolite |
| R14 | 40 | 45 | 9 | tuf | | tuff with 5% rhyolite |
| R14 | 45 | 50 | 10 | tuf | | tuff with 5% rhyolite |
| R14 | 50 | 55 | 11 | tuf | | tuff with 10% rhyolite |
| R14 | 55 | 60 | 12 | tuf | | tuff with 10% rhyolite and heavy celadonite clay |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R14 | 60 | 65 | 13 | tuf | | tuff with 15% rhyolite and 1% chalcedony |
| R14 | 65 | 70 | 14 | tuf | | tuff with 1% rhyolite and 1% chalcedony |
| R14 | 70 | 75 | 15 | tuf | | tuff with 1% rhyolite and heavy celadonite clay |
| R14 | 75 | 80 | 16 | tuf | | tuff with 1% rhyolite and heavy celadonite clay |
| R14 | 80 | 85 | 17 | tuf | | tuff with 5% rhyolite and 2% chalcedony |
| R14 | 85 | 90 | 18 | tuf | | tuff with 5% rhyolite and 2% chalcedony |
| R14 | 90 | 95 | 19 | tuf | | tuff with 5% rhyolite and heavy clay |
| R14 | 95 | 100 | 20 | tuf | | tuff with 5% rhyolite and heavy clay |
| R14 | 100 | 105 | 21 | tuf | | tuff with heavy clay |
| R14 | 105 | 110 | 22 | tuf | | tuff with heavy clay |
| R14 | 110 | 115 | 23 | tuf | | tuff with heavy clay |
| R14 | 115 | 120 | 24 | tuf | | tuff with 5% chalcedony and heavy clay |
| R14 | 120 | 125 | 25 | tuf | | tuff |
| R14 | 125 | 130 | 26 | tuf | | tuff and hydrothermally filled fracture |
| R14 | 130 | 135 | 27 | tuf | | tuff |
| R14 | 135 | 140 | 28 | tuf | | tuff with 1% rhyolite |
| R14 | 140 | 145 | 29 | tuf | | tuff with 3% rhyolite |
| R14 | 145 | 150 | 30 | flt | | hydrothermally filled fracture |
| R14 | 150 | 155 | 31 | tuf | | tuff with light clay |
| R14 | 155 | 160 | 32 | tuf | | tuff with more hydrothermally filled fracture and light clay |
| R14 | 160 | 165 | 33 | tuf | | tuff with 1% rhyolite |
| R14 | 165 | 170 | 34 | tuf | | tuff with light clay |
| R14 | 170 | 175 | 35 | tuf | | tuff with heavy clay |
| R14 | 175 | 180 | 36 | tuf | | tuff with heavy celadonite clay |
| R14 | 180 | 185 | 37 | tuf | | tuff |
| R14 | 185 | 190 | 38 | tuf | | tuff |
| R14 | 190 | 195 | 39 | tuf | | tuff |
| R14 | 195 | 200 | 40 | tuf | | tuff |
| R14 | 200 | 205 | 41 | tuf | | tuff |
| R14 | 205 | 210 | 42 | tuf | | tuff |
| R14 | 210 | 215 | 43 | tuf | | tuff |
| R14 | 215 | 220 | 44 | tuf | | tuff |
| R14 | 220 | 225 | 45 | gmon | | grano-monzonite |
| R14 | 225 | 230 | 46 | gmon | | grano-monzonite |
| R15 | 0 | 5 | 1 | tuf | | tuff |
| R15 | 5 | 10 | 2 | tuf | | tuff |
| R15 | 10 | 15 | 3 | tuf | | tuff with 7% rhyolite and light clay |
| R15 | 15 | 20 | 4 | tuf | | tuff with 7% rhyolite and light clay |
| R15 | 20 | 25 | 5 | tuf | | tuff with 8% rhyolite and light clay |
| R15 | 25 | 30 | 6 | tuf | | tuff with 8% rhyolite and light clay |
| R15 | 30 | 35 | 7 | tuf | | tuff with 3% rhyolite and heavy clay |
| R15 | 35 | 40 | 8 | tuf | | tuff with 3% rhyolite and heavy clay |
| R15 | 40 | 45 | 9 | tuf | | tuff with 5% rhyolite |
| R15 | 45 | 50 | 10 | tuf | | tuff with 5% rhyolite |
| R15 | 50 | 55 | 11 | tuf | | tuff with 5% rhyolite |
| R15 | 55 | 60 | 12 | lahr | | lahar with 35% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R15 | 60 | 65 | 13 | lahr | | lahar with 35% rhyolite |
| R15 | 65 | 70 | 14 | tuf | | tuff with 2% rhyolite and heavy clay |
| R15 | 70 | 75 | 15 | tuf | | tuff with 3% rhyolite |
| R15 | 75 | 80 | 16 | tuf | | tuff with 3% rhyolite |
| R15 | 80 | 85 | 17 | tuf | | tuff with 19% rhyolite |
| R15 | 85 | 90 | 18 | tuf | | tuff with 7% dacite and 1% rhyolite |
| R15 | 90 | 95 | 19 | tuf | | tuff with 7% dacite and 1% rhyolite |
| R15 | 95 | 100 | 20 | tuf | | tuff with 2% dacite and 1% rhyolite |
| R15 | 100 | 105 | 21 | tuf | | tuff with heavy celadonite clay |
| R15 | 105 | 110 | 22 | tuf | | tuff with heavy celadonite clay |
| R15 | 110 | 115 | 23 | tuf | | tuff with 7% rhyolite and heavy celadonite clay |
| R15 | 115 | 120 | 24 | tuf | | tuff with 1% rhyolite |
| R15 | 120 | 125 | 25 | tuf | | tuff with 1% rhyolite and 1% dacite |
| R15 | 125 | 130 | 26 | tuf | | tuff with 1% rhyoite |
| R15 | 130 | 135 | 27 | tuf | | fine grained tuff |
| R15 | 135 | 140 | 28 | tuf | | tuff with 1% rhyolite and heavy clay |
| R15 | 140 | 145 | 29 | tuf | | tuff with 2% rhyolite |
| R15 | 145 | 150 | 30 | tuf | | tuff with 4% rhyolite |
| R15 | 150 | 155 | 31 | tuf | | tuff with 8% rhyolite |
| R15 | 155 | 160 | 32 | tuf | | tuff with 8% rhyolite |
| R15 | 160 | 165 | 33 | bas | | basalt with 3% tuff |
| R15 | 165 | 170 | 34 | bas | | basalt |
| R15 | 170 | 175 | 35 | bas | | basalt |
| R15 | 175 | 180 | 36 | bas | | basalt |
| R15 | 180 | 185 | 37 | bas | | basalt |
| R15 | 185 | 190 | 38 | bas | | basalt |
| R15 | 190 | 195 | 39 | bas | | basalt |
| R15 | 195 | 200 | 40 | bas | | basalt |
| R15 | 200 | 205 | 41 | bas | | basalt |
| R15 | 205 | 210 | 42 | bas | | basalt with light red clay |
| R15 | 210 | 215 | 43 | bas | | basalt with light red clay |
| R15 | 215 | 220 | 44 | bas | | basalt with 1% calcite and light red clay |
| R16 | 0 | 5 | 1 | lahr | | lahar with 15% rhyolite and 5% granitics |
| R16 | 5 | 10 | 2 | lahr | | lahar with 15% rhyolite and 5% granitics |
| R16 | 10 | 15 | 3 | lahr | | lahar with 15% rhyolite and 5% granitics |
| R16 | 15 | 20 | 4 | lahr | | lahar with 30% rhyolite and 5% granitics |
| R16 | 20 | 25 | 5 | lahr | | lahar with 20% rhyolite and 5% granitics |
| R16 | 25 | 30 | 6 | lahr | | lahar with 15% rhyolite and 5% granitics |
| R16 | 30 | 35 | 7 | lahr | | lahar with 15% rhyolite and 5% granitics |
| R16 | 35 | 40 | 8 | lahr | | lahar with 15% rhyolite and 5% granitics and light clay |
| R16 | 40 | 45 | 9 | lahr | | lahar with 40% rhyolite 5% granitics and 1% opal |
| R16 | 45 | 50 | 10 | lahr | | lahar with 30% rhyolite 5% granitics and 1% opal |
| R16 | 50 | 55 | 11 | lahr | | lahar with 20% rhyolite 5% granitics and 1% opal |
| R16 | 55 | 60 | 12 | tuf | | tuff with 1% rhyolite and 1% opal |
| R16 | 60 | 65 | 13 | tuf | | tuff with 1% rhyolite and 1% opal |
| R16 | 65 | 70 | 14 | tuf | | tuff with 5% rhyolite and 1% opal |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R16 | 70 | 75 | 15 | tuf | | tuff with 1% rhyolite and 1% opal |
| R16 | 75 | 80 | 16 | tuf | | tuff |
| R16 | 80 | 85 | 17 | tuf | | tuff |
| R16 | 85 | 90 | 18 | tuf | | tuff with 60% rhyolite |
| R16 | 90 | 95 | 19 | tuf | | tuff with 20% rhyolite |
| R16 | 95 | 100 | 20 | tuf | | tuff with 20% rhyolite |
| R16 | 100 | 105 | 21 | tuf | | tuff with light clay |
| R16 | 105 | 110 | 22 | tuf | | tuff with 1% rhyolite |
| R16 | 110 | 115 | 23 | tuf | | tuff with 1% rhyolite |
| R16 | 115 | 120 | 24 | tuf | | tuff with 1% rhyolite and moderate clay |
| R16 | 120 | 125 | 25 | tuf | | tuff with 1% rhyolite |
| R16 | 125 | 130 | 26 | tuf | | tuff with 1% rhyolite |
| R16 | 130 | 135 | 27 | tuf | | tuff with 5% rhyolite |
| R16 | 135 | 140 | 28 | tuf | | tuff with 5% rhyolite |
| R16 | 140 | 145 | 29 | tuf | | tuff with 10% rhyolite |
| R16 | 145 | 150 | 30 | tuf | | tuff with 40% rhyolite |
| R16 | 150 | 155 | 31 | tuf | | tuff with 20% rhyolite |
| R16 | 155 | 160 | 32 | tuf | | tuff with 5% rhyolite |
| R16 | 160 | 165 | 33 | tuf | | tuff with 5% rhyolite |
| R16 | 165 | 170 | 34 | tuf | | tuff with light clay |
| R16 | 170 | 175 | 35 | tuf | | tuff with light clay |
| R16 | 175 | 180 | 36 | tuf | | tuff with light clay |
| R16 | 180 | 185 | 37 | tuf | | tuff with 5% rhyolite and light clay |
| R16 | 185 | 190 | 38 | tuf | | tuff with 1% rhyolite and heavy clay |
| R16 | 190 | 195 | 39 | tuf | | tuff with 1% rhyolite and heavy clay |
| R16 | 195 | 200 | 40 | tuf | | tuff with 1% rhyolite and heavy clay |
| R16 | 200 | 205 | 41 | tuf | | tuff with light clay |
| R16 | 205 | 210 | 42 | tuf | | tuff with light clay |
| R16 | 210 | 215 | 43 | tuf | | tuff with light clay |
| R16 | 215 | 220 | 44 | tuf | | tuff with light clay |
| R16 | 220 | 225 | 45 | tuf | | tuff |
| R16 | 225 | 230 | 46 | tuf | | tuff with light clay |
| R16 | 230 | 235 | 47 | tuf | | tuff with 3% rhyolite |
| R16 | 235 | 240 | 48 | tuf | | tuff with 5% rhyolite |
| R16 | 240 | 245 | 49 | tuf | | tuff with 1% rhyolite |
| R16 | 245 | 250 | 50 | tuf | | tuff with 1% rhyolite |
| R16 | 250 | 255 | 51 | tuf | | tuff with heavy clay |
| R16 | 255 | 260 | 52 | tuf | | tuff with heavy clay |
| R16 | 260 | 265 | 53 | tuf | | tuff with 30% rhyolite and moderate clay |
| R16 | 265 | 270 | 54 | tuf | | tuff with 5% rhyolite |
| R16 | 270 | 275 | 55 | tuf | | tuff with 1% rhyolite |
| R16 | 275 | 280 | 56 | tuf | | tuff with 1% rhyolite |
| R16 | 280 | 285 | 57 | tuf | | tuff |
| R16 | 285 | 290 | 58 | tuf | | tuff with light clay |
| R16 | 290 | 295 | 59 | tuf | | tuff |
| R16 | 295 | 300 | 60 | tuf | | tuff |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R16 | 300 | 305 | 61 | tuf | | tuff |
| R16 | 305 | 310 | 62 | tuf | | tuff |
| R16 | 310 | 315 | 63 | tuf | | tuff |
| R16 | 315 | 320 | 64 | tuf | | tuff |
| R16 | 320 | 325 | 65 | tuf | | tuff |
| R16 | 325 | 330 | 66 | tuf | | tuff with 5% dacite |
| R16 | 330 | 335 | 67 | tuf | | tuff with 50% dacite |
| R16 | 335 | 340 | 68 | chal | | chalcedony with 5% basalt |
| R16 | 340 | 345 | 69 | bas | | basalt |
| R16 | 345 | 350 | 70 | bas | | basalt |
| R16 | 350 | 355 | 71 | bas | | basalt |
| R16 | 355 | 360 | 72 | bas | | basalt |
| R16 | 360 | 365 | 73 | bas | | basalt |
| R16 | 365 | 370 | 74 | bas | | basalt |
| R16 | 370 | 375 | 75 | bas | | basalt |
| R16 | 375 | 380 | 76 | bas | | basalt |
| R16 | 380 | 385 | 77 | bas | | basalt |
| R16 | 385 | 390 | 78 | bas | | basalt |
| R16 | 390 | 395 | 79 | bas | | basalt |
| R16 | 395 | 400 | 80 | bas | | basalt |
| R16 | 400 | 405 | 81 | bas | | basalt |
| R16 | 405 | 410 | 82 | bas | | basalt |
| R16 | 410 | 415 | 83 | bas | | basalt |
| R16 | 415 | 420 | 84 | bas | | basalt |
| R16 | 420 | 425 | 85 | bas | | basalt |
| R16 | 425 | 430 | 86 | bas | | basalt |
| R16 | 430 | 435 | 87 | bas | | basalt |
| R16 | 435 | 440 | 88 | bas | | basalt |
| R16 | 440 | 445 | 89 | bas | | basalt |
| R16 | 445 | 450 | 90 | bas | | basalt |
| R16 | 450 | 455 | 91 | bas | | basalt |
| R16 | 455 | 460 | 92 | bas | | basalt |
| R16 | 460 | 465 | 93 | bas | | basalt |
| R16 | 465 | 470 | 94 | bas | | basalt |
| R16 | 470 | 475 | 95 | bas | | basalt |
| R16 | 475 | 480 | 96 | bas | | basalt |
| R16 | 480 | 485 | 97 | bas | | basalt |
| R16 | 485 | 490 | 98 | bas | | basalt |
| R16 | 490 | 495 | 99 | bas | | basalt |
| R16 | 495 | 500 | 100 | bas | | basalt |
| R17 | 0 | 5 | 1 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R17 | 5 | 10 | 2 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R17 | 10 | 15 | 3 | tuf | | tuff with 5% rhyolite and 1% chalcedony |
| R17 | 15 | 20 | 4 | tuf | | tuff with 7% rhyolite and 2% chalcedony |
| R17 | 20 | 25 | 5 | tuf | | tuff with 2% chalcedony and 1% rhyolite |
| R17 | 25 | 30 | 6 | tuf | | tuff with 1% opal |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R17 | 30 | 35 | 7 | tuf | | tuff with 1% rhyolite and 1% opal |
| R17 | 35 | 40 | 8 | tuf | | tuff with 2% rhyolite and 1% opal |
| R17 | 40 | 45 | 9 | tuf | | tuff with 5% rhyolite and 1% opal |
| R17 | 45 | 50 | 10 | tuf | | tuff with 15% rhyolite |
| R17 | 50 | 55 | 11 | tuf | | tuff with 15% rhyolite |
| R17 | 55 | 60 | 12 | tuf | | tuff with 3% rhyolite and 1% opal |
| R17 | 60 | 65 | 13 | tuf | | tuff with 5% rhyolite and 1% opal |
| R17 | 65 | 70 | 14 | tuf | | tuff with 4% rhyolite |
| R17 | 70 | 75 | 15 | tuf | | tuff with 4% rhyolite |
| R17 | 75 | 80 | 16 | tuf | | tuff with 15% rhyolite and 1% chalcedony |
| R17 | 80 | 85 | 17 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R17 | 85 | 90 | 18 | tuf | | tuff with 1% rhyolite |
| R17 | 90 | 95 | 19 | tuf | | tuff with 2% rhyolite |
| R17 | 95 | 100 | 20 | tuf | | tuff with 8% rhyolite |
| R17 | 100 | 105 | 21 | tuf | | tuff with 5% rhyolite |
| R17 | 105 | 110 | 22 | tuf | | tuff with 15% rhyolite |
| R17 | 110 | 115 | 23 | tuf | | tuff with 5% rhyolite |
| R17 | 115 | 120 | 24 | tuf | | tuff with 10% rhyolite |
| R17 | 120 | 125 | 25 | tuf | | tuff with 7% rhyolite |
| R17 | 125 | 130 | 26 | tuf | | tuff with 3% rhyolite |
| R17 | 130 | 135 | 27 | tuf | | tuff with 7% rhyolite |
| R17 | 135 | 140 | 28 | tuf | | tuff with 15% rhyolite |
| R17 | 140 | 145 | 29 | tuf | | tuff with 10% rhyolite |
| R17 | 145 | 150 | 30 | tuf | | tuff with 3% rhyolite |
| R17 | 150 | 155 | 31 | tuf | | tuff with 7% rhyolite |
| R17 | 155 | 160 | 32 | tuf | | tuff with 5% rhyolite |
| R17 | 160 | 165 | 33 | tuf | | tuff with 5% rhyolite |
| R17 | 165 | 170 | 34 | tuf | | tuff with 3% rhyolite |
| R17 | 170 | 175 | 35 | tuf | | tuff with 7% rhyolite |
| R17 | 175 | 180 | 36 | tuf | | tuff with 25% rhyolite |
| R17 | 180 | 185 | 37 | tuf | | tuff with 8% rhyolite |
| R17 | 185 | 190 | 38 | tuf | | tuff with 6% rhyolite |
| R17 | 190 | 195 | 39 | tuf | | tuff with 3% rhyolite |
| R17 | 195 | 200 | 40 | tuf | | tuff with 1% rhyolite |
| R17 | 200 | 205 | 41 | tuf | | tuff with 3% rhyolite and 3% chalcedony |
| R17 | 205 | 210 | 42 | tuf | | tuff with 7% rhyolite and 1% chalcedony |
| R17 | 210 | 215 | 43 | tuf | | tuff with 3% dacite 2% rhyolite and 1% chalcedony |
| R17 | 215 | 220 | 44 | tuf | | tuff with 3% rhyolite |
| R17 | 220 | 225 | 45 | tuf | | tuff with 3% rhyolite and 1% chalcedony |
| R17 | 225 | 230 | 46 | tuf | | tuff with 1% rhyolite |
| R17 | 230 | 235 | 47 | tuf | | tuff |
| R17 | 235 | 240 | 48 | tuf | | tuff |
| R17 | 240 | 245 | 49 | tuf | | tuff with 1% rhyolite |
| R17 | 245 | 250 | 50 | tuf | | tuff with 10% basalt |
| R17 | 250 | 255 | 51 | tuf | | tuff with 3% rhyolite |
| R17 | 255 | 260 | 52 | bas | | basalt with 1% calcite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R17 | 260 | 265 | 53 | bas | | basalt with 1% calcite |
| R17 | 265 | 270 | 54 | bas | | basalt with 1% opal |
| R17 | 270 | 275 | 55 | bas | | basalt with 5% opal |
| R17 | 275 | 280 | 56 | bas | | basalt with 1% chalcedony |
| R18 | 0 | 5 | 1 | tuf | | tuff with 3% rhyolite |
| R18 | 5 | 10 | 2 | tuf | | tuff with 3% rhyolite |
| R18 | 10 | 15 | 3 | tuf | | tuff with 15% rhyolite and 1% chalcedony |
| R18 | 15 | 20 | 4 | tuf | | tuff with 3% rhyolite and 2% chalcedony |
| R18 | 20 | 25 | 5 | tuf | | tuff with 5% rhyolite and 1% chalcedony |
| R18 | 25 | 30 | 6 | tuf | | tuff with 3% rhyolite and 3% dacite |
| R18 | 30 | 35 | 7 | tuf | | tuff with 7% rhyolite and 1% chalcedony |
| R18 | 35 | 40 | 8 | tuf | | tuff with 7% rhyolite |
| R18 | 40 | 45 | 9 | tuf | | tuff with 5% dacite 3% rhyolite and minor chalcedony |
| R18 | 45 | 50 | 10 | tuf | | tuff with 5% dacite 3% rhyolite and minor chalcedony |
| R18 | 50 | 55 | 11 | tuf | | tuff with 7% rhyolite and 1% chalcedony |
| R18 | 55 | 60 | 12 | tuf | | tuff with 5% rhyolite and 3% chalcedony |
| R18 | 60 | 65 | 13 | tuf | | tuff with 3% rhyolite and 2% dacite |
| R18 | 65 | 70 | 14 | tuf | | tuff |
| R18 | 70 | 75 | 15 | tuf | | tuff with 10% basalt and 1% dacite |
| R18 | 75 | 80 | 16 | bas | | basalt with 3% tuff |
| R18 | 80 | 85 | 17 | bas | | basalt |
| R18 | 85 | 90 | 18 | bas | | basalt with 1% calcite |
| R18 | 90 | 95 | 19 | bas | | basalt |
| R18 | 95 | 100 | 20 | bas | | basalt with 1% calcite |
| R18 | 100 | 105 | 21 | bas | | basalt with 1% calcite |
| R18 | 105 | 110 | 22 | bas | | basalt with 1% calcite |
| R18 | 110 | 115 | 23 | bas | | basalt with 3% calcite |
| R18 | 115 | 120 | 24 | bas | | basalt |
| R18 | 120 | 125 | 25 | bas | | basalt with 1% calcite |
| R18 | 125 | 130 | 26 | bas | | basalt with 3% calcite |
| R18 | 130 | 135 | 27 | bas | | basalt with 2% calcite |
| R18 | 135 | 140 | 28 | bas | | basalt |
| R19 | 0 | 5 | 1 | tuf | | tuff with 7% rhyolite |
| R19 | 5 | 10 | 2 | tuf | | tuff with 7% rhyolite |
| R19 | 10 | 15 | 3 | tuf | | tuff with 7% rhyolite |
| R19 | 15 | 20 | 4 | tuf | | tuff with 10% rhyolite and 3% chalcedony |
| R19 | 20 | 25 | 5 | tuf | | tuff with 8% rhyolite |
| R19 | 25 | 30 | 6 | tuf | | tuff with 30% rhyolite |
| R19 | 30 | 35 | 7 | tuf | | tuff with 7% rhyolite and minor chalcedony |
| R19 | 35 | 40 | 8 | tuf | | tuff with 5% rhyolite and 1% chalcedony |
| R19 | 40 | 45 | 9 | tuf | | tuff with 5% rhyolite and 1% chalcedony |
| R19 | 45 | 50 | 10 | tuf | | tuff with 7% rhyolite |
| R19 | 50 | 55 | 11 | tuf | | tuff with 7% rhyolite |
| R19 | 55 | 60 | 12 | tuf | | tuff with 9% rhyolite |
| R19 | 60 | 65 | 13 | tuf | | tuff with 8% rhyolite |
| R19 | 65 | 70 | 14 | tuf | | tuff with 8% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R19 | 70 | 75 | 15 | tuf | | tuff with 10% rhyolite and 2% chalcedony |
| R19 | 75 | 80 | 16 | tuf | | tuff with 3% rhyolite |
| R19 | 80 | 85 | 17 | tuf | | tuff with 3% rhyolite |
| R19 | 85 | 90 | 18 | tuf | | tuff with 5% rhyolite |
| R19 | 90 | 95 | 19 | tuf | | tuff with 3% rhyolite |
| R19 | 95 | 100 | 20 | tuf | | tuff with 3% rhyolite and 1% opal |
| R19 | 100 | 105 | 21 | tuf | | tuff |
| R19 | 105 | 110 | 22 | tuf | | tuff |
| R19 | 110 | 115 | 23 | tuf | | tuff with 5% rhyolite |
| R19 | 115 | 120 | 24 | tuf | | tuff with 5% rhyolite |
| R19 | 120 | 125 | 25 | tuf | | tuff |
| R19 | 125 | 130 | 26 | tuf | | tuff |
| R19 | 130 | 135 | 27 | tuf | | tuff |
| R19 | 135 | 140 | 28 | tuf | | tuff |
| R19 | 140 | 145 | 29 | tuf | | tuff |
| R19 | 145 | 150 | 30 | tuf | | tuff |
| R19 | 150 | 155 | 31 | tuf | | tuff with 5% rhyolite |
| R19 | 155 | 160 | 32 | tuf | | tuff |
| R19 | 160 | 165 | 33 | tuf | | tuff |
| R19 | 165 | 170 | 34 | tuf | | tuff with 10% rhyolite |
| R19 | 170 | 175 | 35 | tuf | | tuff |
| R19 | 175 | 180 | 36 | tuf | | tuff |
| R19 | 180 | 185 | 37 | tuf | | tuff |
| R19 | 185 | 190 | 38 | tuf | | tuff |
| R19 | 190 | 195 | 39 | tuf | | tuff with 10% rhyolite |
| R19 | 195 | 200 | 40 | tuf | | tuff with 5% rhyolite |
| R19 | 200 | 205 | 41 | tuf | | tuff with moderate clay |
| R19 | 205 | 210 | 42 | tuf | | tuff with moderate clay |
| R19 | 210 | 215 | 43 | tuf | | tuff with 5% rhyolite |
| R19 | 215 | 220 | 44 | tuf | | tuff with 1% rhyolite |
| R19 | 220 | 225 | 45 | tuf | | tuff with 3% rhyolite |
| R19 | 225 | 230 | 46 | tuf | | tuff |
| R19 | 230 | 235 | 47 | tuf | | tuff |
| R19 | 235 | 240 | 48 | tuf | | tuff |
| R19 | 240 | 245 | 49 | tuf | | tuff |
| R19 | 245 | 250 | 50 | tuf | | tuff |
| R19 | 250 | 255 | 51 | tuf | | tuff with light clay |
| R19 | 255 | 260 | 52 | tuf | | tuff with 2% rhyolite |
| R19 | 260 | 265 | 53 | tuf | | tuff |
| R19 | 265 | 270 | 54 | tuf | | tuff with light clay |
| R19 | 270 | 275 | 55 | tuf | | tuff with light clay |
| R19 | 275 | 280 | 56 | tuf | | tuff |
| R19 | 280 | 285 | 57 | tuf | | tuff with 1% rhyolite and light clay |
| R19 | 285 | 290 | 58 | tuf | | tuff with 1% rhyolite and light clay |
| R19 | 290 | 295 | 59 | tuf | | tuff with 1% rhyolite |
| R19 | 295 | 300 | 60 | tuf | | tuff with 1% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R19 | 300 | 305 | 61 | tuf | | tuff with 1% rhyolite |
| R19 | 305 | 310 | 62 | tuf | | tuff with 5% dacite |
| R19 | 310 | 315 | 63 | tuf | | tuff with 5% dacite |
| R19 | 315 | 320 | 64 | tuf | | tuff with 5% dacite |
| R19 | 320 | 325 | 65 | tuf | | tuff with 5% dacite |
| R19 | 325 | 330 | 66 | tuf | | tuff with 5% dacite |
| R19 | 330 | 335 | 67 | tuf | | tuff with 5% dacite |
| R19 | 335 | 340 | 68 | tuf | | tuff with 5% dacite |
| R19 | 340 | 345 | 69 | tuf | | tuff with 5% dacite |
| R19 | 345 | 350 | 70 | tuf | | tuff with 5% dacite |
| R19 | 350 | 355 | 71 | tuf | | tuff with 5% dacite |
| R19 | 355 | 360 | 72 | tuf | | tuff with 5% dacite |
| R19 | 360 | 365 | 73 | tuf | | tuff with heavy clay |
| R19 | 365 | 370 | 74 | tuf | | tuff with moderate clay |
| R19 | 370 | 375 | 75 | tuf | | tuff with moderate clay |
| R19 | 375 | 380 | 76 | bas | | basalt with 20% chalcedony |
| R19 | 380 | 385 | 77 | bas | | basalt |
| R19 | 385 | 390 | 78 | bas | | basalt |
| R19 | 390 | 395 | 79 | bas | | basalt |
| R19 | 395 | 400 | 80 | bas | | basalt |
| R19 | 400 | 405 | 81 | bas | | basalt |
| R19 | 405 | 410 | 82 | bas | | basalt |
| R19 | 410 | 415 | 83 | bas | | basalt with 1% chalcedony |
| R19 | 415 | 420 | 84 | bas | | basalt |
| R19 | 420 | 425 | 85 | bas | | basalt |
| R19 | 425 | 430 | 86 | bas | | basalt |
| R19 | 430 | 435 | 87 | bas | | basalt |
| R19 | 435 | 440 | 88 | bas | | basalt |
| R19 | 440 | 445 | 89 | bas | | basalt |
| R19 | 445 | 450 | 90 | bas | | basalt |
| R19 | 450 | 455 | 91 | bas | | basalt |
| R19 | 455 | 460 | 92 | bas | | basalt |
| R19 | 460 | 465 | 93 | bas | | basalt |
| R19 | 465 | 470 | 94 | bas | | basalt |
| R19 | 470 | 475 | 95 | bas | | basalt |
| R19 | 475 | 480 | 96 | bas | | basalt |
| R19 | 480 | 485 | 97 | bas | | basalt |
| R19 | 485 | 490 | 98 | bas | | basalt |
| R19 | 490 | 495 | 99 | bas | | basalt |
| R19 | 495 | 500 | 100 | bas | | basalt |
| R19 | 500 | 505 | 101 | bas | | basalt |
| R19 | 505 | 510 | 102 | bas | | basalt |
| R19 | 510 | 515 | 103 | bas | | basalt |
| R19 | 515 | 520 | 104 | bas | | basalt |
| R19 | 520 | 525 | 105 | bas | | basalt |
| R19 | 525 | 530 | 106 | bas | | basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R19 | 530 | 535 | 107 | bas | | basalt |
| R19 | 535 | 540 | 108 | bas | | basalt |
| R19 | 540 | 545 | 109 | bas | | basalt |
| R19 | 545 | 550 | 110 | bas | | basalt |
| R19 | 550 | 555 | 111 | bas | | basalt |
| R19 | 555 | 560 | 112 | bas | | basalt |
| R19 | 560 | 565 | 113 | bas | | basalt |
| R19 | 565 | 570 | 114 | bas | | basalt |
| R19 | 570 | 575 | 115 | bas | | basalt |
| R19 | 575 | 580 | 116 | bas | | basalt |
| R19 | 580 | 585 | 117 | bas | | basalt |
| R19 | 585 | 590 | 118 | bas | | basalt |
| R19 | 590 | 595 | 119 | tuf | | tuff with 50% basalt |
| R19 | 595 | 600 | 120 | tuf | | tuff |
| R19 | 600 | 605 | 121 | tuf | | tuff with 20% dacite |
| R19 | 605 | 610 | 122 | tuf | | tuff with 20% dacite |
| R19 | 610 | 615 | 123 | tuf | | tuff with 20% dacite |
| R19 | 615 | 620 | 124 | tuf | | tuff with 20% dacite |
| R19 | 620 | 625 | 125 | tuf | | tuff with 5% dacite |
| R19 | 625 | 630 | 126 | tuf | | tuff |
| R19 | 630 | 635 | 127 | tuf | | tuff with 5% dacite |
| R19 | 635 | 640 | 128 | tuf | | tuff with 5% dacite |
| R19 | 640 | 645 | 129 | tuf | | tuff with 5% dacite |
| R19 | 645 | 650 | 130 | tuf | | tuff with 3% rhyolite |
| R19 | 650 | 655 | 131 | tuf | | tuff |
| R19 | 655 | 660 | 132 | tuf | | tuff |
| R19 | 660 | 665 | 133 | tuf | | tuff |
| R19 | 665 | 670 | 134 | tuf | | tuff |
| R2 | 0 | 5 | 1 | bas | | Basalt |
| R2 | 5 | 10 | 2 | bas | | Basalt |
| R2 | 10 | 15 | 3 | bas | | Basalt |
| R2 | 15 | 20 | 4 | lahr | | 1st foot basalt then lahar with 40% rhyolite |
| R2 | 20 | 25 | 5 | lahr | | lahar with 30% rhyolite |
| R2 | 25 | 30 | 6 | lahr | | lahar with 60% rhyolite |
| R2 | 30 | 35 | 7 | lahr | | lahar with 20% rhyolite |
| R2 | 35 | 40 | 8 | lahr | | lahar with 20% rhyolite |
| R2 | 40 | 45 | 9 | lahr | | lahar with 30% rhyolite |
| R2 | 45 | 50 | 10 | lahr | | lahar with 40% rhyolite |
| R2 | 50 | 55 | 11 | lahr | | lahar with 40% rhyolite |
| R2 | 55 | 60 | 12 | lahr | | lahar with 40% rhyolite and heavy celadonite clay |
| R2 | 60 | 65 | 13 | tuf | | tuff with 10% rhyolite and heavy clay |
| R2 | 65 | 70 | 14 | tuf | | tuff with 5% rhyolite |
| R2 | 70 | 75 | 15 | tuf | | tuff with 5% rhyolite and moderate clay |
| R2 | 75 | 80 | 16 | tuf | | tuff with 5% rhyolite and 5% chalcedony |
| R2 | 80 | 85 | 17 | tuf | | tuff with 10% quartz 5% rhyolite and 5% chalcedony |
| R2 | 85 | 90 | 18 | tuf | | tuff with 10% quartz 5% rhyolite and 5% chalcedony |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R2 | 90 | 95 | 19 | tuf | | tuff with 10% quartz 5% rhyolite and 5% chalcedony |
| R2 | 95 | 100 | 20 | tuf | | tuff with 5% rhyolite |
| R2 | 100 | 105 | 21 | tuf | | tuff with 10% rhyolite |
| R2 | 105 | 110 | 22 | tuf | | tuff with 5% rhyolite and heavy clinoptilolite |
| R2 | 110 | 115 | 23 | tuf | | tuff with 5% rhyolite and heavy clinoptilolite |
| R2 | 115 | 120 | 24 | tuf | | tuff with 5% rhyolite and heavy clinoptilolite |
| R2 | 120 | 125 | 25 | tuf | | tuff with 5% rhyolite |
| R2 | 125 | 130 | 26 | tuf | | tuff with 5% rhyolite |
| R2 | 130 | 135 | 27 | tuf | | tuff with 5% rhyolite |
| R2 | 135 | 140 | 28 | tuf | | tuff with 5% rhyolite |
| R2 | 140 | 145 | 29 | tuf | | tuff with 1% rhyolite |
| R2 | 145 | 150 | 30 | tuf | | tuff |
| R2 | 150 | 155 | 31 | tuf | | tuff |
| R2 | 155 | 160 | 32 | tuf | | tuff with 5% rhyolite and light clay |
| R2 | 160 | 165 | 33 | tuf | | tuff with less than 1% rhyolite |
| R2 | 165 | 170 | 34 | tuf | | tuff with less than 1% rhyolite |
| R2 | 170 | 175 | 35 | tuf | | tuff with less than 1% rhyolite |
| R2 | 175 | 180 | 36 | tuf | | tuff |
| R2 | 180 | 185 | 37 | tuf | | platey tuff |
| R2 | 185 | 190 | 38 | tuf | | tuff |
| R2 | 190 | 195 | 39 | tuf | | tuff |
| R2 | 195 | 200 | 40 | chal | | dark chalcedony with 20% tuff |
| R2 | 200 | 205 | 41 | tuf | | tuff with 1% rhyolite |
| R2 | 205 | 210 | 42 | tuf | | tuff with 1% rhyolite |
| R2 | 210 | 215 | 43 | tuf | | tuff with 1% rhyolite |
| R2 | 215 | 220 | 44 | tuf | | tuff |
| R2 | 220 | 225 | 45 | tuf | | tuff |
| R2 | 225 | 230 | 46 | tuf | | tuff |
| R2 | 230 | 235 | 47 | tuf | | tuff |
| R2 | 235 | 240 | 48 | tuf | | tuff with 25% rhyolite |
| R2 | 240 | 245 | 49 | tuf | | tuff with 25% rhyolite and light clay |
| R2 | 245 | 250 | 50 | tuf | | tuff |
| R2 | 250 | 255 | 51 | tuf | | tuff |
| R2 | 255 | 260 | 52 | tuf | | tuff with 10% rhyolite |
| R2 | 260 | 265 | 53 | tuf | | tuff with 30% rhyolite |
| R2 | 265 | 270 | 54 | tuf | | tuff with light clay |
| R2 | 270 | 275 | 55 | tuf | | tuff with 1% rhyolite and heavy clay |
| R2 | 275 | 280 | 56 | tuf | | tuff with 1% rhyolite and moderate clay |
| R2 | 280 | 285 | 57 | tuf | | tuff |
| R2 | 285 | 290 | 58 | tuf | | tuff |
| R2 | 290 | 295 | 59 | tuf | | tuff |
| R2 | 295 | 300 | 60 | tuf | | tuff with moderate clay |
| R2 | 300 | 305 | 61 | tuf | | tuff with 5% rhyolite |
| R2 | 305 | 310 | 62 | tuf | | tuff with 5% rhyolite |
| R2 | 310 | 315 | 63 | tuf | | tuff with 2% rhyolite |
| R2 | 315 | 320 | 64 | tuf | | tuff with 1% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R2 | 320 | 325 | 65 | tuf | | tuff |
| R2 | 325 | 330 | 66 | tuf | | tuff |
| R2 | 330 | 335 | 67 | tuf | | tuff |
| R2 | 335 | 340 | 68 | tuf | | tuff |
| R2 | 340 | 345 | 69 | tuf | | tuff |
| R2 | 345 | 350 | 70 | tuf | | tuff |
| R2 | 350 | 355 | 71 | tuf | | tuff |
| R2 | 355 | 360 | 72 | tuf | | tuff |
| R2 | 360 | 365 | 73 | tuf | | tuff with 5% rhyolite and heavy clay |
| R2 | 365 | 370 | 74 | tuf | | tuff with heavy clay |
| R2 | 370 | 375 | 75 | tuf | | tuff |
| R2 | 375 | 380 | 76 | tuf | | tuff |
| R2 | 380 | 385 | 77 | tuf | | tuff |
| R2 | 385 | 390 | 78 | tuf | | tuff |
| R2 | 390 | 395 | 79 | tuf | | tuff |
| R2 | 395 | 400 | 80 | tuf | | tuff |
| R2 | 400 | 405 | 81 | tuf | | light tuff |
| R2 | 405 | 410 | 82 | tuf | | tuff |
| R2 | 410 | 415 | 83 | tuf | | tuff |
| R2 | 415 | 420 | 84 | tuf | | tuff |
| R2 | 420 | 425 | 85 | tuf | | tuff with 50% dacite |
| R2 | 425 | 430 | 86 | tuf | | tuff |
| R2 | 430 | 435 | 87 | tuf | | tuff |
| R2 | 435 | 440 | 88 | tuf | | tuff |
| R2 | 440 | 445 | 89 | tuf | | tuff |
| R2 | 445 | 450 | 90 | tuf | | tuff |
| R2 | 450 | 455 | 91 | tuf | | tuff |
| R2 | 455 | 460 | 92 | tuf | | tuff |
| R2 | 460 | 465 | 93 | tuf | | tuff with 25% rhyolite |
| R2 | 465 | 470 | 94 | tuf | | tuff with 25% rhyolite |
| R2 | 470 | 475 | 95 | tuf | | tuff |
| R2 | 475 | 480 | 96 | tuf | | tuff |
| R2 | 480 | 485 | 97 | tuf | | tuff |
| R2 | 485 | 490 | 98 | tuf | | tuff |
| R2 | 490 | 495 | 99 | tuf | | tuff with 10% dacite |
| R2 | 495 | 500 | 100 | tuf | | tuff with 10% dacite |
| R2 | 500 | 505 | 101 | tuf | | tuff with heavy clinoptilolite |
| R2 | 505 | 510 | 102 | tuf | | tuff with heavy clinoptilolite |
| R2 | 510 | 515 | 103 | tuf | | tuff with heavy clinoptilolite |
| R2 | 515 | 520 | 104 | tuf | | tuff with 5% dacite and heavy clay |
| R2 | 520 | 525 | 105 | tuf | | tuff with 50% dacite |
| R2 | 525 | 530 | 106 | tuf | | tuff with 50% dacite and heavy clay |
| R2 | 530 | 535 | 107 | tuf | | tuff with 50% dacite and heavy clay |
| R2 | 535 | 540 | 108 | tuf | | tuff with 50% dacite and 5% basalt |
| R2 | 540 | 545 | 109 | bas | | basalt |
| R2 | 545 | 550 | 110 | bas | | basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R2 | 550 | 555 | 111 | bas | | basalt |
| R2 | 555 | 560 | 112 | bas | | basalt |
| R2 | 560 | 565 | 113 | bas | | basalt |
| R2 | 565 | 570 | 114 | bas | | basalt |
| R2 | 570 | 575 | 115 | bas | | basalt |
| R2 | 575 | 580 | 116 | bas | | basalt |
| R2 | 580 | 585 | 117 | bas | | basalt |
| R2 | 585 | 590 | 118 | bas | | basalt |
| R2 | 590 | 595 | 119 | bas | | basalt |
| R2 | 595 | 600 | 120 | bas | | basalt |
| R2 | 600 | 605 | 121 | bas | | basalt |
| R2 | 605 | 610 | 122 | bas | | basalt |
| R2 | 610 | 615 | 123 | bas | | basalt |
| R2 | 615 | 620 | 124 | bas | | basalt |
| R2 | 620 | 625 | 125 | bas | | basalt |
| R2 | 625 | 630 | 126 | bas | | basalt |
| R2 | 630 | 635 | 127 | bas | | basalt |
| R2 | 635 | 640 | 128 | bas | | basalt |
| R2 | 640 | 645 | 129 | bas | | basalt |
| R2 | 645 | 650 | 130 | bas | | basalt |
| R2 | 650 | 655 | 131 | bas | | basalt |
| R2 | 655 | 660 | 132 | bas | | basalt |
| R2 | 660 | 665 | 133 | bas | | basalt |
| R2 | 665 | 670 | 134 | bas | | basalt |
| R2 | 670 | 675 | 135 | bas | | basalt |
| R2 | 675 | 680 | 136 | bas | | basalt |
| R2 | 680 | 685 | 137 | bas | | basalt |
| R2 | 685 | 690 | 138 | bas | | basalt |
| R2 | 690 | 695 | 139 | bas | | basalt |
| R2 | 695 | 700 | 140 | bas | | basalt |
| R2 | 700 | 705 | 141 | bas | | basalt |
| R2 | 705 | 710 | 142 | bas | | basalt |
| R2 | 710 | 715 | 143 | bas | | basalt |
| R2 | 715 | 720 | 144 | bas | | basalt |
| R2 | 720 | 725 | 145 | bas | | basalt |
| R2 | 725 | 730 | 146 | bas | | basalt with 1% calcite |
| R2 | 730 | 735 | 147 | bas | | basalt with 1% calcite |
| R2 | 735 | 740 | 148 | bas | | basalt with 1% calcite |
| R2 | 740 | 745 | 149 | bas | | basalt |
| R2 | 745 | 750 | 150 | bas | | basalt |
| R2 | 750 | 755 | 151 | bas | | basalt |
| R2 | 755 | 760 | 152 | bas | | basalt with 1% tuff |
| R2 | 760 | 765 | 153 | tuf | | tuff |
| R2 | 765 | 770 | 154 | tuf | | tuff |
| R2 | 770 | 775 | 155 | tuf | | tuff with 5% basalt |
| R2 | 775 | 780 | 156 | tuf | | tuff with 1 % basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R2 | 780 | 785 | 157 | tuf | | tuff |
| R2 | 785 | 790 | 158 | tuf | | tuff |
| R2 | 790 | 795 | 159 | tuf | | tuff |
| R2 | 795 | 800 | 160 | tuf | | tuff |
| R5 | 0 | 5 | 1 | tuf | | tuff |
| R5 | 5 | 10 | 2 | tuf | | tuff |
| R5 | 10 | 15 | 3 | bas | | basalt |
| R5 | 15 | 20 | 4 | bas | | basalt |
| R5 | 20 | 25 | 5 | bas | | basalt |
| R5 | 25 | 30 | 6 | bas | | basalt |
| R5 | 30 | 35 | 7 | bas | | basalt |
| R5 | 35 | 40 | 8 | bas | | basalt with 2% rhyolite |
| R5 | 40 | 45 | 9 | bas | | basalt |
| R5 | 45 | 50 | 10 | bas | | basalt |
| R5 | 50 | 55 | 11 | bas | | basalt |
| R5 | 55 | 60 | 12 | bas | | basalt |
| R5 | 60 | 65 | 13 | bas | | basalt |
| R5 | 65 | 70 | 14 | bas | | basalt |
| R5 | 70 | 75 | 15 | bas | | basalt with 2% tuff |
| R5 | 75 | 80 | 16 | tuf | | tuff with 20% basalt and 2% rhyolite |
| R5 | 80 | 85 | 17 | tuf | | tuff with 5% rhyolite |
| R5 | 85 | 90 | 18 | tuf | | tuff with 5% rhyolite |
| R5 | 90 | 95 | 19 | tuf | | tuff with 5% rhyolite and 2% basalt |
| R5 | 95 | 100 | 20 | tuf | | tuff with 5% rhyolite and 2% basalt |
| R5 | 100 | 105 | 21 | tuf | | tuff with 10% rhyolite |
| R5 | 105 | 110 | 22 | tuf | | tuff with 10% rhyolite |
| R5 | 110 | 115 | 23 | tuf | | tuff with 10% rhyolite |
| R5 | 115 | 120 | 24 | tuf | | tuff with 10% rhyolite |
| R5 | 120 | 125 | 25 | tuf | | tuff |
| R5 | 125 | 130 | 26 | tuf | | tuff |
| R5 | 130 | 135 | 27 | tuf | | tuff with 2% andesite |
| R5 | 135 | 140 | 28 | tuf | | tuff with 10% andesite |
| R5 | 140 | 145 | 29 | tuf | | tuff with 10% andesite |
| R5 | 145 | 150 | 30 | tuf | | tuff with 3% rhyolite and 1% andesite |
| R5 | 150 | 155 | 31 | tuf | | tuff with 2% andesite |
| R5 | 155 | 160 | 32 | tuf | | tuff with 2% andesite |
| R5 | 160 | 165 | 33 | tuf | | tuff with 2% andesite |
| R5 | 165 | 170 | 34 | tuf | | tuff with 2% andesite |
| R5 | 170 | 175 | 35 | tuf | | tuff with 2% andesite |
| R5 | 175 | 180 | 36 | tuf | | tuff |
| R5 | 180 | 185 | 37 | tuf | | tuff |
| R5 | 185 | 190 | 38 | tuf | | tuff with heavy clay |
| R5 | 190 | 195 | 39 | tuf | | tuff with light clay |
| R5 | 195 | 200 | 40 | tuf | | tuff with light clay |
| R5 | 200 | 205 | 41 | tuf | | tuff with moderate clay |
| R5 | 205 | 210 | 42 | tuf | | tuff |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R5 | 210 | 215 | 43 | tuf | | tuff with heavy clay |
| R5 | 215 | 220 | 44 | tuf | | tuff with light clay |
| R5 | 220 | 225 | 45 | tuf | | tuff with 2% dacite |
| R5 | 225 | 230 | 46 | tuf | | tuff with heavy clay |
| R5 | 230 | 235 | 47 | tuf | | tuff with heavy clay |
| R5 | 235 | 240 | 48 | tuf | | tuff with light clay |
| R5 | 240 | 245 | 49 | tuf | | tuff with heavy clay |
| R5 | 245 | 250 | 50 | tuf | | tuff with heavy clay |
| R5 | 250 | 255 | 51 | tuf | | tuff with heavy clay |
| R5 | 255 | 260 | 52 | tuf | | tuff with heavy clay |
| R5 | 260 | 265 | 53 | tuf | | tuff with heavy clay |
| R5 | 265 | 270 | 54 | tuf | | tuff with moderate clay |
| R5 | 270 | 275 | 55 | tuf | | tuff |
| R5 | 275 | 280 | 56 | tuf | | tuff with moderate clay |
| R5 | 280 | 285 | 57 | tuf | | tuff with heavy clay |
| R5 | 285 | 290 | 58 | tuf | | tuff with heavy clay |
| R5 | 290 | 295 | 59 | tuf | | tuff with heavy clay |
| R5 | 295 | 300 | 60 | tuf | | tuff with heavy clay |
| R6 | 0 | 5 | 1 | tuf | | tuff with 1% rhyolite |
| R6 | 5 | 10 | 2 | tuf | | tuff with 1% rhyolite |
| R6 | 10 | 15 | 3 | tuf | | white tuff |
| R6 | 15 | 20 | 4 | tuf | | white tuff with 5% rhyolite |
| R6 | 20 | 25 | 5 | tuf | | white tuff with 10% rhyolite |
| R6 | 25 | 30 | 6 | tuf | | white tuff with 5% rhyolite |
| R6 | 30 | 35 | 7 | lahr | | lahar with 50% rhyolite |
| R6 | 35 | 40 | 8 | lahr | | lahar with 50% rhyolite |
| R6 | 40 | 45 | 9 | lahr | | lahar with 50% rhyolite 3' tuff bed in middle |
| R6 | 45 | 50 | 10 | lahr | | lahar with 50% rhyolite |
| R6 | 50 | 55 | 11 | lahr | | lahar with 30% rhyolite |
| R6 | 55 | 60 | 12 | lahr | | lahar with 50% rhyolite |
| R6 | 60 | 65 | 13 | lahr | | lahar with 50% rhyolite |
| R6 | 65 | 70 | 14 | lahr | | lahar with 50% rhyolite |
| R6 | 70 | 75 | 15 | lahr | | lahar with 50% rhyolite |
| R6 | 75 | 80 | 16 | lahr | | light lahar with 20% rhyolite and moderate clay |
| R6 | 80 | 85 | 17 | lahr | | light lahar with 10% rhyolite and moderate clay |
| R6 | 85 | 90 | 18 | clay | | heavy white clay |
| R6 | 90 | 95 | 19 | lahr | | light lahar with 20% rhyolite |
| R6 | 95 | 100 | 20 | lahr | | light lahar with 10% rhyolite |
| R6 | 100 | 105 | 21 | lahr | | light lahar with 5% rhyolite and light clay |
| R6 | 105 | 110 | 22 | clay | | green celadonite clay seam |
| R6 | 110 | 115 | 23 | bas | | basalt |
| R6 | 115 | 120 | 24 | bas | | basalt |
| R6 | 120 | 125 | 25 | bas | | basalt |
| R6 | 125 | 130 | 26 | bas | | basalt with 2% celadonite opal |
| R6 | 130 | 135 | 27 | bas | | basalt with 2% celadonite opal and minor iron oxides |
| R6 | 135 | 140 | 28 | bas | | basalt with 2% celadonite opal and minor iron oxides |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R6 | 140 | 145 | 29 | bas | | basalt with 2% celadonite opal and minor iron oxides |
| R6 | 145 | 150 | 30 | bas | | basalt with 2% celadonite opal |
| R6 | 150 | 155 | 31 | bas | | basalt with 2% celadonite opal |
| R6 | 155 | 160 | 32 | bas | | basalt with 2% celadonite opal |
| R6 | 160 | 165 | 33 | bas | | basalt with 2% celadonite opal |
| R6 | 165 | 170 | 34 | bas | | basalt with 2% celadonite opal |
| R6 | 170 | 175 | 35 | bas | | basalt with 2% celadonite opal |
| R6 | 175 | 180 | 36 | bas | | basalt with 2% celadonite opal |
| R6 | 180 | 185 | 37 | lahr | | lahar with 30% rhyolite |
| R6 | 185 | 190 | 38 | tuf | | tuff with 1% rhyolite |
| R6 | 190 | 195 | 39 | tuf | | tuff with 1% rhyolite and moderate clay |
| R6 | 195 | 200 | 40 | tuf | | tuff with 1% rhyolite and heavy clay |
| R6 | 200 | 205 | 41 | tuf | | tuff |
| R6 | 205 | 210 | 42 | tuf | | tuff |
| R6 | 210 | 215 | 43 | tuf | | tuff |
| R6 | 215 | 220 | 44 | tuf | | tuff |
| R6 | 220 | 225 | 45 | tuf | | tuff |
| R6 | 225 | 230 | 46 | tuf | | tuff |
| R6 | 230 | 235 | 47 | tuf | | tuff with 1% chalcedony |
| R6 | 235 | 240 | 48 | tuf | | tuff |
| R6 | 240 | 245 | 49 | tuf | | tuff |
| R6 | 245 | 250 | 50 | tuf | | tuff |
| R6 | 250 | 255 | 51 | tuf | | white tuff |
| R6 | 255 | 260 | 52 | tuf | | tuff |
| R6 | 260 | 265 | 53 | tuf | | tuff |
| R6 | 265 | 270 | 54 | tuf | | tuff |
| R6 | 270 | 275 | 55 | tuf | | tuff |
| R6 | 275 | 280 | 56 | tuf | | tuff |
| R6 | 280 | 285 | 57 | tuf | | tuff |
| R6 | 285 | 290 | 58 | tuf | | tuff |
| R6 | 290 | 295 | 59 | tuf | | tuff |
| R6 | 295 | 300 | 60 | tuf | | tuff |
| R8 | 0 | 5 | 1 | tuf | | tuff with 1% rhyolite |
| R8 | 5 | 10 | 2 | tuf | | tuff with 1% rhyolite |
| R8 | 10 | 15 | 3 | tuf | | tuff with 1% rhyolite |
| R8 | 15 | 20 | 4 | tuf | | tuff with 20% rhyolite |
| R8 | 20 | 25 | 5 | tuf | | tuff with 10% rhyolite |
| R8 | 25 | 30 | 6 | tuf | | tuff with 3% rhyolite |
| R8 | 30 | 35 | 7 | tuf | | tuff with 3% rhyolite |
| R8 | 35 | 40 | 8 | tuf | | tuff with 5% rhyolite |
| R8 | 40 | 45 | 9 | tuf | | tuff with 12% rhyolite |
| R8 | 45 | 50 | 10 | tuf | | tuff with 7% rhyolite |
| R8 | 50 | 55 | 11 | tuf | | tuff with 7% rhyolite |
| R8 | 55 | 60 | 12 | tuf | | tuff with 3% rhyolite |
| R8 | 60 | 65 | 13 | tuf | | tuff with 3% rhyolite |
| R8 | 65 | 70 | 14 | lahr | | lahar with 20% rhyolite |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R8 | 70 | 75 | 15 | lahr | | lahar with 25% rhyolite |
| R8 | 75 | 80 | 16 | lahr | | lahar with 20% rhyolite |
| R8 | 80 | 85 | 17 | tuf | | tuff with 12% rhyolite |
| R8 | 85 | 90 | 18 | tuf | | tuff with 7% rhyolite |
| R8 | 90 | 95 | 19 | tuf | | tuff with 15% rhyolite |
| R8 | 95 | 100 | 20 | tuf | | tuff with 15% rhyolite |
| R8 | 100 | 105 | 21 | tuf | | tuff with 5% rhyolite |
| R8 | 105 | 110 | 22 | tuf | | tuff with 5% rhyolite and heavy clay |
| R8 | 110 | 115 | 23 | tuf | | tuff with 15% rhyolite |
| R8 | 115 | 120 | 24 | tuf | | tuff with 20% rhyolite and light clay |
| R8 | 120 | 125 | 25 | tuf | | tuff with 3% rhyolite and heavy clay |
| R8 | 125 | 130 | 26 | lahr | | lahar with 7% dacite 1% chalcedony and heavy clay |
| R8 | 130 | 135 | 27 | lahr | | lahar with 30% rhyolite 5% dacite and heavy clay |
| R8 | 135 | 140 | 28 | lahr | | lahar with 30% rhyolite 5% dacite and heavy clay |
| R8 | 140 | 145 | 29 | tuf | | tuff with 5% rhyolite and light clay |
| R8 | 145 | 150 | 30 | tuf | | tuff with 5% rhyolite and light clay |
| R8 | 150 | 155 | 31 | tuf | | tuff with 5% rhyolite and light clay |
| R8 | 155 | 160 | 32 | tuf | | tuff with 5% rhyolite and heavy clay |
| R8 | 160 | 165 | 33 | tuf | | tuff with 5% dacite and 3% rhyolite |
| R8 | 165 | 170 | 34 | tuf | | tuff with 6% dacite and 3% rhyolite |
| R8 | 170 | 175 | 35 | bas | | basalt with 7% tuff |
| R8 | 175 | 180 | 36 | bas | | basalt with 7% tuff |
| R8 | 180 | 185 | 37 | bas | | basalt with 2% tuff |
| R8 | 185 | 190 | 38 | bas | | basalt |
| R8 | 190 | 195 | 39 | bas | | basalt |
| R8 | 195 | 200 | 40 | bas | | basalt |
| R8 | 200 | 205 | 41 | bas | | basalt |
| R8 | 205 | 210 | 42 | bas | | basalt |
| R8 | 210 | 215 | 43 | bas | | basalt |
| R8 | 215 | 220 | 44 | bas | | basalt |
| R8 | 220 | 225 | 45 | bas | | basalt |
| R8 | 225 | 230 | 46 | bas | | basalt |
| R8 | 230 | 235 | 47 | bas | | basalt |
| R8 | 235 | 240 | 48 | bas | | basalt |
| R8 | 240 | 245 | 49 | bas | | basalt |
| R8 | 245 | 250 | 50 | bas | | basalt |
| R8 | 250 | 255 | 51 | bas | | basalt |
| R8 | 255 | 260 | 52 | bas | | basalt |
| R8 | 260 | 265 | 53 | bas | | basalt |
| R8 | 265 | 270 | 54 | bas | | basalt |
| R8 | 270 | 275 | 55 | bas | | basalt |
| R8 | 275 | 280 | 56 | bas | | basalt |
| R8 | 280 | 285 | 57 | bas | | basalt |
| R8 | 285 | 290 | 58 | bas | | basalt |
| R8 | 290 | 295 | 59 | bas | | basalt |
| R8 | 295 | 300 | 60 | bas | | basalt |

| hole_id | depth_from | depth_to | samp_id | rock_code | color_code | comments |
|---|---|---|---|---|---|---|
| R8 | 300 | 305 | 61 | bas | | basalt |
| R8 | 305 | 310 | 62 | bas | | basalt |
| R8 | 310 | 315 | 63 | bas | | basalt |
| R8 | 315 | 320 | 64 | bas | | basalt |
| R8 | 320 | 325 | 65 | bas | | basalt |
| R8 | 325 | 330 | 66 | bas | | basalt |
| R8 | 330 | 335 | 67 | bas | | basalt |
| R8 | 335 | 340 | 68 | bas | | basalt |
| R8 | 340 | 345 | 69 | lahr | | lahar with 10% basalt and 7% rhyolite |
| R8 | 345 | 350 | 70 | lahr | | lahar with minor rhyolite and dacite |

Appendix G.2

# Gem Hill Supplemental Including Paleontological Resources for the Proposed Gem Hill Portland Cement Project

# McKenna et al.

History/Archaeology/Architectural History/Ethnography/Paleontology

Jeanette A. McKenna, MA, HonDL
Reg. Professional Archaeologist
Owner and Principal Investigator

May 28, 2020

LILBURN CORPORATION
Attn: Frank Amendola
1905 Business Center Drive
San Bernardino, California 92408

RE: Gem Hill Supplemental.

Mr. Amendola:

In response to your request, McKenna et al. arranged for the preparation of a paleontological overview for the CalPortland Gem Hill property in Rosamond, Kern County, California. Attached is the summary prepared by the Natural History Museum of Los Angeles County (McLeod 2020). In summarizing the data provided, the project area consists primarily of volcanic igneous rocks associated with the Gem Hill Formation. These deposits are not fossil bearing.

However, on the western boundary of the project area, there are exposed Fiss Fanglomerate associated with the middle-to-late Miocene. These deposits have been known to yield fossil specimens. Extensive excavations into the Fiss Fanglomerate may expose the fine-grained deposits sensitive for fossil specimens.

The National Geologic Map Database (attached), citing Dibblee 1967) notes the Rosamond Hills can be divided into five local units, including the Gem Hills formation, "… Group is nonfossiliferous except for diatoms in limestone in upper part …". Dibblee (1967) was a modest supplement to Dibblee (1958), "Tertiary Stratigraphic Units of West Mojave Desert, Califonria." Dibble (1958:138-140) states:

> "Associated with the Gen Hill formation in the Rosamond and Bissell areas are rhyolitic rocks that are mostly volcanic intrusive although some are extrusive masses. These rocks are mapped separately as the Bobtail quartz latite member … The Gem Hill formation of Miocene(?) age, the lower unit of the Tropico group in the Rosamond district, is her named from Gem Hill in the Rosamond Hills, 5 ½ miles northwest of Rosamond. This formation

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(562) 696-3852 (CA Office) (480) 664-0682 (AZ Office) Cell 562-754-7712
Email = jeanette.mckennaetal@gmail.com

> is exposed nearly continuously from Gem Hill southeastward 7 miles to Red Hill, 2 miles northeast of Rosamond. Other exposures occur at various placed in the Elizabeth Lake Quadrangle or Willow Springs and Rosamond quadrangles, namely, Antelope Buttes and Little Buttes southwest of Rosamond, Middle Buttes, Soledad Mountain, and the ridge north of Bissell.
>
> "The Gem Hill formation consists mainly of stratified light-colored rhyolite lithic tuff, tuff-breccia, tuffaceous sandstone, volcanic agglomerate, and some conglomerates of both volcanic and granitic clasts. At or near the top at several places are one or more thin basalt flows. At Gem Hill the thickness of this formation is 1,250 feet … It rests on quartz monzonite, and is overlain by the Fiss fanglomerate, with a gradational contact at Gem Hill, but with a sharp, locally unconformable contact elsewhere.
>
> "The Gem Hill formation is non-fossiliferous so that its position in the Tertiary is uncertain. However, it is tentatively correlated on the basis of its lithologic similarity and stratigraphic position with the Miocene Kinnick formation of Buwalda and Lewis (1955, pp. 147-148) in the Tehachapi area."

Based on the summary provided by McLeod (2020) and the documents of Dibblee (1958 and 1967), the Gem Hill project area is not considered sensitive for paleontological specimens (fossils). However, significant excavations, primarily on the western boundary of the property, may impact deposits consistent with finer-grained sedimentary deposits that have been known to yield fossil specimens. Should these deposits be encountered, McLeod recommends paleontological monitoring and a program designed to sample sediments, identify and recover fossil specimens, analysis, reporting, and curation of the find(s), in compliance with professional and local policies and guidelines.

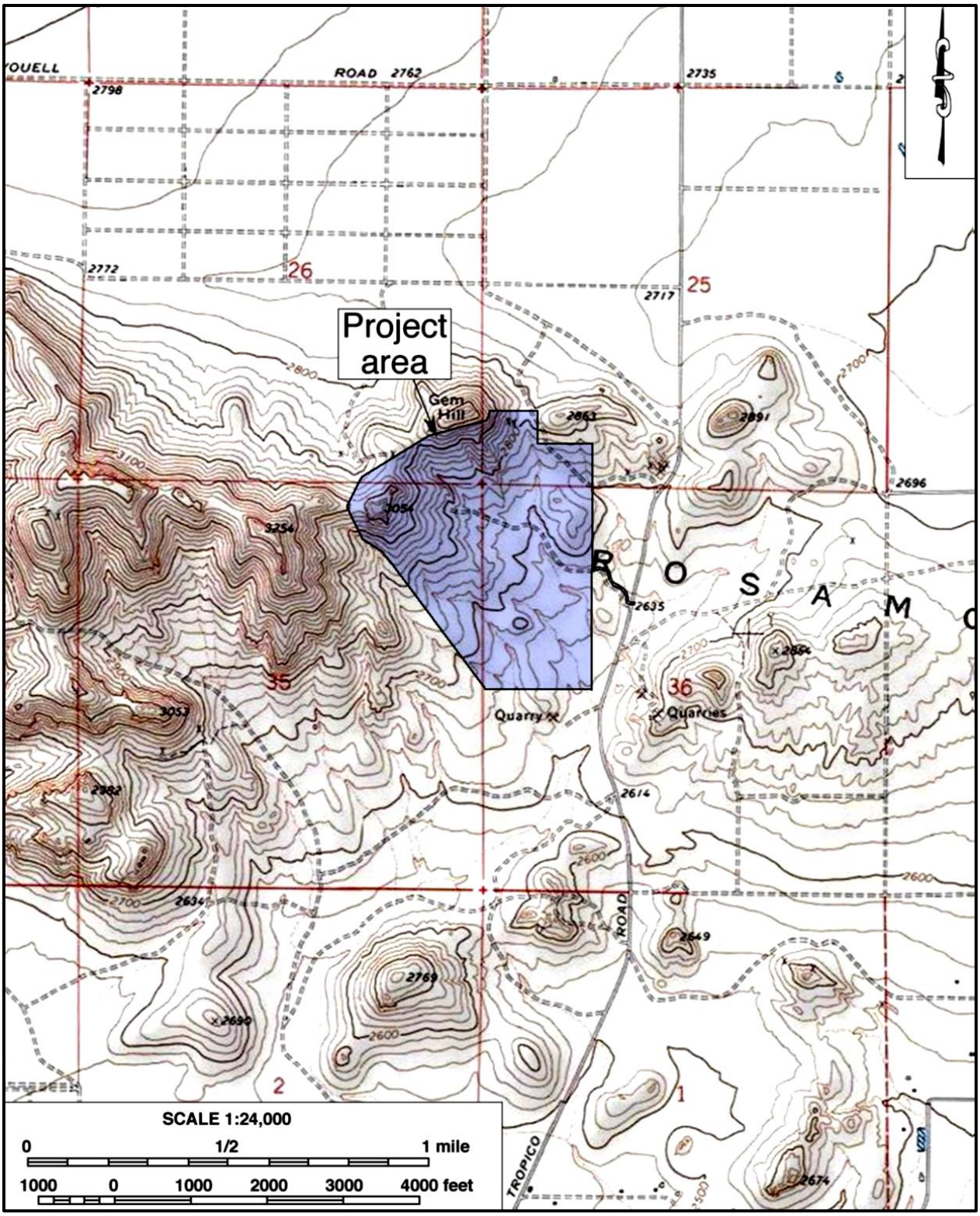
At this time, McKenna et al. is not recommending a paleontological monitoring program, but recommends the project proponent have a paleontological consultant on-call to address any issues that may arise. In addition, McKenna et al. is recommending preparation of a Paleontological Resource Impact Mitigation Program (PRIMP) prior to any excavations, pending the need to implement a minoring program on short notice. Please review the attached documents and feel free to contact our offices if you have any questions or concerns pertaining to this review.

Sincerely,

*Jeanette A. McKenna*

Jeanette A. McKenna, Principal

6008 Friends Avenue, Whittier, California 90601-3724 or 1941 E. Pegasus Drive, Tempe, Arizona 85283
(562) 696-3852 (CA Office) (480) 664-0682 (AZ Office) Cell 562-754-7712
Email = jeanette.mckennaetal@gmail.com


Project area
Gem Hill
ROAD 2762
2798
2772
26
25
2717
2735
2696
2635
2691
2863
3254
3054
2800
2700
3100
35
36
Quarry
Quarries
2884
3052
2982
2614
2600
2634
2649
2769
2690
2674
ROAD
TROPICO
2
1
SCALE 1:24,000
0
1/2
1 mile
1000
0
1000
2000
3000
4000 feet

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

28 May 2020

McKenna et al.
6008 Friends Avenue
Whittier, California 90601-3724

Attn: Jeanette A. McKenna

re: Paleontological resources for the proposed Gem Hill Portland Cement Project, McKenna et al. Job No. 20.2089, in the Rosamond Hills, San Bernardino County, project area

Dear Jeanette:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Gem Hill Portland Cement Project, McKenna et al. Job No. 20.2089, in the Rosamond Hills, San Bernardino County, project area as outlined on the portion of the Soledad Mountain USGS topographic quadrangle map that you sent to me on 14 May 2020. We do not have any vertebrate fossil localities that lie directly within the proposed project area boundaries, but we do have localities farther afield from sedimentary deposits similar to those that may occur subsurface in the proposed project area.

Almost all of the proposed project area has bedrock composed of volcanic igneous rocks of the Gem Hill Formation. These igneous rocks will not contain recognizable fossils. In the far western portion of the proposed project area there are exposures of the middle to late Miocene Fiss Fanglomerate. We do not have any vertebrate fossil localities from the Fiss Fanglomerate, and as a coarse alluvial fan deposit it typically would not contain significant vertebrate fossils. Finer grained pockets within the Fiss Fanglomerate though may well contain significant fossil vertebrate remains. In the slight drainages in the southeastern portion of the proposed project area there are surface deposits of younger Quaternary Alluvium, derived from the igneous bedrock upslope. Typically these types of deposits do not contain significant vertebrate fossils in

the uppermost layers, and in the proposed project area they are probably both thin and relatively coarse. Our closest vertebrate fossil locality from somewhat similar deposits is LACM 7891, west-northwest of the proposed project area near the Los Angeles Aqueduct west of Oak Creek, that produced a fossil specimen of camel, *Hemiauchenia*.

Excavations in the igneous bedrock exposed in almost all of the proposed project area will not uncover any recognizable fossils. Excavations in the Fiss Fanglomerate exposed in the far western portion of the proposed project area are unlikely to uncover significant vertebrate fossils. Shallow excavations in the younger Quaternary Alluvium exposed in the drainages in the southeastern portion of the proposed project area probably will not encounter any significant vertebrate fossils. Excavations in the finer-grained deposits of the Fiss Fanglomerate or the younger Quaternary Alluvium at depth, however, may well uncover significant vertebrate fossil remains. Any substantial excavations in finer-grained sedimentary deposits, if present in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

# National Geologic Map Database

## Geolex — Significant Publications

## Geologic Unit: Tropico

Search archives

### Publication:

Dibblee, T.W., Jr., 1958, Tertiary stratigraphic units of western Mojave desert, California: American Association of Petroleum Geologists Bulletin, v. 42, no. 1, p. 135-144. [Available online, with subscription, from AAPG archives: http://www.aapg.org/datasystems or http://search.datapages.com]

### Summary:

Named after Mojave-Tropico road that traverses type section which is designated as exposures in Rosamond Hills within 0.5 mi west of Mojave-Tropico road 1 to 2 mi north of Tropico mines, NE/4 sec.2 T9N R13W, Rosamond 15' quad, Kern Co, CA. Formerly called Rosamond series by Hershey (1902). Divided into units recognizable only in local areas: (1) Gem Hill formation (Miocene?) and Fiss fanglomerate (Miocene?) at Antelope Buttes, (2) Gem Hill formation (Miocene?) (and Bobtail quartz latite member (Miocene?)) and Fiss fanglomerate at Rosamond Hills, (3) Gem Hill formation (Miocene?) (and Bobtail quartz latite member (Miocene?) and Bissell formation (Miocene or Pliocene) in hills north of Bissell, (4) unnamed lower part, Saddleback basalt (Pliocene?) and unnamed upper part in Kramer borate area, (5) unnamed lower part, Red Buttes quartz basalt (Pliocene?), and unnamed upper part in Kramer Hills. [all new]. In general lower part is tuffaceous strata of rhyolitic composition and upper part is coarse stream-laid or fine lacustrine sedimentary rocks and mafic lava flows. Maximum thickness is 2800 ft. Overlies eroded surface of granitic basement rocks. Unconformably underlies Quaternary alluvium. Group is nonfossiliferous except for diatoms in limestone in upper part, 2 mi west of Castle Butte which suggest early Pliocene(?) age. Stratigraphic evidence suggests lower part may be as old as middle or possibly early Miocene(?) age.

*Source: GNU records (USGS DDS-6; Menlo GNULEX).*




**Usage in publication:**
Tropico group*
**Modifications:**
Named
**Dominant lithology:**
Fanglomerate
Basalt
Quartz latite
Tuff
Limestone
**AAPG geologic province:**
Mojave basin

### Publication:

Dibblee, T.W., Jr., 1967, Areal geology of the western Mojave Desert, California: U.S. Geological Survey Professional Paper, 522, 153 p., (incl. geologic map, scale 1:125,000)

### Summary:

Age of group is Oligocene(?) and Miocene. Seven measured sections of unnamed lower part of Tropico Group included. Age of lower unnamed part shown as Oligocene(?) and Miocene(?); age of upper unnamed part shown as Miocene on geologic sketch map of Kramer borate district.

*Source: GNU records (USGS DDS-6; Menlo GNULEX).*




**Usage in publication:**
Tropico Group*
**Modifications:**
Age modified
**AAPG geologic province:**

BULLETIN OF THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS
VOL. 42, NO. 1 (JANUARY, 1958), PP. 135-144, 2 FIGS.

# TERTIARY STRATIGRAPHIC UNITS OF WESTERN MOJAVE DESERT, CALIFORNIA[1]

T. W. DIBBLEE, JR.[2]
Claremont, California

## ABSTRACT

Scattered throughout the western Mojave Desert, mostly in the vicinities of Rosamond, Mojave, and Boron, are exposures of non-marine sedimentary and volcanic rocks of Tertiary age. These rocks rest on a deeply eroded surface of pre-Tertiary granitic and metamorphic rocks that form the crystalline basement complex of this region, and are overlain unconformably by alluvial sediments of Quaternary age. Where exposed the Tertiary rocks are moderately deformed and much eroded.

With the exception of exposures in the foothills northwest of Mojave, the rocks of Tertiary age are mapped as a group, named the Tropico group, with a maximum exposed thickness of about 2,800 feet. This group is divided into several lithologic units of local extent. In most sections the lower unit is a pyroclastic formation, with associated rhyolitic intrusions and flow-breccias, and the upper unit is either fanglomerate or a sequence of carbonate rocks, clays, and sandstones of lacustrine and fluviatile origin. Several basalt flows occur locally in the group, mostly in the middle part. The group is non-fossiliferous except at one locality, where diatom remains in the upper unit suggest early Pliocene age. The lower unit is tentatively correlated with lithologically similar formations of known Miocene age in areas west and northwest. Formations in the Tropico group that are locally distinct are named the Gem Hill formation, Fiss fanglomerate, Bissell formation, Saddleback basalt, and Red Buttes quartz basalt.

In the foothills northwest of Mojave the granitic basement is overlain by about 1,000 feet of terrestrial sandstones and clays named the Horned Toad formation. This formation yielded a mammalian fauna indicating middle or early Pliocene age, and is either younger than or correlative with the upper part of the Tropico group.

## INTRODUCTION

The sequence of non-marine sedimentary, pyroclastic, and volcanic rocks of Tertiary age, exposed in the vicinities of Rosamond and Boron in the western Mojave Desert, has recently been mapped as a group that is locally differentiated into several formational units. In the Rosamond Hills north and northwest of Rosamond this sequence was first described and named the Rosamond series by Hershey (1902, pp. 365–72), and later mapped and described as the Rosamond formation by Simpson (1934, pp. 395–401). Since Hershey's description, the name Rosamond has been applied by later workers to Tertiary stratified rocks exposed in widely separated areas in the Mojave Desert, as far north as Ricardo and as far east as Newberry. Many of these exposed sections called Rosamond were found to be of different ages, with one as old as Paleocene and another as young as Pliocene.

Because of the indiscriminate application of the name Rosamond to so many incongruous assemblages of Tertiary strata in the Mojave Desert, the U. S. Geological Survey does not recognize the application of this name to a stratigraphic unit (Wilmarth, 1938, pp. 3 and 1843). For this reason, the sequence of non-marine sedimentary, pyroclastic, and volcanic rocks exposed in the Rosamond Hills and originally described as the Rosamond series by Hershey (1902,

[1] Manuscript received, July 12, 1957. Publication authorized by the director of the United States Geological Survey.

[2] United States Geological Survey.

pp. 365–72), together with similar and probable correlative rocks of Tertiary age exposed in the vicinities of the Kramer borate area and in the Kramer Hills, are mapped as a major unit. This unit is here named the Tropico group, and is differentiated locally into several formational units where feasible.

### Tropico Group

The Tropico group of Miocene(?) and Pliocene age is here named after the Mojave-Tropico road that traverses the type section, and is a sequence of nonmarine sedimentary, pyroclastic, and volcanic rocks of Tertiary age exposed in the vicinities of Rosamond, Mojave, Castle Butte, Kramer borate area, and Kramer Hills. All the rocks of Tertiary age exposed in the part of the western Mojave Desert included in Figure 1 and southeast of the Garlock fault, with the exception of those exposed in the Horned Toad Hills, are included in the Tropico group. This group is not certainly recognizable elsewhere. Among these exposures of the Tropico group the most complete sections are those at Antelope Buttes, Rosamond Hills, hills north of Bissell, at and near Castle Butte, and in the Kramer Hills. Incomplete sections are exposed at Soledad Mountain and vicinity, and in the Kramer borate district. The type section is designated as that exposed in the Rosamond Hills within $\frac{1}{2}$ mile west of the Mojave-Tropico road 1–2 miles north of the Tropico mines, Rosamond Quadrangle, in the NE. $\frac{1}{4}$ of Sec. 2, T. 9 N., R. 13 W., San Bernardino Base and Meridian.

The Tropico group lies on the deeply eroded surface of granitic basement rocks, mostly quartz monzonite, of pre-Tertiary (Mesozoic?) age, and is unconformably overlain by alluvial sediments of Quaternary age. The group is moderately deformed and the maximum exposed thickness is about 2,800 feet. Abrupt lateral changes of facies are prevalent so that correlation of isolated exposures is difficult if not impossible. In general, however, the lower part is composed mainly of tuffaceous strata of rhyolitic composition, and the upper part is made up of either coarse stream-laid or fine lacustrine sediments or both. Mafic lava flows are commonly present in some sections, mostly in the middle part of the group. Rhyolitic rocks in the form of volcanic intrusive masses or extrusive flow-breccias of limited extent are associated with the tuffaceous strata of the lower part of the group in some places. The Tropico group is non-fossiliferous, except for diatom remains in a limestone in the upper part, 2 miles west of Castle Butte, which suggest early Pliocene age. However, stratigraphic evidence suggests that the lower part of the Tropico group may be as old as middle or possibly early Miocene.

The Tropico group is divided into units recognizable only in local areas. These units are given in the following sequences of the Tropico group exposed in the local areas and shown on Figure 1. Thicknesses given are the maximum exposed. The aggregate totals for the group exposed in any area are not necessarily sum totals of units, because the maximum thickness of all the units does not necessarily occur in one section exposed in any area. The stratigraphic se-

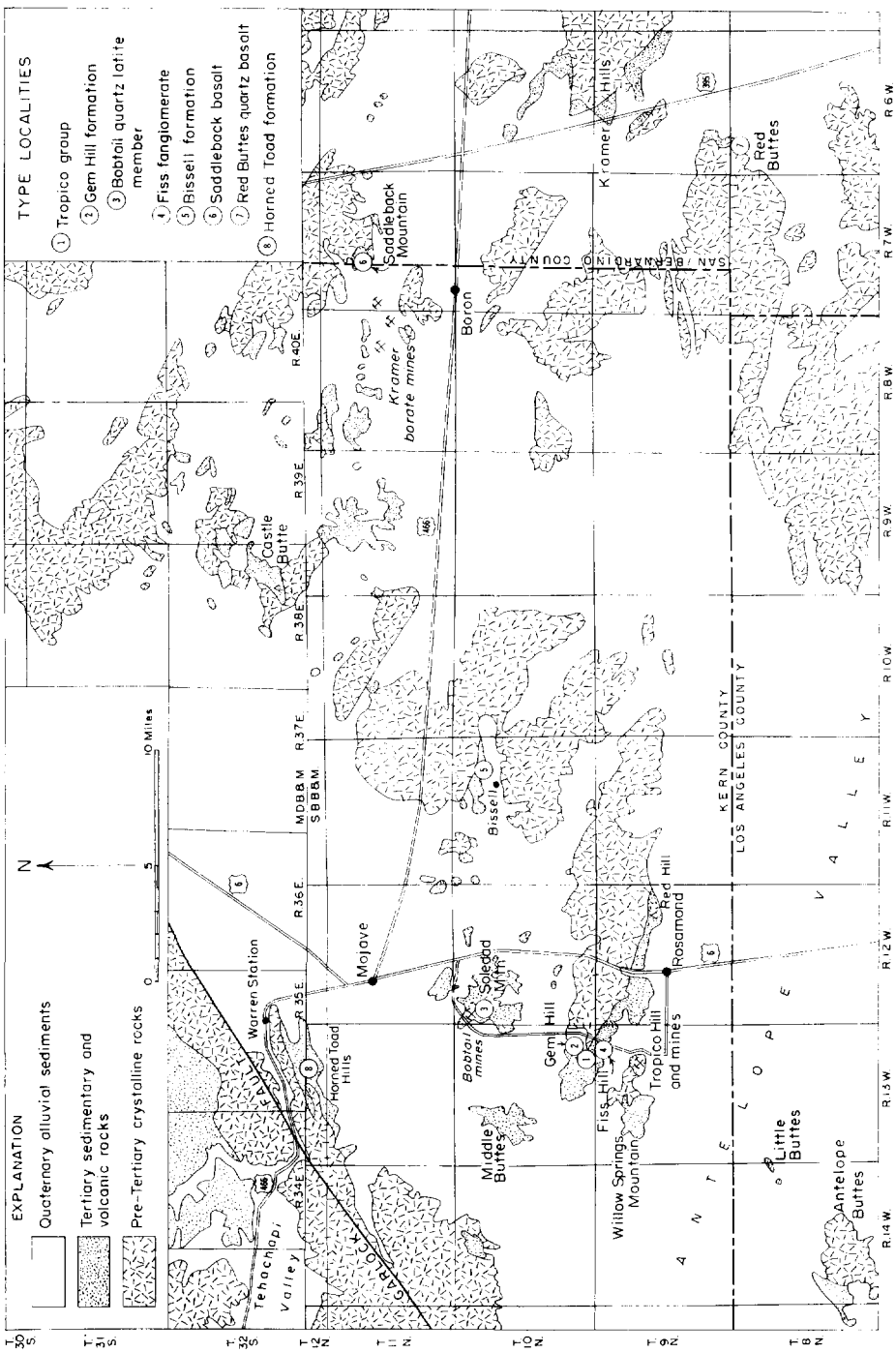



FIG. 1.—Generalized geologic map of part of western Mojave Desert, California, showing type localities of rock units of Tertiary age.

quences of these local units of the Tropico group and their possible correlations are shown graphically in Figure 2.

TROPICO GROUP IN ROSAMOND HILLS (INCLUDING TYPE SECTION), AND AT ANTELOPE BUTTES, ROSAMOND AND WILLOW SPRINGS QUADRANGLES

| | *Feet* |
|---|---|
| Fiss fanglomerate | |
| Fanglomerate and conglomerate of volcanic and some granitic detritus | 1,700 |
| Gem Hill formation | |
| Tuff, tuff-breccia, tuffaceous sandstone, some conglomerate; local thin basic lava flows at or near top | 1,250 |
| Aggregate total | 2,800* |

TROPICO GROUP IN HILLS NORTH OF BISSELL, ROSAMOND QUADRANGLE

| | |
|---|---|
| Bissell formation | |
| Arkosic sandstone, granitic conglomerate, and green-gray siltstone | 450 |
| Clay shale, some thin, soft, white magnesite layers near base | 150 |
| Interbedded limestone, dolomite, chert, siliceous shale, and clay shale | 200 |
| Gem Hill formation | |
| White tuff, some granitic conglomerate at base | 150 |
| Aggregate total | 950 |

* Not sum total because all units do not attain maximum thickness in any single exposed sequence.

Associated with the Gem Hill formation in the Rosamond and Bissell areas are rhyolitic rocks that are mostly volcanic intrusive although some are extrusives masses. These rocks are mapped separately as the Bobtail quartz latite member.

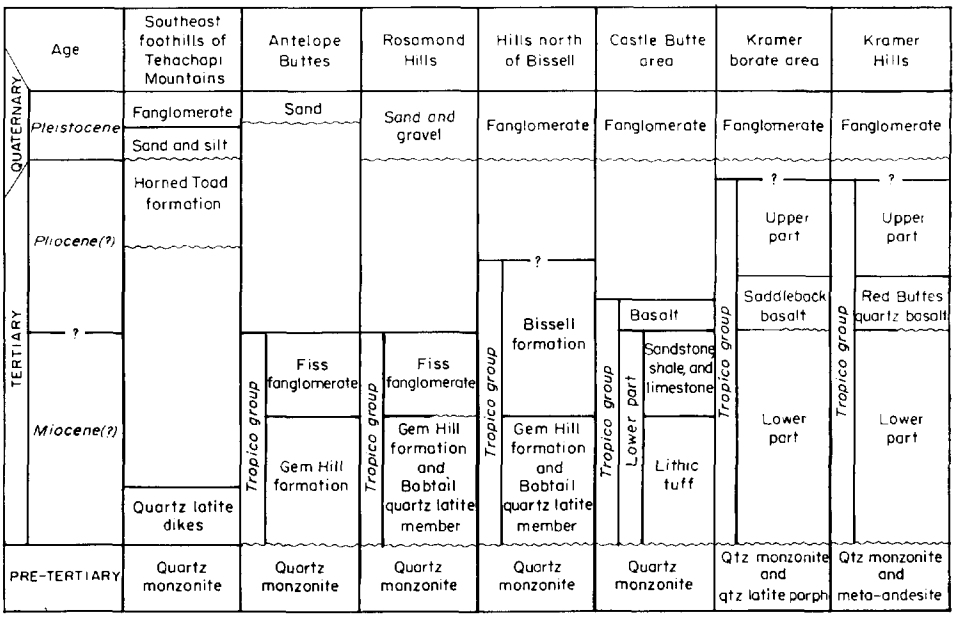



FIG. 2.—Sequences of rocks of Cenozoic age in western Mojave Desert area. Only relative stratigraphic positions and not precise correlations intended. Unconformities indicated by wavy lines.

TROPICO GROUP AT CASTLE BUTTE, CASTLE BUTTE QUADRANGLE

| | *Feet* |
|---|---|
| Tropico group | |
| Basalt | 50 |
| Arkosic sandstone | 200 |
| Clay shale | 260 |
| Limestone, chert, and siliceous shale | 50 |
| Lithic tuff | 885 |
| Aggregate total | 1,445 |

TROPICO GROUP IN KRAMER BORATE DISTRICT, BORON AND CASTLE BUTTE QUADRANGLES

| | |
|---|---|
| Upper part | |
| Granitic conglomerate | 300 |
| Arkosic sandstone | 200 |
| Clay shale, containing borates | 250 |
| Saddleback basalt | |
| One or more basalt flows | 600 |
| *(Local Unconformity)* | |
| Lower part (Equivalent to beds of Tropico group exposed at Castle Butte) | |
| Lithic tuff, tuffaceous shale, some arkosic sandstone, and granitic conglomerate | 1,500 |
| Aggregate total | 2,800* |

* Not sum total because all units do not attain maximum thickness in any exposed sequence.

In his description of the Kramer borate district, Gale (1946, p. 335) referred the Saddleback basalt and the beds above to the Ricardo formation, and the beds below to the Rosamond formation of Simpson (1934) because of the unconformity at the base of the Saddleback basalt. However, there is no faunal evidence to verify this conclusion. The lower part of the Tropico group in the Kramer borate district is tentatively correlated with all the beds exposed below the basalt at Castle Butte, as the basalt at the top of the section at Castle Butte may be equivalent to the Saddleback basalt.

TROPICO GROUP OF KRAMER HILLS, KRAMER QUADRANGLE AND BARSTOW (30-MINUTE) QUADRANGLE

| | *Feet* |
|---|---|
| Upper part | |
| Arkosic sandstone and clay shale, local granitic conglomerate | 800 |
| Red Buttes quartz basalt | |
| Flows of quartz-bearing black basalt | 270 |
| *(Local Unconformity)* | |
| Lower part | |
| Arkosic sandstone, clay shale, limestone, dolomite, chert, and flows of basalt | 1,400 |
| Rhyolitic tuff, arkosic sandstone and conglomerate | 630 |
| Aggregate total | 2,600* |

* Not sum total because all units do not attain maximum thickness in any exposed sequence.

The eastern exposures of this group were described by Bowen (1954, pp. 77, 78) as the Kramer Hills lakebeds, and the upper part of the Tropico group is shown on a sketch map (Bowen, 1954, p. 78) as upper lakebeds, and the lower part as lower lakebeds. However, these are not all of lacustrine origin as they contain a large proportion of stream-laid sandstone and some conglomerate.

### GEM HILL FORMATION

The Gem Hill formation of Miocene(?) age, the lower unit of the Tropico group in the Rosamond district, is here named from Gem Hill in the Rosamond Hills, $5\frac{1}{2}$ miles northwest of Rosamond. This formation is exposed nearly continuously from Gem Hill southeastward 7 miles to Red Hill, 2 miles northeast of Rosamond. Other exposures occur at various places in the Elizabeth Lake Quadrangle or Willow Springs and Rosamond quadrangles, namely, Antelope Buttes and Little Buttes southwest of Rosamond, Middle Buttes, Soledad Mountain, and the ridge north of Bissell.

The Gem Hill formation consists mainly of stratified light-colored rhyolitic lithic tuff, tuff-breccia, tuffaceous sandstone, volcanic agglomerate, and some conglomerates of both volcanic and granitic clasts. At or near the top at several places are one or more thin basalt flows. At Gem Hill the thickness of this formation is 1,250 feet; and at Antelope Buttes, about 1,200 feet; it is thinner elsewhere. It rests on quartz monzonite, and is overlain by the Fiss fanglomerate, with a gradational contact at Gem Hill, but with a sharp, locally unconformable contact elsewhere.

The Gem Hill formation is non-fossiliferous so that its position in the Tertiary is uncertain. However, it is tentatively correlated on the basis of its lithologic similarity and stratigraphic position with the Miocene Kinnick formation of Buwalda and Lewis (1955, pp. 147–48) in the Tehachapi area.

*Type locality.*—Gem Hill, in S. $\frac{1}{2}$, Sec. 25, SE. $\frac{1}{4}$, Sec. 26, and NE. $\frac{1}{4}$, Sec. 35, T. 10 N., R. 13 W., San Bernardino Base and Meridian, $5\frac{1}{2}$ miles northwest of Rosamond, Rosamond Quadrangle.

### BOBTAIL QUARTZ LATITE MEMBER

The rhyolitic volcanic rock extensively exposed on Soledad Mountain and vicinity, near Mojave, is here named the Bobtail quartz latite member of the Gem Hill formation, after the Bobtail mines on the west slope of Soledad Mountain as shown in the Rosamond Quadrangle. At Soledad Mountain and vicinity it makes up several large volcanic plugs, a number of small plugs, pods, and dikes intrusive through pre-Tertiary granitic rocks and into the Gem Hill formation. It also occurs as several short lentils of flow breccia in this formation. Other scattered buttes within 10 miles of Soledad Mountain are remnants of volcanic plugs made up of the Bobtail quartz latite. Among these are several small buttes on the east and north; Middle Buttes 5 miles west; Willow Springs Mountain and Tropico Hill about 7 miles southwest; and several small intrusive masses in the Rosamond Hills.

The Bobtail quartz latite member is a felsitic to porphyritic rock that is predominantly cream white in color, but in places is tan, pink, brown, or pale green. The porphyritic facies contains scattered phenocrysts that make up as much as 25 per cent of the rock mass and are composed of quartz, plagioclase (oligoclase) and orthoclase (sanadine). The felsitic facies and groundmass of the porphyritic

facies are dense massive to faintly flow-laminated, and composed of the same minerals as the phenocrysts, plus small amounts of hematite. In addition to these facies there are chilled marginal zones of gray perlite in some places.

The age of most if not all the Bobtail quartz latite member must be the same as that of the Gem Hill formation, which it intrudes and in which it occurs as extrusive masses, or probably middle Miocene. It is older than the Fiss fanglomerate, which it does not intrude, and the fanglomerate is made up largely of detritus derived from it and contains several small landslide masses of it near the base.

*Type locality.*—Soledad Mountain, Rosamond Quadrangle, Secs. 6 and 7, T. 10 N., R. 12 W., San Bernardino Base and Meridian.

### FISS FANGLOMERATE

The Fiss fanglomerate of Miocene(?) age, the upper unit of the Tropico group in the vicinity of Rosamond, is here named after Fiss Hill, in the Rosamond Hills a mile south of Gem Hill. It crops out discontinuously about 8 miles along the southwestern margin of the Rosamond Hills from the west end 6 miles northwest of Rosamond to Red Hill 2 miles northeast of that town. The only other exposure of this fanglomerate is at Antelope Buttes, 12 miles southwest of Rosamond.

The Fiss fanglomerate is crudely bedded and is composed of ill-sorted cobbles and boulders of pinkish brown rhyolitic volcanic rocks and some of granitic rocks. The exposed thickness at the type section is about 500 feet, and a mile northwest, about 900 feet. At Antelope Buttes it is about 1,700 feet. It rests on the Gem Hill formation, in places unconformably; the top is eroded, and north of Rosamond the fanglomerate is overlain unconformably by gravel of probable Pleistocene age.

The Fiss fanglomerate is non-fossiliferous but is probably correlative with similar fanglomerate mapped and described by Wiese (1950, pp. 33–35, Pl. 1) as Miocene(?) continental deposits in west Antelope Valley, and which in part grade laterally westward into marine sediments with upper Miocene molluscan fossils. It may be correlative with the late Miocene Bopesta formation of Buwalda and Lewis (1955, p. 148) in the Tehachapi area.

*Type locality.*—Fiss Hill, a low hill in west-central part of Sec. 1, T. 9 N., R. 13 W., San Bernardino Base and Meridian, 1½ miles north-northeast of Tropico Mine, 4½ miles northwest of Rosamond, Rosamond Quadrangle.

### BISSELL FORMATION

The Bissell formation of Miocene or Pliocene age is here named after the Bissell Hills, between Soledad Mountain and Boron. This unit is about 845 feet in thickness and the sequence is as given under the Tropico group. The Bissell formation, which crops out about 3 miles along an east-trending ridge, lies with apparent conformity on tuff of the Gem Hill formation and is overlain unconform-

ably by fanglomerate of probable Pleistocene age. The Bissell formation is non-fossiliferous so that its position within the Tertiary is uncertain. It may be in part a lacustrine facies of the Fiss fanglomerate.

*Type locality.*—An east-trending ridge in N. ½, Sec. 11, T. 10 N., R. 11 W., in the Bissell Hills, in the Rosamond Quadrangle.

### SADDLEBACK BASALT

The Saddleback basalt of Pliocene(?) age was named by Gale (1946, p. 335) as the basal part of the Ricardo formation. The Saddleback basalt is here redefined as a local formation in the Tropico group in the Kramer borate district. Saddleback Mountain is designated as the type locality, in the S. ½ of Sec. 9, T. 11 N., R. 7 W., San Bernardino Base and Meridian, 4 miles north of Boron, Boron Quadrangle. From this feature the Saddleback basalt crops out as scattered exposures in low isolated hills toward the northwest for 6 miles, and west about 10 miles. The exposures in the vicinity of the Kramer borate mines were mapped by Gale (1946).

The Saddleback basalt, as described in detail by Gale (1946, pp. 346–50) is a black dense to fine diabasic-textured rock whose groundmass is composed essentially of plagioclase (calcic labradorite), augite, and olivine. in which are scattered small phenocrysts of calcic labradorite. It consists of several flows that total about 200 feet in thickness at most exposures, including the type section, but in some places it is as much as 600 feet. At the type section it rests on quartz monzonite, but elsewhere it rests with a probable slight unconformity on the lower part of the Tropico group. In the Kramer borate district these underlying rocks were referred to as the Rosamond formation by Gale (1946, pp. 335, 350–57, Pl. 51). The Saddleback basalt is overlain conformably by the borate-bearing shale of the upper part of the Tropico group in the Kramer borate district in the borate mines, and unconformably by fanglomerate of probable Pleistocene age at the surface. The age of the basalt within the Tertiary is in doubt, but if it is correlative with the Ricardo formation as inferred by Gale (1946, p. 335), it would be of early Pliocene age.

### RED BUTTES QUARTZ BASALT

The Red Buttes quartz basalt of Pliocene(?) age is here defined as a local formation within the Tropico group in the Kramer Hills area. It is named after Red Buttes, the type locality, in Sec. 5, T. 8 N., R. 6 W., Kramer Quadrangle, and is prominently exposed north and northeast about 7 miles in the Kramer Hills, Kramer Quadrangle and (30-minute) Barstow Quadrangle.

The Red Buttes quartz basalt is the same as the black quartz andesite described and mapped by Bowen (1954, pp. 78, 83–84, Pl. 1) in the eastern Kramer Hills. The rock is black basalt or mafic andesite and according to Bowen (1954, pp. 8–84) has a dense groundmass of plagioclase and augite-diopside with some hypersthene, hornblende, and magnetite, and contains scattered small

phenocrysts of quartz and labradorite. It consists of several flows totaling about 360 feet in maximum thickness. At Red Buttes it rests on pre-Tertiary quartz monzonite, and is overlain unconformably by fanglomerate of probable Pleistocene age. However, in the Kramer Hills the Red Buttes quartz basalt overlies, probably unconformably, the lower part of the Tropico group and is overlain conformably by the upper part. The age of the Red Buttes quartz basalt is unknown, although Bowen (1954, pp. 77, 81) regards it as Miocene. The probable unconformity at its base and its apparently similar stratigraphic position suggest that it may be correlative with the Saddleback basalt of supposed Pliocene(?) age, of the Kramer borate district.

### HORNED TOAD FORMATION

The Horned Toad formation of early or middle Pliocene age is a sequence of stream-laid and lacustrine sediments here named after the Horned Toad Hills which are about 4 miles northwest of Mojave, Mojave (15-minute) Quadrangle. It crops out in these low southeast foothills of the Tehachapi Mountains from Warren Station southwestward about 3 miles. The formation, which is moderately deformed, overlies quartz monzonite of pre-Tertiary age and intrusive quartz latite of Tertiary age. It is overlain unconformably by light reddish sand, siltstone, and fanglomerate of probable Pleistocene age that is also deformed. The Horned Toad formation is composed of the following members.

| | *Feet* |
|---|---|
| Upper member | |
| Gray gypsiferous clay | 80 |
| Middle member | |
| Indurated green muddy sandstone and several layers of white caliche | 75 |
| Lower member | |
| Gray-white arkosic sands and interbedded light reddish sandy siltstone; basal granitic conglomerate | 900 |
| | 1,055 |

The Horned Toad formation has yielded mammalian fossils indicating early or middle Pliocene age. It may be correlative in part with the Ricardo formation (Merriam, 1914, pp. 275–81, and Dibblee, 1952, pp. 25–30, Pl. 1) exposed in Redrock Canyon. It is either younger than, or possibly equivalent to, the upper part of the Tropico group in the Kramer borate district and in the Kramer Hills.

*Type locality.*—Horned Toad Hills, 4 miles northwest of Mojave, 15-minute Mojave Quadrangle; 30-minute Mojave Quadrangle (E. ½ of Sec. 33, T. 32 S., R. 33 E., Mount Diablo Base and Meridian, NE. ¼ of Sec. 35 and NW. ¼ of Sec. 36, T. 12 N., R. 13 W., San Bernardino Base and Meridian).

### REFERENCES

BOWEN, O. E., JR., 1954, "Geology and Mineral Deposits of Barstow Quadrangle, San Bernardino County, California," *California Div. Mines Bull. 165*, pp. 7–185; 9 pls.

BUWALDA, J. P., AND LEWIS, G. E., 1955, "A New Species of *Merychippus*," *U. S. Geol. Survey Prof. Paper 264-G*, pp. 147–52.

DIBBLEE, T. W., JR., 1952, "Geology of the Saltdale Quadrangle, Kern County, California," *California Div. Mines Bull. 160*, pp. 7–43.

GALE, H. S., 1946, "Geology of the Kramer Borate District, Kern County, California," *California Jour. Mines and Geol.*, Vol. 42, No. 4, pp. 325–78.

HERSHEY, O. H., 1902, "Some Tertiary Formations of Southern California," *Amer. Geologist*, Vol. 29, pp. 349–72.

MERRIAM, J. C., 1914, "The Occurrence of Tertiary Mammalian Remains in Northeastern Nevada," *Bull. California Univ. Dept. Geol. Sci.*, Vol. 8, pp. 275–81.

SIMPSON, E. C., 1934, "Geology and Mineral Deposits of the Elizabeth Lake Quadrangle, California," *California Jour. Mines and Geol.*, Vol. 30, No. 3, pp. 371–415, Pl. 5.

WIESE, J. H., 1950, "Geology and Mineral Resources of the Neenach Quadrangle, California," *California Div. Mines Bull. 153.* 53 pp.

WILMARTH, M. G., 1938, "Lexicon of Geologic Names of the United States," *U. S. Geol. Survey Bull. 896.* 2396 pp.

Appendix H

# Phase I Environmental Site Assessment

# Phase I Environmental Site Assessment
# 6459 Mojave-Tropico Rd
# Mojave, CA 93501

Prepared for
CalPortland

February 1, 2021
Revised December 6, 2021

Project Number 156212

Brown AND Caldwell
450 B Street, Suite 1500
San Diego, California 92101

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# List of Abbreviations

| | |
|---|---|
| AAI Rule | 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries; Final Rule |
| AOC | area of concern |
| APCD | Eastern Kern Air Pollution Control District |
| ASTM | American Society for Testing and Materials |
| ASTM E 1527-13 | ASTM Standard Practice E 1527-13 |
| AUL | Activity and Use Limitation |
| BC | Brown and Caldwell |
| CalPortland | CalPortland Company |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CERS | CalEPA Regulated Site |
| CFR | Code of Federal Regulations |
| CIWQS | California Integrated Water Quality System |
| COC | Chemical of Concern |
| CREC | Controlled Recognized Environmental Condition |
| EDR | Environmental Data Resources, Inc. |
| DEUR | Declaration of Environmental Use Restriction |
| EP | Environmental Professional |
| ESA | Environmental Site Assessment |
| FEMA | Federal Emergency Management Agency |
| FOIA | Freedom of Information Act |
| HREC | Historically Recognized Environmental Condition |
| msd | minimum search distance |
| NPDES | National Pollutant Discharge Elimination System |
| MRDS | Mineral Resource Data System |
| MSDS | Material Data Safety Sheets |
| PCB | Polychlorinated Biphenyls |
| REC | Recognized Environmental Condition |
| Site | Approximate 778-acre parcel located southwest of Mojave, California |
| SWPPP | Stormwater Pollution Prevention Plan |
| TP | Target Property |
| U.S.C. | United States Code |
| VEC | vapor encroachment condition |
| VEMUR | Voluntary Environmental Mitigation Use Restriction |
| VES | vapor encroachment screening |



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# Executive Summary

CalPortland Company (CalPortland) retained Brown and Caldwell (BC) to perform a Phase I Environmental Site Assessment (ESA) for a property located at The Site is located in the western Antelope Valley, approximately five miles northwest of Rosamond and ten miles southwest of Mojave on the west end of the Rosamond Hills in southeastern Kern County in Sections 25, 26, 35 and 36, Township 10 North (T10N), Range 13 West (R13W), San Bernardino Base and Meridian (SBB&M) (Site). The Site consists of an approximately 778 acres of undeveloped land located at the southwest of Mojave, California, as depicted on Figure 1 - Site Location Map. This Phase I ESA is intended to serve as an appropriate, commercially prudent, and reasonable inquiry regarding the potential for recognized environmental conditions (RECs) in connection with the Site.

## Property Description

The Site is currently owned by CalPortland and is located in an area generally undeveloped in Kern County, California. See Figure 1 for a Site Location Map. The Site is approximately 778.14 acres in size and generally rectangular in shape. See Figures 1 and 2 for Site Location and Site Maps, respectively. The geographic coordinates in the general center of the Site are latitude 34˚ 55' 18.40'' North and longitude 118˚ 13' 36.84'' West.

## Physical Setting

The local terrain is variable across the Site, with high topographic relief with the presence of mountains and gently sloping on the alluvial fan deposits on the northern and far southwestern portions of the Site. No wells were identified in the Environmental Data Resources, Inc. (EDR) report within one-mile of the Site. Therefore, depth to groundwater information cannot be determined. Since groundwater typically follows the general regional topographic gradient of an area, it is assumed to generally flow in an east-northeasterly direction.

## Site Reconnaissance

BC conducted an escorted Site reconnaissance on January 22, 2021. The Site is undeveloped. An access road connects the main entrance off of Mojave-Tropico Road to two graded pads. Various undeveloped roads exist across the Site from nearby residents operating vehicles on the property. No structures or fences are located at the Site. No surface stains or stressed vegetation were observed during the Site visit. No ponds are present on the Site and there is no visible evidence of fill material being emplaced at the Site. Based on Site topography, stormwater likely flows in a northerly, easterly, and southerly direction. However, local variations in the ground surface may impact the flow direction of surface stormwater. Hazardous materials, petroleum products, or waste storage areas were not observed. The excavation activities associated with borrow pits or exploration activities on the adjacent property to the south is a potential off-Site environmental concern due to the possible use and spills of hazardous substances during borrow pit operations.

## Records Review

BC conducted a review of standard environmental (regulatory) records and specified historical records for the Site. Based on the results of the historical records review, the Site appears

undeveloped. A review of the historic topographic maps and aerial photographs provided by EDR indicated grading activities on the Site and excavation on adjacent properties.

The Site was identified in four of the databases searched by EDR: National Pollutant Discharge Elimination System (NPDES), California Integrated Water Quality System Project (CIWQS), CalEPA Regulated Site (CERS), and Mines Mineral Resource Data System (MRDS). These listing correlate to construction activities by CalPortland. The NPDES and CIWQS listings have a termination data of November 2019. BC has reviewed these listings and does not find them to be a REC. BC performed a Tier 1 Vapor Encroachment Screening (VES) for the Site in accordance with American Society for Testing and Materials (ASTM) Standard Guide E2600-15. According to the EDR VES Report, no facilities were identified by EDR within the area of concern (AOC) for the Site.

## Interviews

BC conducted interviews of regulatory agency staff and persons knowledgeable about the Site and submitted Freedom of Information Act (FOIA) requests to various regulatory agencies about the current and past uses of the Site during this Phase I ESA. The interviews with agency personnel and owners/occupants of the Site did not identify indications of RECs from current or past operations at the Site.

## Findings, Opinions, and Conclusions

Based on the results of this Phase I ESA, BC provides the following conclusions with regard to the Site.

This Phase I ESA has revealed no evidence of RECs in connection with the Site.

This Phase I ESA has revealed no evidence of controlled RECs (CRECs) in connection with the Site.

This Phase I ESA has identified no evidence of historical RECs (HRECs) in connection with the Site.

This Phase I ESA has revealed no de minimis conditions in connection with the Site.

This Phase I ESA has identified no environmental concerns in connection with the Site.



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Section 1

# Introduction

## 1.1 Purpose

CalPortland Company (CalPortland) retained Brown and Caldwell (BC) to perform a Phase I Environmental Site Assessment (ESA) for a property located at 6459 Mojave-Tropico Rd, Mojave, California 93501 (Site). The Site consists of approximately 778 acres of undeveloped land located at the southwest of Mojave, California, as identified on Figure 1 - Site Location Map. This Phase I ESA is intended to serve as an appropriate, commercially prudent, and reasonable inquiry regarding the potential for recognized environmental conditions (RECs) in connection with the Site. This Phase I ESA report is intended to satisfy "all appropriate inquiry" into the previous ownership and uses of the Site as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at Title 42 of the United States Code (U.S.C.) § 9601(35)(B) and in accordance with 40 Code of Federal Regulations (CFR) Part 312, Standards and Practices for All Appropriate Inquiries; Final Rule (AAI Rule).

## 1.2 Scope of Services

Based on the requirements presented in the American Society for Testing and Materials (ASTM) Standard Practice E1527-13 (ASTM E1527-13), BC performed the following tasks as part of this Phase I ESA. At CalPortland's request, the scope of services included the following considerations to provide them with a baseline evaluation of the environmental conditions at the Site.

- **Task 1 – Records Review.** Obtain and review records that identify potential RECs, historical RECs (HRECs), controlled RECs (CRECs), or de minimis conditions in connection with the Site. The minimum search distance (msd) used for standard and additional environmental record sources was per ASTM E 1527-13. The records review also includes a review of the Site's deed of record to identify environmental liens that may have been recorded for the Site.
- **Task 2 – Site Reconnaissance.** Conduct a Site visit to determine the potential that a REC is present at the Site. Also, observe neighboring properties, to the degree possible, for land uses or other aspects that indicate potential RECs that could adversely affect the Site.
- **Task 3– Tier 1 Vapor Encroachment Screening.** Conduct a Tier 1 Vapor Encroachment Screening (VES) to determine if a vapor encroachment condition (VEC) exists at the Site in accordance with ASTM E2600-15, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*.
- **Task 4 – Interviews.** Interview individuals with knowledge of the Site to obtain information regarding the potential for RECs, HRECs, CRECs or de minimis conditions.
- **Task 5 – Evaluation and Report Preparation.** BC prepared this report detailing the findings associated with each of the above-listed tasks.

The detailed scope of BC's services for this project is included as Appendix A.

## 1.3 Limiting Conditions

This Phase I ESA report has been prepared for the exclusive use of CalPortland and their assigns, in accordance with the standards of the environmental consulting industry at the time the services were performed and in general accordance with the proposal dated January 15, 2021 between BC and CalPortland This work has been performed for the sole purpose of assisting CalPortland in the evaluation of RECs associated with the Site. This Phase I ESA report is governed by the specific scope of work authorized by CalPortland and is not intended to be relied upon by any other party. The findings presented herein are based upon observations of Site conditions as of the date the assessment was performed and a review of reasonably ascertainable standard records sources. The findings and conclusions presented herein should not be assumed to apply to conditions or operating practices on this property occurring subsequent to BC's actual Site visit.

The findings of the Phase I ESA, as represented within this Report, must be viewed in recognition of certain limiting conditions. The scope of work commissioned for this project does not represent an exhaustive study, but rather a reasonable inquiry, consistent with good commercial practice, in accordance with ASTM E1527-13. In the course of this assessment, BC relied on information provided by outside parties, such as the tenants, regulatory agencies, and other interview sources. BC made no independent investigation as to the validity, completeness, or accuracy of such information provided by third-party sources. For the purposes of this assessment, such third-party information is assumed to be accurate unless contradictory evidence is noted, and BC does not express or imply any warranty regarding information provided by third-party sources. This Phase I ESA report makes no representation that environmental contamination does not exist at this Site beyond that described in this report.

In the following paragraphs italicized terms refer to specific definitions set forth in Section 3.2 of ASTM E 1527-13. Some of the specific definitions relating to Phase I ESAs are included in Appendix B. The purpose of this Phase I ESA is to identify, to the extent feasible, pursuant to the scope and limitation of the guidelines set forth in the ASTM E 1527-13, *RECs, HRECs, CRECs* or *de minimis conditions* in connection with the Site.

The term *REC* is defined by ASTM E 1527-13 as:

> The presence or likely presence of any *hazardous substances* or *petroleum products* in, on, or at the *property*: (1) due to release to the environment; (2) under conditions indicative of a *release* to the *environment*; or (3) under conditions that pose a *material threat* of a future *release* to the *environment*. *De minimis conditions* are not *recognized environmental conditions*.

The term *HREC* is defined by ASTM E 1527-13 as:

> A past *release* of any *hazardous substances* or *petroleum products* that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restriction, activity and use limitations, institutional control, or engineering controls). Before calling the past *release* a *historical recognized environmental condition*, the *environmental professional* (EP) must determine whether the past *release* is a *recognized environmental condition* at the time the *Phase I Environmental Site Assessment* is conducted (for example, if there has been a change in the regulatory criteria). If the EP considers the past *release*, to be a *recognized environmental condition* at the time the Phase I ESA is conducted, the



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condition shall be included in the conclusions section of the report as a *recognized environmental condition.*

The term *CREC* is defined by ASTM E 1527-13 as:

> A *recognized environmental condition* resulting from a past *release of hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with *hazardous substance* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, *property* use restrictions, *activity and use limitations, institutional controls,* or *engineering controls*). A condition considered by the *environmental professional* to be a *controlled recognized environmental condition* shall be listed in the findings section of the *Phase I Environmental Site Assessment* report, and as a *recognized environmental condition* in the conclusions section of the *Phase I Environmental Site Assessment report.*

The term *de minimis condition* is defined by ASTM E 1527-13 as:

> A condition that generally does not present a threat to human health or the *environment* and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis conditions* are not *recognized environmental conditions* or *controlled recognized environmental conditions.*

The term *reasonably ascertainable* is defined by ASTM E 1527-13 as:

> Information that is *publicly available* to anyone upon request, obtainable from its source within reasonable time and cost constraints, and *practically reviewable*.

The term *practically reviewable* is defined by ASTM E 1527-13 as:

> Information is provided by the source in a manner and in a form that, upon examination, yields information relevant to the *property* without the need for extraordinary analysis of irrelevant data. The form of the information shall be such that the user can review the records for a limited geographic area. Records that cannot be feasibly retrieved by reference to the location of the property or a geographic area in which the property is located are not generally *practically reviewable*.
>
> *Reasonable time and cost* means that the information will be provided by the source within 20 calendar days of receiving a written, telephone, or in-person request at no more than a nominal cost intended to cover the source's cost of retrieving and duplicating the information.

Additional definitions relating to Phase I ESAs are included in Appendix B.

## 1.4 Exceptions or Deviations from Standard

Exceptions or deviations for this assessment include the following:

- BC was unable to view the entirety of the Site during the Site visit due to the size of the property and lack of access roads to all portions of the Site. Aerial photographs and Google Earth were utilized to attempt to fill in gaps.



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Section 2

# User Provided Information

The 'user' is the party seeking to use ASTM E 1527-13 to complete an ESA of the Site. The user has specific obligations for completing a successful application of ASTM E 1527-13.

BC requested a completed ASTM User Questionnaire from CalPortland. A copy of the ASTM User Questionnaire completed by CalPortland is included in Appendix C. The following summarizes the information provided to BC regarding the Site.

## 2.1 Reason for Performing Phase I ESA

CalPortland has informed BC that the specific reason for this Phase I ESA was to evaluate and establish baseline environmental conditions at the Site following the property transaction. This Phase I ESA is, therefore, intended to serve as an appropriate, commercially prudent, and reasonable inquiry regarding the potential for RECs in connection with the Site. This report will provide CalPortland with "all appropriate inquiry" into the previous ownership and uses of the Site defined under the CERCLA at Title 42 of the U.S.C. § 9601(35)(B), as clarified by 40 CFR 312.

## 2.2 Commonly Known or Reasonably Ascertainable Information

CalPortland reported not to be aware of any commonly known or reasonably ascertainable information about the Site.

## 2.3 Property Value Comparison to Purchase Price

CalPortland reported the purchase price to reasonably reflect the fair market value.

## 2.4 Specialized Knowledge

In the User Questionnaire, the Client indicated that they had no specialized knowledge regarding environmental conditions at the Site.

## 2.5 Title Records

The Client did not provide the title records for the Site. Brown and Caldwell was contracted to conduct a search for current environmental liens, if any, at the Site. No environmental liens were listed. A 50-year Chain-of-Title Report was not requested by the Client. The information regarding the title records is further discussed in Section 4.1.1.

## 2.6 Environmental Liens or Activity and Use Limitations

As identified in the completed User Questionnaire, CalPortland is not aware of any environmental liens or activity and use limitations (AULs) at the Site. An Environmental Lien Search by Environmental Data Resources, Inc. (EDR) revealed no evidence of an environmental lien associated with the Site. The Environmental Lien Search is included in Appendix D.

## 2.7 Owner, Property Manager or Occupant Information

The contact name and other information for the Site, provided by CalPortland, is as follows:

- Desirea Haggard, P.E.
  Director of Environmental Affairs
  (626) 691-1966



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Section 3

# Site Physical Setting Overview

## 3.1 Location

The Site is located in an area generally undeveloped in Kern County, California. See Figure 1 for a Site Location Map.

**Site Address:** The Site is located in the western Antelope Valley, approximately five miles northwest of Rosamond and ten miles southwest of Mojave on the west end of the Rosamond Hills in southeastern Kern County in Sections 25, 26, 35 and 36, Township 10 North (T10N), Range 13 West (R13W), San Bernardino Base and Meridian (SBB&M)

**Legal Description:** The legal description for the Site is included in the Environmental Lien Search located in Appendix D. The Site consists of four assessor's parcel numbers: 345-031-02, 345-032-05, 345-032-31, and 345-294-17.

**Property Uses in Surrounding Area:** The Site is located in an area of generally undeveloped land with some areas of residential use in Kern County, California.

**Zoning:** According to the Kern County Planning and Natural Resources Department, the Site is currently zoned A– Exclusive Agriculture.

## 3.2 Current Ownership/Use of Site and Adjoining Properties

### 3.2.1 Current Site Uses

The Site is currently undeveloped land.

### 3.2.2 Current Adjoining Property Uses

For the purpose of this Phase I ESA, the term adjoining property, as defined by the ASTM E 1527-13, refers to properties that border or are contiguous or partially contiguous to the Site, or properties that would be if a street, road, or other public thoroughfare did not separate them.

Adjoining properties were visually observed from public access rights-of-way to make a cursory assessment for the current land use and its potential for RECs that may have an impact on the Site. Reconnaissance of adjoining properties was performed by review of vicinity records, information provided on Google Earth Maps, viewing land use from legal boundaries, or by walking upon the adjoining properties that were legally accessible. Uses of the adjoining properties to the Site are listed in Table 3-1.

**Table 3-1. Uses of Adjoining Properties**

| | |
|---|---|
| North | Vacant |
| East | Mojave-Tropico Road, Vacant |
| South | Vacant |
| West | Vacant |

# 3.3 Physical Characteristics

## 3.3.1 Physical Features and Topography

**Approximate Size of Site (acres):** The Site is approximately 778 acres in size.

**Approximate Shape of Site:** This Site is generally rectangular in shape. See Figure 2 for a general Site Map.

**Site Topography:** The topography of the Site is generally level. The EDR report indicates that geographic coordinates in the general Site area are latitude 34˚ 55' 18.40'' North and longitude 118˚ 13' 36.84'' West.

**Regional Surface Topography and Manmade Features**: BC reviewed available United States Geological Survey (USGS) 7.5-minute topographic quadrangle maps for the Site and vicinity to determine the physical setting of the Site. The 2012 Soledad Mountain and Willow Springs 7.5-minute USGS topographic quadrangle maps indicate the Site is located in mountainous terrain. Topographic maps indicate that the general direction of regional surface slope appears to be southernly. Refer to Figure 1, Site Location Map.

**Approximate Site Elevation**: According to the EDR report in Appendix E, the Site is approximately 2,944 feet above mean sea level.

**Surface Drainage on the Site**: Based on Site topography, stormwater likely flows in a northernly, easterly, and southernly direction, following various natural topographic drainages. However, local variations in the ground surface may impact the flow direction of surface stormwater. Due to the lack of impermeable cover (i.e., asphalt or concrete) at the Site, a large portion of the stormwater likely infiltrates into the subsurface.

**Drainage Improvements to the Site**: No drainage improvements were observed on Site.

**Drainage from Adjacent Sites**: Based on topography, it is unlikely that stormwater runoff from adjacent properties will flow onto the Site.

**Flood Zones**: According to the EDR Radius Map Report, the Federal Emergency Management Agency (FEMA) Flood Plain Panel is 06029C3675E. According to the Overview Map and Detail Map in the EDR Radius Map Report, the Site is not located in a 100- or 500-year floodplain.

## 3.3.2 Geology and Hydrology

**General Regional Geology:** The geologic units in the general area of the Site are the Quaternary sand deposits (unit 2), Miocene nonmarine rocks, and Tertiary pyroclastic and volcanic deposits (unit 8). The Quaternary sand deposits consist of unconsolidated eolian and lacustrine deposited sands. The Miocene nonmarine rocks consist of interbedded sandstone, shale, conglomerate, and fanglomerate. The Tertiary unit consists of pyroclastic and volcaniclastic-volcanic breccias (USGS, 2021).

**Soil Conditions:** According to the Soil Conservation Service information provided in the EDR report, the soil components at the Site are Rock Outcrop, Torriorthents, Porterville, and Arizo. No hydrologic characteristics are listed for the Rock Outcrop areas. The Torriorthents and Porterville soils are clayey with Class D hydrologic characteristics and poorly drained. The Arizo soil is sand a gravel with Class A hydrologic characteristics and is excessively drained.



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**Approximate Depth and Flow Direction of Groundwater:** No wells were identified in the EDR report within one-mile of the Site. Therefore, depth to groundwater information cannot be determined. Since groundwater typically follows the general regional topographic gradient of an area, it is assumed to generally flow in an east-northeasterly direction.



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Section 4

# Records Review

## 4.1 Historical Use Information

BC reviewed reasonably ascertainable standard historical sources in an attempt to develop a history of the previous uses or occupancies of the Site and surrounding area. The objective was to identify those uses or occupancies or manufacturing processes that were likely to have led to RECs or HRECs in connection with the Site. BC attempted to identify uses or occupancies of the Site dating from the present back to when the property was undeveloped in all of the historic records. These sources and findings are summarized in the sections which follow.

### 4.1.1 Chain-of-Title Report (50 Years)/Property Deed Review/Environmental Lien Search

BC was not contracted to obtain a 50-year Chain-of-Title report for the Site. According to the ownership information made available through the Environmental Lien and AUL Search report by EDR, the current owner is CalPortland Company. The records were searched back to December 21, 2017 for environmental liens, activity, and use limitations and a deed of ownership. Deeds of ownership are included in the EDR report.

Based on the results of the Environmental Lien and AUL Search by EDR, the Site has had no AULs, leases, Notices of Voluntary Environmental Mitigation Use Restriction (VEMURs), Declarations of Environmental Use Restriction (DEURs), or Environmental liens. The EDR report is included in Appendix D.

### 4.1.2 Historical Aerial Photographs

BC reviewed reasonably ascertainable aerial photographs depicting development of the Site and vicinity as summarized in Table 4-1. The aerial photographs were provided for review by EDR. The quality of evaluation of aerial photography is controlled by the photograph's scale and quality. Copies of the aerial photographs are included in Appendix F.

**Table 4-1. Aerial Photograph Summary**

| Date | Source of Aerial | Site | Adjacent Properties |
|---|---|---|---|
| 1956 | USGS | The Site appears to be undeveloped. Small exploratory excavations near road on east side of Site. | Adjacent properties appear to be undeveloped. A north-south road (Tropico Road) on eastern boundary to the Site. Exploratory digging is evident east of Site across roadway. |
| 1963 | USGS | The Site appears similar to the 1956 aerial photo. Scale is not fully comparable to previous aerial photograph. Eastern portion of the Site not visible. | Dirt roads/tracks in a grid pattern present north of the Site. |
| 1972 | USGS | The Site appears similar to the 1963 aerial photo. | The adjacent area appears similar to the 1963 aerial photo. |

| Table 4-1. Aerial Photograph Summary | | | |
|---|---|---|---|
| Date | Source of Aerial | Site | Adjacent Properties |
| 1977 | USGS | The Site appears similar to the 1972 aerial photo. | Residence northeast of the Site. |
| 1987 | USDA | The Site appears similar to the 1977 aerial photo. | There appears to be a cluster of buildings north east of the Site, west of the north/south road. |
| 1994 | USGS/DOQQ | The Site appears similar to the 1987 aerial photo. | The adjacent area appears similar to the 1987 aerial photo. |
| 2005 | USDA/NAIP | The Site appears similar to the 1994 aerial photo. | The adjacent area appears similar to the 1994 aerial photo. |
| 2009 | USDA/NAIP | The Site appears similar to the 2005 aerial photo. | The adjacent area appears similar to the 2005 aerial photo. |
| 2012 | USDA/NAIP | The Site appears similar to the 2009 aerial photo. | The adjacent area appears similar to the 2009 aerial photo. |
| 2016 | USDA/NAIP | The appears similar to the 2012 aerial photo. | The adjacent area appears similar to the 2016 aerial photo. |

*DOQQ = Digital Orthophoto Quarter Quads; NAIP = National Agriculture Imagery Program; USDA = United States Department of Agriculture; USGS = United States Geological Survey.*

No environmental concerns, RECs, or HRECs were observed in the aerial photographs reviewed.

### 4.1.3 Historical City Directories

EDR conducted a review of available city directories within the vicinity of the Site. BC reviewed the results which did not list the Site associated with any address. Copies of the city directories provided by EDR have been included in Appendix G.

### 4.1.4 Historical Topographic Maps

BC reviewed available historical topographic maps for the vicinity of the Site. The topographic maps were provided by EDR. A brief discussion of each map reviewed is included in Table 4-2. Copies of the maps are provided in Appendix H.



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| Table 4-2. Historical USGS Topographic Map Summary | | | |
|---|---|---|---|
| Date | Map Name | Site | Adjacent Properties |
| 1915 | Elizabeth Lake | The Site area is undeveloped. A north/south road is shown east of the Site. No developments are depicted. | Adjacent properties appear undeveloped. A road (Tropico Road) is adjacent to the Site to the east. |
| 1917 | Elizabeth Lake | The Site appears similar to the 1915 historical topographic map. | The adjacent area is similar to the 1915 historical topographic map. |
| 1943 | Rosamond/Willow Springs | Gravel, sand, clay or borrow pit denoted on Site. | Gravel, sand, clay or borrow pit denoted east of the Site. |
| 1947 | Soledad Mountain | The Site appears similar to the 1943 historical topographical map. | The unimproved north road loop depicted on the 1943 map is depicted as a spur off of the north unimproved road. |
| 1956 | Rosamond | The Site appears similar to the 1947 historical topographical map. Gem Hill label has been included. | The unimproved north road and the unimproved south road are no longer depicted.<br>There are quarries and borrow pits to the east of the southeast of the Site. |
| 1973, 1974 | Soledad Mountain/Willow Springs | Prospects shown on the Site. | Unimproved roads located north of the Site |
| 2012 | Soledad Mountain/Willow Springs | The Site appears similar to the 1973/1974 historical topographic map. | The adjacent areas are similar to the 1973/1974 historical topographic map. |

The excavation activities, adjacent to the Site in historical topographic maps is a potential historical environmental concern due to the possible use of hazardous materials. However, these activities were not observed on-Site in historical topographic or aerial photographs.

### 4.1.5 Sanborn Fire Insurance Maps

The Sanborn Fire Insurance Map series illustrates detailed historical development in some older areas of the metropolitan areas. EDR Private Collection, Library of Congress and University Publications of America maps were requested for the Site and the adjoining properties. EDR certified that there were no maps available for the Site and vicinity. The Sanborn Map Report is provided in Appendix I.

## 4.2 Previous Investigations and Assessments

The Site has a Stormwater Pollution Prevention Plan (SWPPP). A copy of the SWPPP is attached to the Owner-Occupant Questionnaire in Appendix J.

## 4.3 Standard Environmental Regulatory Record Sources

The purpose of the records review is to obtain and review reasonably ascertainable records that will help identify RECs or HRECs in connection with the Site. For this review, records were obtained from EDR. As noted under ASTM E 1527-13, information that is not reasonably ascertainable may not be incorporated into this Phase I ESA report. The msd for the Site vicinity review is noted under each database listed in Table 4-3 based on the ASTM Standard Practice E 1527-13. The EDR report is included in Appendix E.

The review of records was performed keeping in mind that the assumed groundwater flow direction in the vicinity of the Site is northeast. Table 4-3 displays the four of 134 environmental databases



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searched that contained information relative to the Site or other nearby properties. The complete list of the other environmental databases searched is presented in Appendix E.

**Table 4-3. Environmental Database Descriptions and Search Distances**

| Database Name | Minimum Search Distance (Miles) | Number of Listed Sites |
|---|---|---|
| National Pollutant Discharge Elimination System (NPDES) | 1.0 | 1 |
| California Integrated Water Quality System (CIWQS) | 1.0 | 1 |
| CalEPA Regulated Site (CERS) | 1.0 | 1 |
| Mines Mineral Resources Data System (MRDS) | 1.0 | 4 |

The search of the various applicable government agencies by EDR resulted in seven listings at the Site, or within the msd of the Site, which were determined to possibly present an environmental concern to the Site. Those facilities identified with a potential to impact soil and/or groundwater beneath the Site are further discussed below within the applicable subsections.

### 4.3.1 Site Address Listings

Six of the seven listings found by EDR during the database search are within the Site property boundary. The Site was identified in four of the databases searched by EDR: NPDES, CIWQS, CERS, and Mines MRDS. These listing correlate to construction activities by CalPortland. The NPDES and CIWQS listings have a termination data of November 2019. BC has reviewed these listings and does not find them to be a REC.

### 4.3.2 Site Vicinity Listings

The remaining listing, Mines MRDS, located to the southeast of the Site across Mojave-Tropico Road is not considered to be an environmental concern for the Site based on the location with respect to the Site.

## 4.4 Vapor Encroachment Screening

BC performed a Tier 1 VES for the Site in accordance with ASTM Standard Guide E2600-15. This VES was completed in conjunction with ASTM E1527-13 for Phase I ESAs. The purpose of the VES was to identify VECs for the Site or Target Property (TP).

The term VEC is defined by ASTM (2015) as:

> The presence or likely presence of chemicals of concern vapors in the vadose zone of the target property caused by the release of vapors from contaminated soil and/or groundwater either on or near the target property as identified by the Tier 1 or Tier 2 procedures in ASTM Standard Guide E2600-15.

A Tier 1 VES identifies any known or suspect contaminated properties with volatile or semi volatile hazardous substances or petroleum products, referred to as chemicals of concern (COCs), within an area of concern (AOC). The AOC for non-petroleum hydrocarbon COCs is a 1,760-foot (1/3-mile) radius from the contaminated property to the boundary of the Site. For properties with petroleum hydrocarbon COCs, the AOC is a 528-foot (1/10-mile) radius. The AOC can be reduced if groundwater flow direction is known or inferred using *approximate* msd of a COC. A *critical distance*, the estimated linear distance in any direction in which COC vapors from contaminated groundwater or soil might migrate in the vadose zone to the TP, is 100 feet for non-petroleum hydrocarbon COCs and



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light non-aqueous phase liquid petroleum hydrocarbon COCs. The critical distance for dissolved-phase petroleum hydrocarbons is 30 feet.

According to the EDR VES Report, no facilities were identified by EDR within the AOC for the Site. The EDR VES Report is provided in Appendix K.

## 4.5 Additional Environmental Record Sources

Additional sources of records that were reviewed for this assessment are briefly discussed below.

### 4.5.1 Building Permit Report

A Building Permit Report was ordered from EDR. EDR does not have access to building permits for the Site. A copy of the EDR Building Permit Report is included in Appendix L.

### 4.5.2 Property Information

A Property Tax Map Report was obtained from EDR which provides information on boundaries of the Site and neighboring properties, addresses, parcel identification numbers, as well as other data typically used in property location and identification. A copy of the EDR Property Tax Map Report is included in Appendix M.



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Section 5

# Interviews

The purpose of interviews is to obtain information indicating RECs, CRECs or HRECs in connection with the Site, as described in ASTM E 1527-13. Selected individuals who were knowledgeable about current and past Site operations were interviewed. The following is a brief summary of the information obtained about the Site.

## 5.1 Interviews with Owners, Occupants, and Others Knowledgeable of the Site

This section summarizes the interviews conducted with individuals who may have knowledge concerning the Site. The interviews were conducted by BC either in person or over the telephone.

**Table 5-1. Summary of Interviews with Owners, Occupants, and Others**

| | |
|---|---|
| Owner/Occupant | Alison Brewer |
| Date | January 18, 2021 |
| Knowledge of Site | Environmental Specialist |
| Pertinent Information | Guided BC throughout the Site and completed the Owner/Occupant Questionnaire (Appendix J). During the Site Reconnaissance, Ms. Brewer provided the following information:<br>• The Site is vacant land and first developed following a grading plan approval in 2019.<br>• The Site has been vacant, unused land in the past.<br>• No utilities are present at the Site.<br>• The Site has a current Stormwater Pollution Prevention Plan (SWPPP).<br>• The Site has an approved Grading Plan. |
| Other | Kern County Fire Department |
| Date | January 21, 2021 |
| Knowledge of Site | Public Records |
| Pertinent Information | The Fire Department had no knowledge of any environmental instances occurring at the Site. |

## 5.2 Local Government Agency Interviews

BC submitted Freedom of Information Act (FOIA) requests to various regulatory agencies and the information in the documents that were provided by the responding regulatory agencies are summarized below.

### 5.2.1 Kern County Public Health Services Department

The Kern County Public Health Services Department stated that no records exist pertaining to the Site.

### 5.2.2 Mojave Desert Air Quality Management District

BC contacted the Mojave Desert Air Quality Management District and they stated that no records exist pertaining to the Site. However, it was determined at the time of this Report the Site is within the Eastern Kern Air Pollution Control District (APCD).

### 5.2.3 Mojave Desert Air Quality Management District

BC contacted the Eastern Kern APCD. The Eastern Kern APCD database did not produce any records for the Site parcel numbers.

### 5.2.4 Geotracker

Geotracker stated that no records exist pertaining to the Site.



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Section 6

# Site Reconnaissance

The Site was inspected on foot where possible and by vehicle by travelling undeveloped roads at the Site that were safely passable at such intervals that the entire Site could be viewed, except areas that were covered with vegetation or blocked by debris and materials. The Site boundaries and adjoining properties were viewed, and observations recorded during the Site visit.

The objective of the Site reconnaissance was to identify potential RECs in connection with the Site. The success of this activity can be limited by weather conditions, bodies of water, adjacent buildings, or other obstacles. Any limitations are noted below:

- Brown and Caldwell was unable to observe all surface areas of the Site, due to the size of the property, topography, and limited access roads.

## 6.1 Site Observations

BC conducted a Site visit on January 22, 2021. The weather conditions were noted as partly cloudy. The Site visit was conducted by Sandy English, a BC employee. Site photographs are included in Appendix N. During the Site visit, BC was accompanied by CalPortland representatives, Alison Brewer and Desirea Haggard.

The Site consists of approximately 778.14 acres of undeveloped land, located in Kern County, California, approximately five miles to the northwest of Rosamond, California. See Figure 2 for the Site Map.

### 6.1.1 Site Improvements and Features

**Structures:** No structures or other man-made features were observed on the Site. No evidence of former structures were observed.

**Pavement, Roads, and Driveways:** The Site is undeveloped. There is an access road that connects the main entrance off of Mojave-Tropico Road to two graded pads. Various dirt tracks exists across the Site from nearby residents operating vehicles at the site for recreational purposes.

**Fences or Walls:** The Site is not fenced.

**Other Features:** BC did not observe any other notable features at the Site.

### 6.1.2 Site Physical Observations

**Surface Stains:** BC did not observe surface stains during the Site visit.

**Unusual Odors:** BC did not observe unusual odors attributable to the Site during the Site visit.

**Stressed Vegetation**: Stressed vegetation was not observed by BC during the Site visit.

**Storage Tanks**: BC did not observe any storage tanks during the Site visit.

**Drums, Other Containers**: BC did not observe any drums or containers during the Site visit.

**Floor Drains, Grates, Sumps, Catch Basins, Oil Water Separators**: BC did not observe any floor drains, grates, sumps, catch basins or oil/water separators at the Site during the Site visit.

**Stationary Hydraulic Lifts or Elevators (below grade or above grade)**: BC did not observe any hydraulic lifts or elevators during the Site visit.

**Transformers or Other Sources of Polychlorinated Biphenyls:** BC did not observe any electrical transformers, capacitors, or other sources of polychlorinated biphenyls (PCBs) at the Site during the Site visit.

**Paint Booth, Wash Rack, Other**: BC did not observe any paint booths, wash racks, or sand blasting at the Site during the Site visit.

### 6.1.3 Surface and Drainage Observations

**Pavement Cracks or Patching**: No concrete or asphalt pavement is present.

**Fill Dirt or Previous Fill Activities**: There was no evidence of filling activity observed on the property.

**Ponds, Pits, Lagoons, Retention Basins**: There were no ponds, pits, lagoons, or retention basins observed or reported at Site.

**Storm Sewer (Flow of Stormwater across Site)**: Based on Site topography, stormwater likely flows in a northerly, easterly, and southernly direction. However, local variations in the ground surface may impact the flow direction of surface stormwater.

### 6.1.4 Water Wells, Dry Wells, and Monitoring Wells

BC did not observe water wells, dry wells or monitoring wells at the Site.

### 6.1.5 Material and Waste Storage Areas

**Solid Waste**: BC did not observe any indications of solid waste service at the Site.

**Hazardous Materials, Petroleum Products, and/or Waste Storage Areas**: BC did not observe hazardous materials, petroleum products, or waste storage areas.

### 6.1.6 Wastewater Systems

**Septic Systems, Leach Fields or Other On-Site Disposal Systems**: BC did not observe evidence of former or current septic systems at the Site.

**Municipal or Other Sewer**: BC did not observe municipal or other sewer manholes at the Site.

### 6.1.7 Site Utilities

The Site is currently vacant, generally undeveloped land, and there appears to be no utility service.

### 6.1.8 Environmental Concerns Observed on Adjoining Properties

Adjoining properties were visually observed to the degree possible without trespass for potential RECs that have the potential to impact the Site. Reconnaissance of adjoining properties was performed by driving/walking the areas. No environmental concerns other than those identified above were observed on the adjacent properties during the Site visit.

### 6.1.9 Other Pertinent Information from Site Visit

**Other Concerns Raised by Site Visit**: No other environmental concerns were observed during the Site visit.



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Section 7

# Opinions, and Conclusions

## 7.1 Data Failures and Gaps

Through the course of this assessment, BC may have encountered data failures or data gaps. These failures or gaps, if any, are discussed below. The following provides the opinion of the EP as to the significance of the data gaps in terms of defining RECs at the Site. Data failures may or may not be significant data gaps, and the discussion also provides information pertaining to whether the data failures resulted in significant data gaps.

### 7.1.1 Data Failures

Data failure is a failure to achieve the historical (property use) research objectives specified in ASTM E 1527-13 even after reviewing the eight standard historical sources that are reasonably ascertainable and likely to be useful. Data failure is one type of data gap.

No data failures were identified during this review.

### 7.1.2 Data Gaps

A data gap is a lack of, or inability to obtain, information required by ASTM E 1527-13, despite good faith efforts by the EP to gather such information. This could include any component of ASTM E 1527-13; e.g., standard environmental records, interviews, or a complete reconnaissance. A data gap by itself is not inherently significant; however, if other information and/or the EP's experience raise reasonable concerns about the gap, it may be judged to be significant.

- Aerial photographs and other historical records were not available at five-year intervals as required under ASTM E 1527-13. This resulted in a data gap for years that records were not available regarding the area of the Site.
- Time gaps of more than five years were noted in available historical information. BC does not believe that this deviation precludes the ability to render an opinion regarding potential RECs or de minimis conditions for the Site or the conclusions or recommendations of this report.
- BC was unable to observe all surface areas of the Site, due to the size of the property, topography, and limited access roads.

These data gaps were determined to be insignificant based on the totality of BC's assessment.

## 7.2 Conclusions

Based on the results of this Phase I ESA, BC has drawn the following conclusions with regard to the Site.

### 7.2.1 RECs

This Phase I ESA has revealed no evidence of RECs in connection with the Site.

### 7.2.2 CRECs

This Phase I ESA has identified no evidence of CRECs in connection with the Site.



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### 7.2.3 HRECs

This Phase I ESA has identified no evidence of HRECs in connection with the Site.

### 7.2.4 Environmental Concerns and De Minimis Conditions

This Phase I ESA has revealed no de minimis conditions connection with the Site.

This Phase I ESA has identified no environmental concerns in connection with the Site.

## 7.3 Environmental Professional's(s') Statement and Signature(s)

We declare that, to the best of our professional knowledge and belief, we meet the definition of EPs as defined in § 312.10 of 40 CFR 312. We have the specific qualifications based on education, training, and experience to assess a property. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR 312.



Corey Strauss
Project Geologist



Kristene Wilder,
Managing Hydrogeologist



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Section 8

# Environmental Professionals' Qualifications

BC personnel involved with this project are listed below along with pertinent information regarding their qualifications and specialized knowledge. Additional details regarding each listed professional have been included in Appendix O.

BC EPs conducting the assessment include: Corey Strauss and Kristene Wilder



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## Section 9

# References


40 CFR 312, Standards and Practices for All Appropriate Inquiries; Final Rule, November 2005 (AAI Rule).

American Society for Testing and Materials, 2013, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, E1527-13.

American Society for Testing and Materials, 2015, *Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*, E2600-15.

Environmental Data Resources, Inc., *EDR Radius Map with Geocheck*, Inquiry number 6336067.2S, January 19, 2021.

Environmental Data Resources, Inc., *EDR Historical Topographic Map Report*, Inquiry number 6336067.4, January 20, 2021.

Environmental Data Resources, Inc., *EDR Aerial Photo Decade Package*, Inquiry number 6336067.11, January 21, 2021.

Environmental Data Resources, Inc., *Certified Sanborn Map Report*, Inquiry number 6336067.3, January 21, 2021.

Environmental Data Resources, Inc., *EDR Building Permit Report*, Inquiry number 6336067.8, January 19, 2021.

Environmental Data Resources, Inc., *EDR Vapor Encroachment Screen*, Inquiry number 6336067.2S, January 26, 2021.

Environmental Data Resources, Inc., *EDR City Directory Image Report*, Inquiry 6336067.5, January 20, 2021.

Environmental Data Resources, Inc., *EDR Environmental Lien and AUL Search*, Inquiry number 6336067.7, January 20, 2021.

Environmental Data Resources, Inc., *EDR Property Tax Map Report*, Inquiry number 6336067.6, January 19, 2021.

Kern County Planning and Natural Resources Department. https://kernplanning.com/general-plan-update/interactive-maps/

USGS, 2021. Geologic Maps of the US States. https://mrdata.usgs.gov/geology/state/

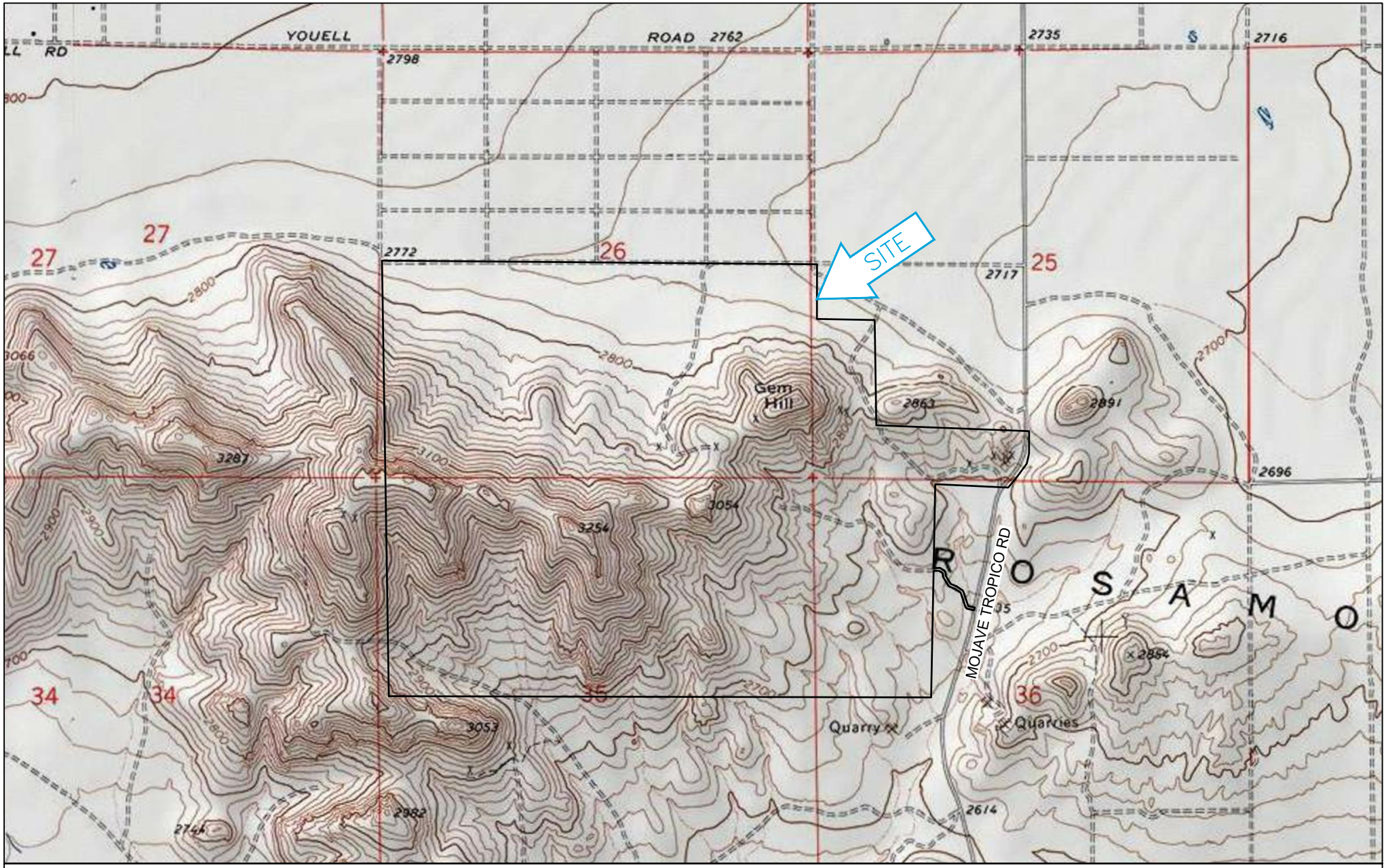
# Figures

**Figure 1. Site Location Map**

**Figure 2. Site Map**



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SCALE IN MILES

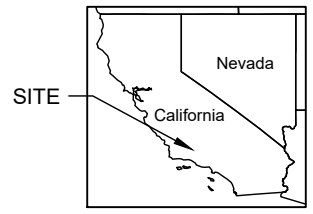
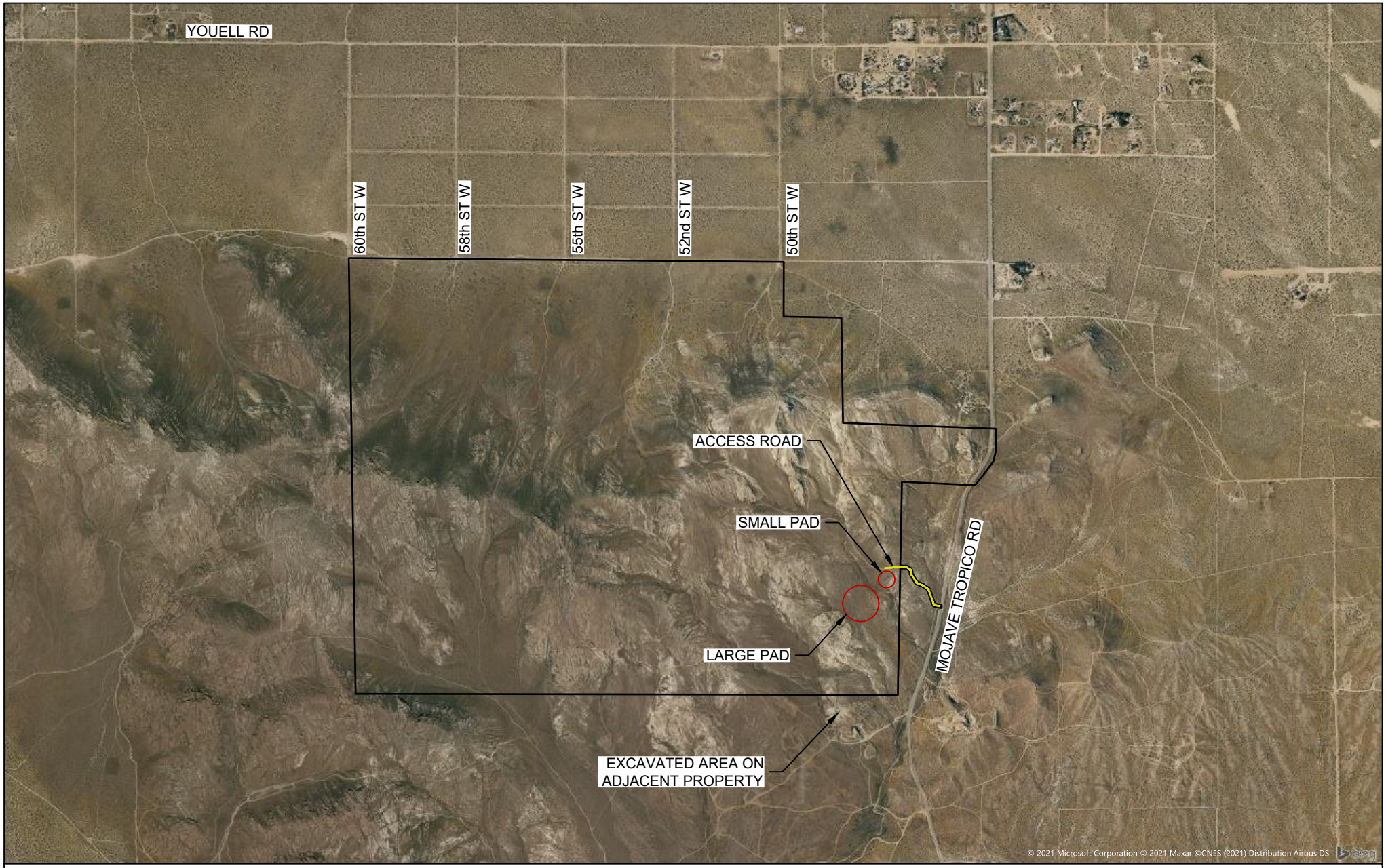



**Figure 1**
**SITE LOCATION MAP**

Brown AND Caldwell

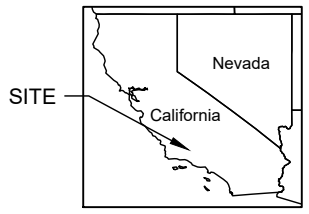



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SCALE IN MILES

Brown AND Caldwell

**Figure 2**
**SITE MAP**




N

# Appendix A: Detailed Scope of Work



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## Appendix A

# Detailed Scope of Work

Consultant will perform a Phase I Environmental Site Assessment (ESA) of the Sites identified by the client in accordance with American Society for Testing and Materials (ASTM) Standard Practice E 1527-13 (ASTM E 1527-13). The scope of these services will include the following tasks. All italicized terms refer to the definitions set forth in the ASTM Standard. All work will be performed under the supervision of a qualified *environmental professional* (EP). The Phase I ESA will be performed to satisfy all appropriate inquiry as defined in CERCLA, 42 U.S.C. § 9601(35)(b) as clarified by 40 CFR 312, that will qualify a party to a commercial real estate transaction for one of the threshold criteria for satisfying the Landowner Liability Protections to CERCLA liability. The objective of this Phase I ESA is to identify, to the extent feasible pursuant to the processes described in ASTM E 1527-13, *recognized environmental conditions* (RECs) in connection with the Site.

### Task 1.0 – Records Review

Consultant will obtain and review *reasonably ascertainable* and *practically reviewable* records in an attempt to identify RECs in connection with the Site. Records may be obtained directly from various governmental agencies and other sources or from a commercial database search company. The records will include the following *standard environmental record sources* within the designated minimum search distances:

| Environmental Record Sources and Search Distances | |
|---|---|
| **List** | **Minimum Search Distance (Miles)** |
| Federal NPL Site List | 1.0 |
| Delisted NPL Site List | 0.5 |
| Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) List | 0.5 |
| Federal CERCLIS No Further Remedial Actions Planned (NFRAP) Site List | 0.5 |
| Federal RCRA CORRACTS Facility List | 1.0 |
| Federal RCRA non-CORRACTS TSDF List | 0.5 |
| Federal RCRA Generator List | property & adjoining properties |
| Federal institutional control registries | property only |
| Federal engineering control registries | 0.5 |
| Federal ERNS List | property only |
| State and tribal lists of hazardous waste sited identified for Investigation or remediation: | |
| • State- and Tribal-equivalent NPL | 1.0 |
| • State- and Tribal-equivalent CERCLIS | 0.5 |
| • State and Tribal Landfill and/or Solid Waste Disposal Sites List | 0.5 |
| • State and Tribal Registered storage tank Lists | property & adjoining properties |

| Environmental Record Sources and Search Distances | |
|---|---|
| List | Minimum Search Distance (Miles) |
| • State Reported Leaking Storage Tank Lists | 0.5 |
| • State and Tribal Engineering Control Registries | 0.5 |
| • State and Tribal Institutional Control Registries | property only |
| • State and Tribal Voluntary Cleanup Sites | 0.5 |
| • State and Tribal Brownfield Sites | 0.5 |

If the property or any of the adjoining properties is identified on one or more of the standard environmental record sources above, pertinent regulatory files and/or records associated with the listing and should be reviewed in accordance with Section 8.1.1 through 8.1.8 of ASTM E-1527. As an alternative, the EP may review files/records from an alternative source(s) (for example, onsite records, user provided records, records from local government agencies, interview with regulatory officials or other individuals knowledgeable about the environmental conditions that resulted in the standard environmental record source listing, etc.). A summary of the information obtained from the file/record review shall be included in the report and the EP must include in the report his/her opinion on the sufficiency of the information obtained from the files/records review to evaluative the existence of a *recognized environmental condition*, *historical recognized environmental condition*, *controlled recognized environmental condition*, or a *de minimis condition*.

### Subtask 1.1 – Additional Environmental Record Sources

The records may include one or more of the following *additional environmental record sources*, at the discretion of the EP, to enhance and supplement the federal and state sources identified above.

| Additional Environmental Record Sources and Search Distances | |
|---|---|
| List | Minimum Search Distance (Miles) |
| Brownfields Sites | 0.5 |
| Local or County Lists of Landfill/Solid Waste Disposal Sites | 0.5 |
| Records of Emergency Release Reports (SARA 304) | property only |
| Records of Contaminated Public Wells | 0.5 |
| Fire Department | property only |
| List of Local or County Hazardous Waste/contaminated sites | 0.5 |
| Lists of Local or County Registered storage tanks | property & adjoining properties |
| Local Land Records (for AULs) | property only |
| Local Water Quality Agency | 0.5 |
| Local Electric Utility Companies (for information relating to Polychlorinated Biphenyls (PCBs) | property only |

The following potential sources for local records may be considered, although the list is not comprehensive and other sources may be used.

- Local or County Department of Health/Environmental Division
- Local or County Fire Department



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- Local or County Planning Department
- Local or County Building Permit/Inspection Department
- Local/Regional Pollution Control Agency
- Local/Regional Water Quality Agency
- Local Electric Utility Companies (for records relating to PCBs)

### Subtask 1.2 – Standard Physical Setting Source

Consultant will review a current USGS 7.5 Minute Topographic Map showing the area on which the Site is located, provided it is *reasonably ascertainable*. Other physical setting sources that are reasonably credible (as well as reasonably ascertainable) may be reviewed at the discretion of the EP in order to assess the impact of migration on RECs in connection with the Site.

### Subtask 1.3 – Standard Historical Sources

Consultant will review *reasonably ascertainable standard historical sources* in an attempt to develop a history of the previous uses or occupancies of the Site and surrounding area. The objective will be to identify those uses or occupancies that are likely to have led to RECs in connection with the Site. Consultant will attempt to identify all obvious uses or occupancies of the Site from the present dating back to the Site's obvious first developed use or to 1940, whichever is earlier. At least one of the standard historical sources will be researched to 1940, or a combination of historical sources will be used to determine the use or occupancies of the Site dating back to 1940, or until the Site was first developed. Search intervals will be a minimum of 5 years or as such to adequately establish the Site history within the extent records are *reasonably ascertainable*. The following sources may be consulted:

1. Aerial Photographs[1]
2. Fire Insurance Maps
3. Property Tax Files
4. Recorded Land Title Records[2]
5. USGS 7.5 Minute Topographic Maps
6. Local Historical Street Directories
7. Building Department Records
8. Zoning/Land Use Records

[1] Aerial photographs should be of sufficient scale to identify areas of development and activity encompassing the Site

[2] BC did not obtain a 50-year Chain-of-Title to conduct a search for environmental liens. The chain-of-title search was not requested by Client.

After checking all *reasonably ascertainable standard historical sources*, whatever history of previous uses of the Site are available shall be deemed sufficient to comply with ASTM E 1527-13. Data failure and/or no findings will be documented in the report and the consultant will comment upon the significance of the data gaps.

## Task 2.0 – Site Reconnaissance

In accordance with the agreed upon project schedule, *consultant will conduct a site visit to the Site during which the periphery of the Site shall be* physically and visually observed, as well as any structure(s) located on the Site, to the extent the property or structures are not obstructed by bodies of water, adjacent buildings or other obstacles. The methodology used to observe the property will be



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documented in the report, as well as limitations imposed by physical obstacles and limiting conditions. The *site visit* will address the following:

- **General Site Setting:** Current use of the Site, adjoining properties, and surrounding area; past uses of the Site, adjoining properties, and surrounding area, as indicated by the site reconnaissance; and geologic, hydrogeologic, hydrologic and topographic conditions for the Site. As indicated by visual observations; roads and structures on the Site; the source of potable water; the sewage disposal system for the Site; and storm water conveyance for the Site.
- **Interior Observations:** The means of heating and cooling the buildings on the Site, including the fuel source. Stains/corrosion, on floors and walls, floor drains, and sump pits, to the extent they are visually or physically observed or identified from interviews, and any odors detected shall be described in the report.
- **Exterior Observations:** The presence of hazardous substances and petroleum products materials including, but not limited to, PCBs, pesticides, above or below ground fuel/chemical storage tanks and pipelines, drums, transformers, drains, sumps, drywells, unidentified substance containers, unusual land colorations, and odors and physical irregularities. The presence of wells, stressed vegetation from other than insufficient water, pits, ponds or lagoons, and stained soil, gravel or pavement. The presence of wastewater discharges to surface waters, septic systems, drains, drywells, holding ponds and public sewer systems. The presence of systems to dispose of solid wastes and other liquid waste. The presence of fill material other than landscaping material. The presence of abandoned equipment and materials.
- **Adjoining Properties:** This will include a visual examination, to the degree possible without trespass, of land use conditions that may adversely affect the Site including: underground or aboveground storage tanks; pits, ponds, and lagoons; landfills; stains, wells, odors, distressed vegetation, chemical storage areas, or other obvious indications of *recognized environmental conditions*.

## Task 3.0 – Interviews with Owners and Occupants

Consultant will make reasonable attempts to interview current and past *owners* or *occupants* of the Site to obtain information regarding RECs in connection with the Site. At a minimum, the current *owners/occupants* will be interviewed. Prior to the site visit, Client will identify a person with good knowledge of the operations and/or uses of the Site. Prior to the site visit, Client will endeavor to provide, or cause to be provided, to consultant a copy of the current property deed and boundary map, any applicable environmental permits, environmental site assessment reports, environmental audits, registration information for USTs, hazardous waste generator reports, manifests, material safety data sheets, environmental violation notices or environmental liens, or other documents applicable to an evaluation of RECs on the site, of which Client or *key site person* are aware.

Consultant may utilize an Owner/Occupant Questionnaire as the form of written interview, supplemented by verbal interview(s). If Consultant uses an Owner/Occupant Questionnaire completed by the designated Owner/Occupant representative, the Questionnaire shall be included in the written report.

BC may utilize a User Questionnaire to be completed by the Client. The User Questionnaire may be completed by BC through a telephone interview with the Client. The completed User Questionnaire should be completed prior to beginning the Phase I ESA and will be included in the final report.

## Task 4.0 – Interviews with Local Government Officials

Consultant shall make reasonable attempts to interview local government officials to obtain information regarding RECs in connection with the Site. A reasonable attempt shall be made to



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interview a staff member from the local fire department, and the county health agency for information regarding hazardous waste disposal, past or present USTs, and septic tank information. Consultant shall make reasonable attempts to investigate and record the provisions of utilities such as water, sewer, electricity, and natural gas on the Site. It should be noted that responses from local government officials may not be received within the time allotted for this assessment and will not be included in such instances.

Information requested from a representative of the local fire department should include information on past hazardous materials incidents, hazardous materials permits, knowledge of current or former USTs or above-ground storage tanks (ASTs), citations or violations, certificates of occupancy, or other information that may be in their files for the Site address (current or former occupants). If no information is available from the local fire department or if the files were purged after some amount of time, that fact will be recorded in the report.

Interview(s) may, at the discretion of Brown and Caldwell, be conducted with representatives of the local building department, planning and zoning authority, code enforcement office, public works department, local health/environmental department, etc., as necessary to establish prior uses of the Site and gather data required to complete the report. Information that may be requested that may be in their files for the Site address (current or former occupants) may include but not be limited to: permits for installation, operation, removal or demolition of structures or equipment at the Site, including but not limited to ASTs, USTs or washracks. If no information is available or if the files are purged after some period of time, that fact will be recorded in the report.

## Task 5.0 – Evaluation and Report Preparation

If agreed upon in the contract scope of services between Client and Consultant, the Consultant may provide verbal or preliminary results after completion of the site visit and prior to producing the report if requested by the Client. The preliminary report may include a preliminary listing of RECs and recommendations based solely on the observations and interviews conducted during the site visit, excluding information from record reviews and other interviews.

After completion of the site visit, consultant shall provide the agreed upon number of copies of Phase I ESA final report to the Client.

The analysis, opinions and conclusions provided in the Phase I ESA report will include documentation of all sources, including those that revealed no findings. The report shall include a Site Location Map and a Site Diagram. Color copies of applicable site photographs shall be attached as appendices to the Phase I ESA report. Commercial governmental record search company's reports, if used, shall be attached as appendices to the Phase I ESA report. Credentials of the EP(s) involved in conducting the Phase I ESA will be provided. The EP(s) responsible for the Phase I ESA shall sign the report.

The report shall state whether Client reported to the EP any information pursuant to the user's responsibilities through inclusion of the completed User Questionnaire or suitable alternative.

The report shall include the EP's opinion of the impact of RECs in connection with the Site. The report shall have a findings and conclusions section that states one of the following:

> "Consultant has performed a Phase I Environmental Site Assessment, in conformance with the scope and limitations of ASTM Practice E 1527, of the Site. Any exceptions to, or deletions from, this practice are described in Section [ ] of this report. This assessment has revealed no evidence of RECs in connection with the Site," or
>
> "Consultant has performed a Phase I Environmental Site Assessment, in conformance with the scope and limitations of ASTM Practice E 1527, of the Site. Any



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> exceptions to, or deletions from, this practice are described in Section [ ] of this report. This assessment has revealed no evidence of RECs in connection with the property except for the following: (provide list)."

The report will be signed by the EP and will include the following statement by the EP:

> "I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in § 312.10 of 40 CFR 312" and
>
> "I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Site. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

All deletions and deviations from this practice (if any) shall be listed individually and in detail in the report and all additions shall be listed.

## Exclusions

This Scope of Services does not include an evaluation of the following issues, which are not addressed in the AAI Rule or the ASTM standard.

- Asbestos-Containing Building Materials
- Radon
- Lead-Based Paint
- Lead in Drinking Water
- Wetlands
- Regulatory Compliance
- Cultural and Historic Resources
- Industrial Hygiene
- Health and Safety
- Ecological Resources
- Endangered Species
- Mold
- Biological Agents
- Indoor Air Quality unrelated to releases of hazardous substances or petroleum into the environment



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# Appendix B: Definitions and Description of Terms Specific to the ASTM Standard



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## Appendix B

# Definitions and Description of Terms Specific to the ASTM Standard

**Abandoned property –** property that can be presumed to be deserted, or an intent to relinquish possession or control can be inferred from the general disrepair or lack of activity thereon such that a reasonable person could believe that there was an intent on the part of the current owner to surrender rights to the property.

**Activity and use limitations (AULs) –** legal or physical restrictions or limitations on the use of, or access to, a site or facility: (1) to reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil, soil vapor, ground water, and/or surface water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions, which may include institutional and/or engineering controls, are intended to prevent adverse impacts to individuals or populations that may be exposed to hazardous substances and petroleum products in the soil, soil vapor, surface water on the property.

**Actual knowledge -** the knowledge actually possessed by an individual who is a real person, rather than an entity. Actual knowledge is to be distinguished from constructive knowledge that is knowledge imputed to an individual or entity.

**Adjoining properties -** any real property or properties the border of which is contiguous or partially contiguous with that of the property, or that would be contiguous or partially contiguous with that of the property but for a street, road, or other public thoroughfare separating them.

**Aerial photographs -** photographs taken from an aerial platform with sufficient resolution to allow identification of development and activities of areas encompassing the property.

**All Appropriate Inquiry -** that inquiry constituting "all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in CERCLA, 42 USC § 9601(35)(B), that will qualify a party to a commercial real estate transaction for one of the threshold criteria for satisfying the landowner liability protections (LLPs) to CERCLA liability (42 USC § 9601(35)(A) and (B), § 9607(b)(3)), § 9607(q), and § 9607(r) assuming compliance with other elements of the defense.

**Approximate minimum search distance (msd) -** the area for which records must be obtained and reviewed pursuant to Section 8 of ASTM E 152713, subject to the limitations provided in that section. This may include areas outside the property and shall be measured from the nearest property boundary. This term is used in lieu of radius to include irregularly shaped properties.

**Bona fide prospective purchaser liability protection –** (42 USC § 9607(r)) - a person may qualify as a bona fide prospective purchaser if, among other requirements, such person made “all appropriate inquiries into the previous ownership and uses of the facility in accordance with generally accepted good commercial and customary standards and practices.” Knowledge of contamination resulting

from all appropriate inquiry would not generally preclude this liability protection. A person must make all appropriate inquiry on or before the date of purchase. The facility must have been purchased after January 11, 2002. See Appendix X1 of ASTM E 1527-13 for the other necessary requirements that are beyond the scope of this practice.

**Brownfields Amendments** – amendments to CERCLA pursuant to the Small Business Liability Relief and Brownfields Revitalization Act, Pub. L. No. 107-118 (2002), 42 U.S.C. §§ 9601 *et. Seq*.

**Building department records -** those records of the local government in which the property is located indicating permission of the local government to construct, alter, or demolish improvements on the property.

**Business Environmental Risk** - a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice. The scope of business environmental risk work, if included in the project, is specified by the Client/User.

**Commercial real estate -** any real property except a dwelling or property with no more than four dwelling units exclusively for residential use (except that a dwelling or property with no more than four dwelling units exclusively for residential use is included in this term when it has a commercial function, as in the building of such dwellings for profit). This term includes but is not limited to undeveloped real property and real property used for industrial, retail, office, agricultural, other commercial, medical, or educational purposes; properties used for residential purposes that has more than four residential dwelling units; and property with no more than four dwelling units for residential use when it has a commercial function, as in the building of such dwellings for profit.

**Commercial real estate transaction -** a transfer of title to or possession of real property or receipt of a security interest in real property, except that it does not include transfer of title to or possession of real property or the receipt of a security interest in real property with respect to an individual dwelling or building containing fewer than five dwelling units, nor does it include the purchase of a lot or lots to construct a dwelling for occupancy by a purchaser, but a commercial real estate transaction does include real property purchased or leased by persons or entities in the business of building or developing dwelling units.

**Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) -** the list of sites compiled by USEPA that USEPA has investigated or is currently investigating for potential hazardous substance contamination for possible inclusion on the National Priorities List.

**Construction debris -** concrete, brick, asphalt, and other such building materials discarded in the construction of a building or other improvement to property.

**Contaminated public wells -** public wells used for drinking water that have been designated by a government entity as contaminated by hazardous substances (e.g., chlorinated solvents), or as having water unsafe to drink without treatment.

**Contiguous property owner liability protection –** (42 USC § 9607(q)) - a person may qualify for the contiguous property owner liability protection if, among other requirements, such person owns real property that is contiguous to, and that is or may be contaminated by hazardous substances from other real property that is not owned by that person. Furthermore, such person conducted all appropriate inquiry at the time of acquisition of the property and did not know or have reason to know that the property was or could be contaminated by a release or threatened release from the contiguous property. The all appropriate inquiry must not result in knowledge of contamination. If it



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does, then such person did “know” or “had reason to know” of contamination and would not be eligible for this protection. See Appendix X1 of ASTM E 1527-13 for the other necessary requirements that are beyond the scope of this practice.

**Controlled recognized environmental condition (CREC) –** a *recognized environmental condition* resulting from a past release of *hazardous substances* or *petroleum products* that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with *hazardous substances* or *petroleum products* allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, AULs, institutional controls, or engineering controls). A condition considered by the environmental professional to be a *controlled recognized environmental condition* shall be listed in the findings section of the Phase I *Environmental Site Assessment* report, and as a *recognized environmental condition* in the conclusions’ sections of the Phase I *Environmental Site Assessment* report.

**CORRACTS list** – a list maintained by EPA of hazardous waste treatment, storage, or disposal facilities and other RCRA-regulated facilities (due to past interim status or storage of hazardous waste beyond 90 days) that have been notified by the USEPA to undertake corrective action under RCRA. The CORRACTS list is a subset of the EPA database that manages RCRA data.

**Data failure** – a failure to achieve the historical research objectives in Sections 8.3.1 through 8.3.2.2 of the ASTM E 1527-13 even after reviewing the standard historical sources in 8.3.4.1 through 8.3.4.8 that are reasonably ascertainable and likely to be useful. It is one type of data gap.

**Data gap** – a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. Data gaps may result from incompleteness in any of the activities required by this practice, including, but not limited to site reconnaissance (for example, an inability to conduct the site visit), and interviews (for example, an inability to interview the key site manager, regulatory officials, etc.).

**De minimis condition –** a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis conditions* are not RECs nor CRECs.

**de minimis condition** – a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

**Demolition debris -** concrete, brick, asphalt, and other such building materials discarded in the demolition of a building or other improvement to property.

**Drum -** a container (typically, but not necessarily, holding 55 gallons (208 L) of liquid) that may be used to store hazardous substances or petroleum products.

**Dry wells -** underground areas where soil has been removed and replaced with pea gravel, coarse sand, or large rocks. Dry wells are used for drainage, to control storm runoff, for the collection of spilled liquids (intentional and non-intentional) and wastewater disposal (often illegal).

**Due diligence -** the process of inquiring into the environmental characteristics of a parcel of commercial real estate or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes.

**Dwelling -** structure or portion thereof used for residential habitation.



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**Engineering controls (EC)** – physical modifications to a site or facility (for example, capping, slurry walls, or point of use water treatment) to reduce or eliminate the potential for exposure to hazardous substances or petroleum products in the soil or ground water on the property. Engineering controls are a type of AUL.

**Environment –** environment shall have the same meaning as the definition of environment in CERCLA 42 U.S.C. § 9601(8)).

**Environmental compliance audit -** the investigative process to determine if the operations of an existing facility are in compliance with applicable environmental laws and regulations. This term should not be used to describe Practice E 1527 (Phase I Environmental Site Assessment), although an environmental compliance audit may include an environmental site assessment or, if prior audits are available, may be part of an environmental site assessment.

**Environmental lien -** a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous substances or petroleum products upon a property, including (but not limited to) liens imposed pursuant to CERCLA 42 USC § 9607(1) and 9607(r) and similar state or local laws.

**Environmental Professional (EP) -** a person meeting the education, training, and experience requirements as set forth in 40 CFR § 312.10(b).

**Environmental Site Assessment (ESA) -** the process by which a person or entity seeks to determine if a particular parcel of real property (including improvements) is subject to RECs. At the option of the user, an environmental site assessment may include more inquiry than that constituting all appropriate inquiry or, if the user is not concerned about qualifying for the LLPs, less inquiry than that constituting all appropriate inquiry. An environmental site assessment is both different from and often less rigorous than an environmental compliance audit.

**ERNS list -** USEPA's Emergency Response Notification System (ERNS) list of reported CERCLA hazardous substance releases or spills in quantities greater than the reportable quantity, as maintained at the National Response Center. Notification requirements for such releases or spills are codified in 40 CFR Parts 302 and 355.

**Federal Register (FR) -** publication of the United States government published daily (except for federal holidays and weekends), containing all proposed and final regulations and some other activities of the federal government. When regulations become final, they are included in the Code of Federal Regulations (CFR), as well as published in the Federal Register.

**Fill dirt -** dirt, soil, sand, or other earth, that is obtained offsite that is used to fill holes or depressions, create mounds, or otherwise artificially change the grade or elevation of real property. It does not include material that is used in limited quantities for normal landscaping activities.

**Fire insurance maps -** maps produced for private fire insurance companies that indicate uses of properties at specified dates and that encompass the property.

**Good faith –** the absence of any intention to seek an unfair advantage or to defraud another party; an honest and sincere intention to fulfill one's obligations in the conduct or transaction concerned.

**Hazardous substance -** A substance defined as a hazardous substance pursuant to CERCLA 42 USC § 9601(14), as interpreted by USEPA regulations and the courts: "(A) any substance designated pursuant to section 1321(b)(2)(A) of Title 33, (B) any element, compound, mixture, solution, or substance designated pursuant to section 9602 of this title, (C) any hazardous waste having the characteristics identified under or listed pursuant to section 3001 Resource Conservation and



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Recovery Act of 1976 (RCRA), as amended (42 USC § 6921) (but not including any waste the regulation of which under the Solid Waste Disposal Act (42 USC § 6901 *et seq.*) has been suspended by Act of Congress), (D) any toxic pollutant listed under section 1317(a) of Title 33, (E) any hazardous air pollutant listed under section 112 of the Clean Air Act (42 USC § 7412), and (F) any imminently hazardous chemical substance or mixture with respect to which the Administrator of the USEPA has taken action pursuant to section 2606 of Title 15. The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas)."

**Hazardous waste -** any hazardous waste having the characteristics identified under or listed pursuant to section 3001 RCRA, as amended (42 USC § 6921) (but not including any waste the regulation of which under RCRA (42 USC § 6901-6992k) has been suspended by Act of Congress). RCRA defines a hazardous waste, at 42 USC § 6903, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may—(A) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed."

**Hazardous waste/contaminated sites -** sites on which a release has occurred, or is suspected to have occurred, of any *hazardous substance, hazardous waste, or petroleum products*, and that release or suspected release has been reported to a government entity.

**Historical Recognized Environmental Condition (HREC) –** a past release of any *hazardous substances* or *petroleum products* that has occurred in connection with the *property* and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the *property* to any required controls (for example, property use restrictions, AULs, institutional controls, or engineering controls). Before calling the past release a *historical recognized environmental condition*, the environmental professional must determine whether the past release is a *recognized environmental condition* at the time the Phase I *Environmental Site Assessment* is conducted (for example, if there has been a change in the regulatory criteria). If the EP considers the past release to be a *recognized environmental condition* at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a *recognized environmental condition*.

**Institutional Controls/Engineering Controls (IC/EC) registries –** databases of institutional controls or engineering controls that may be maintained by a federal state or local environmental agency for purposes of tracking sites that may contain residual contamination and AULs. The names for these may vary from program to program and state to state and include terms such as Declaration of Environmental Use Restriction database (Arizona), list of “deed restrictions” (California), environmental real covenants list (Colorado), and Brownfields site list (Indiana, Missouri) and the Pennsylvania AUL (PA AUL) Registry.

**Innocent landowner defense –**42 USC § 9601(35) and § 9607(b)(3). A person may qualify as one of three types of innocent landowners: (i) a person who “did not know and had no reason to know” that contamination existed on the property at the time the purchaser acquired the property; (ii) a government entity which acquired the property by escheat, or through any other involuntary transfer or acquisition, or through the exercise of eminent domain authority by purchase or condemnation; and (iii) a person who “acquired the facility by inheritance or bequest.” To qualify for the innocent landowner defense, such person must have made all appropriate inquiries on or before the date of



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purchase. Furthermore, all appropriate inquiry must not have resulted in knowledge of the contamination. If it does, then such person did "know" or "had reason to know" of contamination and would not be eligible for the innocent landowner defense. See Appendix XI of ASTM Standard E 152713 for the other necessary requirements that are beyond the scope of the ESA

**Institutional controls (IC) –** a legal or administrative restriction (for example, "deed restrictions," restrictive covenants, easements, or zoning) on the use of, or access to, a site or facility to (1) reduce or eliminate potential exposure to hazardous substances or petroleum products in the soil or ground water on the property, or (2) to prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. An institutional control is a type of AUL.

**Interviews -** those portions contained in Sections 10 and 11 of ASTM Standard E 1527 that are contained in Sections 10 and 11 thereof and address questions to be asked of past and present owners, operators, and occupants of the *property* and questions to be asked of local government officials.

**Key site manager -** the person identified by the owner or operator of a *property* as having good knowledge of the uses and physical characteristics of the property.

**Landfill -** a place, location, tract of land, area or premises used for the disposal of solid wastes as defined by state solid waste regulations. The term is synonymous with the term *solid waste disposal site* and is also known as a garbage dump, trash dump, or similar term.

**Landowner Liability Protections (LLPs) –** landowner liability protections under CERCLA; these protections include the bona fide prospective purchaser liability protection, contiguous property owner liability protection, and innocent landowner defense from CERCLA liability. See 42 USC § 9601(35)(A), 9601(40), 9607(b), 9607(q), 9607(r).

**Local government agencies –** those agencies of municipal or county government having jurisdiction over the *property*. Municipal and county government agencies include but are not limited to cities, parishes, townships, and similar entities.

**Local street directories -** directories published by private (or sometimes government) sources that show ownership, occupancy, and/or use of sites by reference to street addresses.

**Leaking Underground Storage Tanks (LUST) sites -** state lists of leaking underground storage tank sites. RCRA gives USEPA and states, under cooperative agreements with USEPA, authority to clean up releases from UST systems or require owners and operators to do so.

**Major occupants -** those tenants, subtenants, or other persons or entities each of which uses at least 40 percent of the leasable area of the *property* or any anchor tenant when the *property* is a shopping center.

**Material safety data sheet (MSDS) -** written or printed material concerning a *hazardous substance* which is prepared by chemical manufacturers, importers, and employers for hazardous chemicals pursuant to Occupational Safety and Health Administration's (OSHA's) Hazard Communication Standard, 29 CFR 1910.1200.

**Material Threat -** a physically observable or obvious threat which is reasonably likely to lead to a release that, in the opinion of the environmental professional, is threatening and might result in impact to public health or the environment.

**Migrate/migration –** for the purposes of this practice, "migrate" and "migration" refers to the movement of *hazardous substances* or *petroleum products* in any form, including, for example, solid and liquid at the surface or subsurface, and vapor in the subsurface. Note: Vapor migration in the



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subsurface is described in Guide E2600; however, nothing in this practice should be construed to require application of Guide E2600 standard to achieve compliance with all appropriate inquiries.

**National Contingency Plan (NCP) -** the National Oil and Hazardous Substances Pollution Contingency Plan, found at 40 CFR § 300, that is the USEPA's blueprint on how hazardous substances are to be cleaned up pursuant to CERCLA.

**National Priorities List (NPL) -** list compiled by USEPA pursuant to CERCLA 42 USC § 9605(a)(8)(B) of properties with the highest priority for cleanup pursuant to USEPA's Hazard Ranking System. See 40 CFR Part 300.

**Obvious -** that which is plain or evident; a condition or fact that could not be ignored or overlooked by a reasonable observer while *visually or physically observing the property.*

**Occupants -** those tenants, subtenants, or other persons or entities using the *property* or a portion of the property.

**Operator –** *t*he person responsible for the overall operation of a facility.

**Other historical sources -** any source or sources other than those designated in 8.3.4.1 through 8.3.4.8 that are credible to a reasonable person and that identify past uses of the property. The term includes, but is not limited to: miscellaneous maps, newspaper archives, internet sites, community organizations, local libraries, historical societies, current owners or occupants of neighboring properties, and records in the files and/or personal knowledge of the *property owner* and/or occupants.

**Owner -** generally the fee owner of record of the property.

**Petroleum exclusion -** the exclusion from CERCLA liability provided in 42 USC § 9601(14), as interpreted by the courts and USEPA: "The term (hazardous substance) does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

**Petroleum products -** those substances included within the meaning of the *petroleum exclusion* to CERCLA, 42 USC § 9601(14), as interpreted by the courts and USEPA, that is: petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under Subparagraphs (A) through (F) of 42 USC § 9601(14), natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas). (The word fraction refers to certain distillates of crude oil, including gasoline, kerosene, diesel oil, jet fuels, and fuel oil, pursuant to *Standard Definitions of Petroleum Statistics.*

**Phase I Environmental Site Assessment -** the process described in ASTM E 1527.

**Physical setting sources -** sources that provide information about the geologic, hydrogeologic, or topographic characteristics of a property.

**Pits, ponds, or lagoons -** man-made or natural depressions in a ground surface that are likely to hold liquids or sludge containing *hazardous substances* or *petroleum products.* The likelihood of such liquids or sludge being present is determined by evidence of factors associated with the pit, pond, or lagoon, including, but not limited to, discolored water, distressed vegetation, or the presence of an obvious wastewater discharge.



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**Practically reviewable** - information that is practically reviewable means that the information is provided by the source in a manner and in a form that, upon examination, yields information relevant to the property without the need for extraordinary analysis of irrelevant data. The form of the information shall be such that the user can review the records for a limited geographic area. Records that cannot be feasibly retrieved by reference to the location of the property or a geographic area in which the property is located are not generally practically reviewable. Most databases of public records are practically reviewable if they can be obtained from the source agency by the county, city, zip code, or other geographic area of the facilities listed in the record system. Records that are sorted, filed, organized, or maintained by the source agency only chronologically are not generally practically reviewable. Listings in publicly available records which do not have adequate address information to be located geographically are not generally considered practically reviewable. For large databases with numerous facility records (such as RCRA hazardous waste generators and registered underground storage tanks), the records are not practically reviewable unless they can be obtained from the source agency in the smaller geographic area of zip codes. Even when information is provided by zip code for some large databases, it is common for an unmanageable number of sites to be identified within a given zip code. In these cases, it is not necessary to review the impact of all of the sites that are likely to be listed in any given zip code because that information would not be practically reviewable. In other words, when so much data is generated that it cannot be feasibly reviewed for its impact on the property, it is not practically reviewable.

**Property** - the real property that is the subject of the environmental site assessment described in ASTM E 1527-13. Real property includes buildings and other fixtures and improvements located on the property and affixed to the land.

**Property tax files** - the files kept for property tax purposes by the local jurisdiction where the property is located and may include records of past ownership, appraisals, maps, sketches, photos, or other information that is reasonably ascertainable and pertaining to the property.

**Publicly available** - information that is publicly available means that the source of the information allows access to the information by anyone upon request.

**RCRA generators** - those persons or entities that generate hazardous wastes, as defined and regulated by RCRA.

**RCRA generators list** - list kept by USEPA of those persons or entities that generate hazardous waste as defined and regulated by RCRA.

**RCRA TSDF** - those facilities on which treatment, storage, and/or disposal of hazardous wastes takes place as defined and regulated by RCRA.

**RCRA TSDF list** - list kept by USEPA of those facilities on which treatment, storage, and/or disposal of hazardous wastes takes place as defined and regulated by RCRA.

**Reasonably ascertainable** – information that is (1) *publicly available*, (2) obtainable from its source within a reasonable time and cost constraints, and (3) *practically reviewable.*

**Recognized environmental conditions** - the presence or likely presence of any *hazardous substance* or *petroleum products* in, on, or at a *property:* (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not RECS.

**Recorded land title records** - records of historical fee ownership, which may include leases, land contracts, and AULs on or of the property recorded in the place where land title records are, by law or custom, recorded for the local jurisdiction in which the *property* is located. (Often such records are kept by a municipal or county recorder or clerk.) Such records may be obtained from title companies



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or directly from the local government agency. Information about the title to the property that is recorded in a United States district court or any place other than where land title records are, by law or custom, recorded for the local jurisdiction in which the property is located, are not considered part of recorded land title records.

**Records of emergency release notifications EPCRA (42 § 11004) -** Requires operators of facilities to notify their local emergency planning committee (as defined in EPCRA) and state emergency response commission (as defined in EPCRA) of any release beyond the facility's boundary of any reportable quantity of any extremely hazardous substance. Often the local fire department is the local emergency planning committee. Records of such notifications are "Records of Emergency Release Notifications" (42 USC 11004).

**Records review -** that part that is contained in Section 8 of ASTM E 1527 that addresses which records shall or may be reviewed.

**Release** – a release of any hazardous substance or petroleum product shall have the same meaning as the definition of "release" in CERCLA 42 U.S.C. § 9601(22)). For additional background information, see Legal Appendix (Appendix X1 to X1.1.1) "Releases and Threatened Release."

**Report -** the written report prepared by the environmental professional and constituting part of a "Phase I Environmental Site Assessment," as required by ASTM E 1527.

**Site reconnaissance -** that part of ASTM Standard E 1527 (Section 9) and addresses what should be done in connection with the *site visit.* The site reconnaissance includes, but is not limited to, the *site visit* done in connection with such a Phase I Environmental Site Assessment.

**Site visit -** the visit to the property during which observations are made constituting the site reconnaissance section of the Phase I Environmental Site Assessment in Practice E 1527.

**Site visit -** the visit to the property during which observations are made constituting the site reconnaissance section of the Phase I Environmental Site Assessment in Practice E 1527 and the site visit requirement of the transaction screen process in Practice E 1528.

**Solid waste disposal site -** a place, location, tract of land, area, or premises used for the disposal of solid wastes as defined by state solid waste regulations. The term is synonymous with the term *landfill* and is also known as a garbage dump, trash dump, or similar term.

**Solvent -** a chemical compound that is capable of dissolving another substance and may itself be hazardous substance, used in a number of manufacturing/industrial processes, including but not limited to the manufacture of paints and coatings for industrial and household purposes, equipment cleanup, and surface degreasing in metal fabricating industries.

**Standard environmental record sources -** those records specified in the Records Review Section of the Phase I Environmental Site Assessment of Practice E 1527 (Section 8.2.1).

**Standard historical sources -** those sources of information about the history of uses of property specified in the Records Review Section of the Phase I Environmental Site Assessment of Practice E 1527 (Section 8.3.4).

**Standard physical setting source -** a current USGS 7.5-minute topographic map (if any) showing the area on which the property is located.

**Standard practice -** the activities set forth in Practice E 1527.

**Standard sources -** sources of environmental, physical setting, or historical records specified in Section 8 of the Phase I Environmental Site Assessment Standard of Practice E 1527.



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**State registered USTs -** state lists of underground storage tanks required to be registered under Subtitle I, Section 9002 of RCRA.

**Sump -** a pit, cistern, cesspool, or similar receptacle where liquids drain, collect, or are stored.

**TSDF -** treatment, storage, or disposal facility (*see RCRA TSD facilities*).

**Underground injection –** the emplacement or discharge of fluids into the subsurface by means of a well, improved sinkhole, sewage drain hole, subsurface fluid distribution system or other system, or groundwater point source.

**Underground storage tank (UST) -** any tank, including underground piping connected to the tank, that is or has been used to contain hazardous substances or petroleum products and the volume of which is 10 percent or more beneath the surface of the ground.

**User -** the party seeking to use Practice E 1527 to perform an environmental site assessment of the property. A user may include, without limitation, a purchaser of property, a potential tenant of property, an owner of property, a lender, or a property manager. A user has specific obligations for completing a successful application of this practice outlined in Section 6 of the Phase I Environmental Site Assessment Standard of Practice E 1527.

**USGS 7.5-Minute Topographic Map -** the map (if any) available from or produced by the United States Geological Survey, entitled "USGS 7.5-Minute Topographic Map," and showing the property.

**Visually and/or physically observed -** during a site visit pursuant to Practice E 1527, this term means observations made by vision while walking through a property and the structures located on it and observations made by the sense of smell, particularly observations of noxious or foul odors. The term "walking through" is not meant to imply that disabled persons who cannot physically walk may not conduct a site visit; they may do so by the means at their disposal for moving through the property and the structures located on it.

**Wastewater -** water that (1) is or has been used in an industrial or manufacturing process, (2) conveys or has conveyed sewage, or (3) is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. Wastewater does not include water originating on or passing through or adjacent to a site, such as storm water flows, that has not been used in industrial or manufacturing processes, has not been combined with sewage, or is not directly related to manufacturing, processing, or raw materials storage areas at an industrial plant.

**Zoning/land use records -** those records of the local government in which the property is located indicating the uses permitted by the local government in particular zones within its jurisdiction. The records may consist of maps and/or written records. They are often located in the planning department of a municipality or county.



**Privileged and Confidential**
Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.
SC07360_Gem Hill Phase I ESA_Rev1.docx

# Appendix C: User Questionnaire



Privileged and Confidential
Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.

Brown AND Caldwell

# ESA USER QUESTIONNAIRE

**Site/Project Name:** Gem Hill

**Location:** 4.3 Miles north of West Rosamond Blvd. on Tropico Rd, Rosamond, CA 93560

In order to qualify for one of the *Landowner Liability Protections (LLPs)*[1] offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the *"Brownfields Amendments"*),[2] the *user* must provide the following information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that *"all appropriate inquiry"* is not complete. Please explain your answers if appropriate.

1. **Environmental cleanup liens that are filed or recorded against the site (40 CFR 312.25).**

   Are you aware of any environmental cleanup liens against the *property* that are filed or recorded under federal, tribal, state or local law?

   Yes _____ No __v__

2. **Activity and land use limitations that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).**

   Are you aware of any AULs, such as *engineering controls*, land use restrictions or *institutional controls* that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law?

   Yes _____ No __v__

3. **Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).**

   As the *user* of this *ESA* do you have any specialized knowledge or experience related to the *property* or nearby properties? For example, are you involved in the same line of business as the current or former *occupants* of the *property* or an adjoining *property* so that you would have specialized knowledge of the chemicals and processes used by this type of business?

   Yes _____ No ___v__

[1] *Landowner Liability Protections, or LLPs,* is the term used to describe the three types of potential defenses to Superfund liability in EPA's *Interim Guidance Regarding Criteria Landowners Must Meet in Order to Qualify for Bona Fide Prospective Purchaser, Contiguous Property Owner, or Innocent Landowner Limitations on CERCLA Liability ("Common Elements"* Guide) issued on March 6, 2003.

[2] P.L. 107-118.

Brown AND Caldwell

# ESA USER QUESTIONNAIRE

4. **Relationship of the purchase price to the fair market value of the *property* if it were not contaminated (40 CFR 312.29).**

   Does the purchase price being paid for this *property* reasonably reflect the fair market value of the *property*?

   Yes __v__ No _____

   If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the *property*?

   Yes _____ No _____ NA __v___

5. **Commonly known or *reasonably ascertainable* information about the *property* (40 CFR 312.30).**

   Are you aware of commonly known or *reasonably ascertainable* information about the *property* that would help the *environmental professional* to identify conditions indicative of releases or threatened releases?

   Yes __v___ No _____

   For example, as *user*,

   (a) Do you know the past uses of the *property*? Yes __v___ No _____

   (b) Do you know of specific chemicals that are present or once were present at the *property*? Yes _____ No __v___

   (c) Do you know of spills or other chemical releases that have taken place at the *property*? Yes _____ No ___v__

   (d) Do you know of any environmental cleanups that have taken place at the *property*? Yes _____ No __v___

Brown AND Caldwell

# ESA USER QUESTIONNAIRE

6. **The degree of obviousness of the presence or likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).**

   As the user of the *ESA* based on your knowledge and experience related to the *property* are there any obvious indicators that point to the presence or likely presence of contamination at the *property*?

   Yes _____ No ___v__

   **To enable Brown and Caldwell to complete your project, please also respond to the following items.**

   (a) The reason why the Phase I is required:

   *To establish a baseline after purchase.*

   (b) The type of *property* (e.g., industrial, commercial, vacant, agricultural, residential, etc.) and type of *property* transaction, for example, sale, purchase, exchange, etc.:

   *The land is vacant and was recently purchased by CalPortland Company.*

   (c) The complete and correct address for the *property*, including county (a map or other documentation showing *property* location and boundaries is helpful):

   *4.3 Miles north of West Rosamond Blvd. on Tropico Rd, Rosamond, CA 93560*

   (d) The scope of services desired for the Phase I (including whether any parties to the *property* transaction may have a required standard scope of services or whether any considerations beyond the requirements of Practice E 1527 are to be considered):

   *To establish a baseline after purchase.*

   (e) Identification of all parties who will rely on the Phase I *report*:

   *CalPortland Company*

   (f) Identification of the site contact and how the contact can be reached:

Brown AND Caldwell

# ESA USER QUESTIONNAIRE

(g) Any special terms and conditions which must be agreed upon by the *environmental professional*:

*Not applicable.*

(h) Any other knowledge or experience with the *property* that may be pertinent to the *environmental professional* (for example, copies of any available prior *environmental site assessment reports*, documents, correspondence, etc., concerning the *property* and its environmental conditions. These include, but are not necessarily limited to:

- Environment site assessment *reports,*
- Environment compliance audit *reports,*
- Environmental permits (for example, solid waste disposal permits, *hazardous waste* disposal permits, *wastewater* permits, NPDES permits, *underground injection* permits),
- Registrations for underground and above-ground storage tanks,
- Registrations for *underground injection* systems,
- *Material safety data sheets,*
- Community right-to-know plan,
- Safety plans; preparedness and prevention plans; spill prevention, countermeasure, and control plans; etc.,
- *Reports* regarding hydrogeologic conditions on the *property* or surrounding area,
- Notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the *property* or relating to *environmental liens* encumbering the *property*,
- *Hazardous waste* generator notices or *reports,*
- Geotechnical studies,
- Risk assessments, and
- Recorded AULs.

- *The grading permit and construction SWPPP are attached.*
- *The Pozzolan Safety Data Sheet can be found at:* Pozzolan_SDS_US_040820_FINAL.pdf (netdna-ssl.com)

(i) *Proceedings Involving the Property* – whether the User knows of:

(a) Any pending, threatened, or past litigation relevant to *hazardous substances* or *petroleum products* in, on, or from the *property*;

Yes _____ No __v___

Brown AND Caldwell

# ESA USER QUESTIONNAIRE

(b) Any pending, threatened, or past administrative proceedings relevant to *hazardous substances* or *petroleum products* in, on, or from the *property*;

Yes _____ No __v___

(c) Any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to *hazardous substances* or *petroleum products*;

Yes _____ No __v___

Please explain any "Yes" answers below.

**Completed by:**

| | |
|---|---|
| Signature |  |
| Printed Name | Alison Brewer |
| Organization | CalPortland Company |
| Date | January 18, 2021 |

Please return this questionnaire to:

Angela Brush
abrush@brwncald.com
Brown and Caldwell
fax – 303-239-5454
phone – 303-239-5463

# ROSAMOND □ILLS PROPERT□ CO□NT□ OF □ERN CALIFORNIA

# □RADIN□ PLAN

## CAL PORTLAND COMPAN□

## PARCEL NO. 3□□-03□-0□

### GRADING NOTES:

1. ALL GRADING SHALL CONFORM WITH CHAPTER 33 OF THE CALIFORNIA BUILDING CODE AND STANDARDS.
2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED BY KERN COUNTY BUILDING DEPARTMENT.
3. THE ENGINEER HAS SHOWN EXISTING UNDERGROUND LINES ON THIS PLAN TO THE BEST OF HIS KNOWLEDGE. THERE MAY BE OTHER LINES IN THE GROUND. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LINES IN THE FIELD PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT / U.S.A. NORTH 811 (1-800-642-2444) FOR UTILITY LOCATION AT LEAST 48 (BUSINESS) HOURS PRIOR TO ANY EXCAVATION OR TRENCHING.
4. THE CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD HARMLESS THE OWNER AND THE ENGINEER FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.
5. ALL EXISTING IMPROVEMENTS THAT ARE REMOVED, DAMAGED, OR UNDERCUT SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE CITY ENGINEER, AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE COUNTY'S BUILDING OFFICIAL AT LEAST 48 (BUSINESS) HOURS PRIOR TO THE PLACING OF ANY FILL MATERIAL.
7. COMPACTION TESTS SHALL BE PROVIDED BY THE CONTRACTOR AT LOCATIONS TO BE DETERMINED BY THE COUNTY'S INSPECTORS.
8. FILL MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE SOILS ENGINEER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING OF PAD AREA TO WITHIN ± 0.1'. IF ELEVATION OF DESIGN ELEVATION PAD SHOULD BE FOUND TO BE MORE THAN ± 0.1' OFF OF DESIGN ELEVATION AFTER COMPLETION AND ACCEPTANCE OF GRADING, THE CONTRACTOR SHALL RETURN AND CORRECT THE GRADING AT NO COST TO THE OWNER.
10. THE CONTRACTOR SHALL TERRACE ALL PADS WHEN ELEVATION DIFFERENCE BETWEEN PADS IS GREATER THAN 0.3', UNLESS OTHERWISE SHOWN.
11. ALL AREAS ON THE SITE ON WHICH STRUCTURES ARE TO BE PLACED MUST BE COMPACTED TO 90% DENSITY, FOR A MINIMUM DISTANCE OF 5' IN ALL DIRECTIONS FROM THE FOUNDATIONS OF THE STRUCTURE.
12. ALL FILL SHALL CONFORM TO THE REQUIREMENTS FOR "ENGINEERED FILL" AS DESCRIBED IN THE PRELIMINARY SOILS REPORT, IF PROVIDED.
13. FILL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING SIX (6) INCHES IN COMPACTED THICKNESS AND COMPACTED AT OPTIMUM MOISTURE CONTENT BY AN APPROVED METHOD.
14. THE DESIGN ENGINEER SHALL EXERCISE SUFFICIENT SUPERVISORY CONTROL DURING GRADING AND CONSTRUCTION TO INSURE COMPLIANCE WITH THE PLANS, SPECIFICATIONS, AND CODE WITHIN HIS PURVIEW.
15. COMPACTION IN PROPOSED PAVEMENT AREAS SHOULD BE TO A MINIMUM OF 95% OF THE MAXIMUM DENSITY AS OBTAINED BY A.S.T.M. TEST METHOD D1557-78, METHOD A, AND SHOULD EXTEND TO A MINIMUM DISTANCE OF 2' BEYOND THE OUTSIDE EDGES OF PAVEMENTS.
16. UPON COMPLETION OF GRADING AND BEFORE THE START OF CONSTRUCTION, A FINAL SOILS REPORT COVERING THE SITE PREPARATION AND GRADING SHALL BE SUBMITTED BY THE SOILS ENGINEER.
17. ALL CUT SLOPES SHALL NOT BE STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL.
18. ALL FILL SLOPES SHALL NOT BE STEEPER THAN 2 HORIZONTAL TO 1 VERTICAL.
19. ALL FILL AREAS SHALL BE CLEARED OF ALL VEGETATION AND OTHER MATERIAL UNSUITABLE FOR A STRUCTURAL FILL, AND THE AREA SCARIFIED TO A DEPTH OF 12".
20. ALL SLOPES IN EXCESS OF 3' IN VERTICAL HEIGHT SHALL BE PREPARED AND MAINTAINED TO CONTROL AGAINST EROSION.
21. SURFACE DRAINAGE SHALL BE 1% MINIMUM, EXCEPT AS WAIVED BY A BUILDING OFFICIAL.
22. GRADING WORK WILL BE SUPERVISED AS ENGINEERED GRADING IN ACCORDANCE WITH CHAPTER 33 OF THE CALIFORNIA BUILDING CODE.
23. ALL CUT AND FILL SLOPES GREATER THAN 3.0' HIGH SHALL BE HYDRAULICALLY PLANTED (HYDROSEEDED) IN A UNIFORM MANNER. THE TYPE OF SEED SHALL BE APPROVED BY THE COUNTY BUILDING DEPARTMENT.
24. THE SOILS ENGINEER SHALL NOT BE RESPONSIBLE OR LIABLE FOR UNAUTHORIZED CHANGES TO, OR USES OF, THESE PLANS. ALL CHANGES TO THESE PLANS MUST BE APPROVED IN WRITING BY THE SOILS ENGINEER.
25. DUST CONTROL:
    IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PREVENT A DUST NUISANCE FROM ORIGINATING FROM THE WORK SITE AS A RESULT OF HIS OPERATIONS DURING THE EFFECTIVE PERIOD OF THIS CONTRACT. PREVENTATIVE MEASURES TO BE TAKEN BY THE CONTRACTOR SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
    A. WATER SHALL BE APPLIED TO ALL UNPAVED AREAS AS REQUIRED TO PREVENT THE SURFACES FROM BECOMING DRY ENOUGH TO PERMIT DUST FORMATION.
    B. PAVED SURFACES OVER WHICH VEHICULAR TRAFFIC IS PERMITTED TO TRAVEL SHALL BE KEPT FREE OF DIRT.
26. DURING GRADING, REASONABLE SEARCHING SHALL BE PERFORMED FOR CONCEALED SUBSURFACE OBSTRUCTIONS. ALL ABANDONED SUBSURFACE OBSTRUCTIONS SHALL BE REMOVED. IF THE TERMINUS OF ANY ABANDONED PIPING IS OUTSIDE THE PROJECT LIMITS, THE PIPING SHOULD BE REMOVED WITHIN THE PROJECT AND PROPERLY CAPPED AT THE PROJECT BOUNDARY.
27. THE STAKING AND MARKING OF THE PROJECT SHALL BE DONE ONLY ONCE BY THE OWNER, AND ALL RESTAKING OR REMARKING SHALL BE AT THE EXPENSE OF THE CONTRACTOR.
28. THE CUT AND FILL QUANTITIES ARE CALCULATED USING A COMPACTION FACTOR OF 1.2. THE ENGINEER MAKES NO WARRANTY, EITHER DIRECT OR IMPLIED, THAT THIS WILL BE THE ACTUAL COMPACTION FACTOR. IF A DEFICIENCY OR AN EXCESS OF SOIL OCCURS, THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER, WHO SHALL DETERMINE IF ADJUSTMENTS CAN BE MADE TO IMPROVE THE BALANCE BETWEEN CUT AND FILL.
29. THE CUT AND FILL QUANTITIES SHOWN ON THIS PLAN ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL, AFTER EXAMINING THE PLAN, SOILS REPORT (IF PROVIDED), AND THE SITE TERRAIN, PREPARE HIS BID PRICE FOR THE PROJECT BASED ON HIS OWN ANALYSIS OF THE WORK REQUIRED.
30. PAD ELEVATIONS SHOWN ARE FOR ROUGH GRADING. AFTER COMPLETION OF BUILDINGS, ALL LOTS SHALL BE FINE GRADED TO SLOPE TO THE STREETS OR DESIGNED DRAINAGE OUTLETS WITH A MINIMUM GRADE OF 1%.
31. THE SOILS ENGINEER MUST APPROVE ALL SOIL COMPACTION, INCLUDING THE STABILITY OF ALL SLOPES, BOTH THOSE THAT ARE CREATED BY AND THOSE REMAINING AFTER GRADING OPERATIONS.
32. THE ENGINEER MAY FURNISH REFERENCE LINES AND GRADE STAKES AT THE BEGINNING OF THE WORK TO ESTABLISH ALIGNMENT AND GRADE. ANY GRADE STAKES OR REFERENCE POINTS WHICH MAY BE LOST OR DESTROYED BY THE CONTRACTOR DURING THE PROGRESS OF HIS WORK SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. THE ENGINEER MAY REQUIRE FIELD CHECKS AT ANY STAGE OF THE WORK. THE COST OF THESE FIELD CHECKS SHALL BE BORNE BY THE OWNER. THE CONTRACTOR'S RESPONSIBILITY FOR THIS SECTION WILL NOT APPLY IN THE CASE OF MALICIOUS DAMAGE BY OTHERS.
33. IF THE CONTRACTOR IS IN DOUBT AS TO THE MEANING OF ANY PART OF THE PLAN AND SPECIFICATIONS OR FINDS DISCREPANCIES IN OR OMISSIONS FROM THE DRAWING OR SPECIFICATIONS, HE SHALL SUBMIT A WRITTEN REQUEST FOR AN INTERPRETATION OR A CORRECTION THEREOF, PRIOR TO FILING HIS BID FOR THE PROJECT.
34. THE ENGINEER IS NOT CONTRACTED WITH THE OWNER TO PROVIDE SLOPE STAKING. IF THE CONTRACTOR WANTS THE ENGINEER TO PROVIDE SLOPE STAKING, HE SHALL HIRE THE ENGINEER TO PERFORM THIS SERVICE AT THE CONTRACTOR'S EXPENSE.
35. ENGINEERED FILL SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PRELIMINARY SOILS REPORT, IF PROVIDED, AND MUST BE COMPACTED TO 90% MAXIMUM RELATIVE DENSITY AS DETERMINED BY APPROVED METHOD PER SECTION 3305 OF THE CURRENT CALIFORNIA BUILDING CODE AND CERTIFIED BY TESTS AND REPORT FROM THE SOILS ENGINEER.
36. THE CONTRACTOR IS RESPONSIBLE TO CALL UNDERGROUND SERVICE ALERT / U.S.A. NORTH 811 (1-800-642-2444) FOR UTILITY LOCATION AT LEAST 48 (BUSINESS) HOURS PRIOR TO BEGINNING ANY WORK ON THE PROJECT.

### PLANNING NOTES:

IF DURING CONSTRUCTION ACTIVITIES OR GROUND DISTURBANCE CULTURAL RESOURCES ARE UNCOVERED, THE SUBDIVIDER SHALL STOP WORK AND RETAIN A QUALIFIED ARCHEOLOGIST FOR FURTHER STUDY. THE SUBDIVIDER SHALL NOTIFY THE PROPER AUTHORITIES AND BE SUBJECT TO ANY MITIGATION MEASURES REQUIRED OF THE ARCHEOLOGIST.

### GENERAL NOTES:

IF THE PROJECT IS SUBJECT TO THE PROVISIONS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES), A "NOTICE OF INTENT" (NOI) TO COMPLY WITH THE TERMS OF THE GENERAL PERMIT TO DISCHARGE STORM WATER ASSOCIATED WITH CONSTRUCTION ACTIVITY (WQ ORDER NO. 92-08-DWQ) MUST BE FILED WITH THE STATE WATER RESOURCES CONTROL BOARD IN SACRAMENTO BEFORE THE BEGINNING OF ANY CONSTRUCTION ACTIVITY. COMPLIANCE WITH THE GENERAL PERMIT REQUIRES THAT A STORM WATER POLLUTION PREVENT PLAN (SWPPP) BE PREPARED, CONTINUOUSLY CARRIED OUT, AND ALWAYS BE AVAILABLE FOR PUBLIC INSPECTION DURING NORMAL CONSTRUCTION HOURS.

### SITE SPECIFIC NOTES:

- GRADING PLAN BOUNDARY MARKED ON MAP (30.69 ACRES)
- FILL PAD AT PROPERTY ENTRY (7,225 CUBIC YARDS COMPACTED TO 90%) FILL SLOPE 3:1 H:V.
- GATE LOCATION (30-FOOT-WIDE GATE).
- 1 TON BOULDER PLACEMENT NORTH AND SOUTH OF GATE AT PROPERTY BOUNDARY.
- PLATFORM PAD (DOME CUT) DESIGN FOR 39,643 CUBIC YARDS CUT (USE – 12-INCH GRIZZLY FOR MATERIAL TO PAD FILL) MAXIMUM CUT SLOPE 2:1 H: V. 32,418 CUBIC YARDS TO BE HAULED OFF PROPERTY FOR DISPOSAL. DOME CUT IS FROM THE 2700 TO THE 2680 ELEVATION (20-FOOT CUT). DOME IS TO BE TERRACED, DRILLED AND BLASTED WITH SOME RIPPING TO THE 2680 BY CPC AND SUBCONTRACTOR. A MATERIAL LOADING/GRIZZLY PLATFORM IS DESIGNED AT THE 2680 ELEVATION LOCATED NORTH OF DOME CUT FOR LOAD AND GRIZZLY BY CPC.
- DOME ACCESS ROAD (30-FOOT WIDTH) WITH CUT AND FILL SLOPE MAXIMUM OF 2:1 H:V.
- LOW WATER DRAINAGE CROSSING BETWEEN FILL PAD AND DOME CUT.
- RIP RAP BARRIER AT LOW WATER CROSSING.
- ACCESS ROAD ALONG PROPERTY ROAD TO STORM WATER MONITOR STATION (20 FEET WIDE, WITH 1-TON BOULDER PLACEMENT ON BOUNDARY, TO BE SUPPLIED BY CPC).
- ALTERNATIVE NORTH ACCESS ROAD TO DOME LOADING AREA (25 FEET WIDE) WITH 2:1 CUT AND FILL SLOPES AS REQUIRED. INCLUDE DESIGN AND CUT AND FILL VOLUMES WITH APPLICATION. ROAD GRADIENT NOT TO EXCEED 10% GRADE.
- DRAINAGE FROM ROADS, PADS AND ALL STRUCTURES MUST BE CONTAINED WITH GRADING PLAN BOUNDARY AND DISCHARGE OFF THE PROPERTY AT THE DESIGNATED STORM WATER SAMPLE LOCATION (LOCATED ON PROPERTY BOUNDARY TO THE SOUTHEAST OF THE FILL PAD).
- PLACEMENT OF WATTLES – DETAILED ON DRAWING – TO BE INCLUDED IN STORM WATER PLAN TO BE PREPARED BY CPC.
- ADJUST GRADING BOUNDARY IF NECESSARY WITHIN THE CPC PROPERTY BOUNDARY WHICH IS MARKED ON THE MAP.

### ESTIMATED EARTHWORK QUANTITIES:

CUT 39643 C.Y. FILL 7225 C.Y. NET 32418 C.Y. CUT

NOTE:

THE CUT AND FILL QUANTITIES SHOWN ON THIS PLAN ARE FOR PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL, AFTER EXAMINING THE PLAN, SOILS REPORT (IF PROVIDED), AND THE SITE TERRAIN, PREPARE HIS ESTIMATED EARTHWORK INDEPENDENTLY OF THE ENGINEER'S.

### ACREAGE

30.69 ACRES

### LEGAL DESCRIPTION

EAST ½ OF THE NW QUARTER OF SECTION 36, T.10 N, R.13 W, S.B.M.
PARCEL # 345-032-02

### U.S.A. NOTE:

THE CONTRACTOR IS RESPONSIBLE TO CALL UNDERGROUND SERVICE ALERT / U.S.A. NORTH 811 (1-800-642-2444) PRIOR TO BEGINNING ANY WORK ON THE PROJECT.

### PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THIS MAP.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THIS DRAWING.

THE ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA.

THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT / U.S.A. NORTH 811 (1-800-642-2444) FOR UTILITY LOCATION AT LEAST 48 (BUSINESS) HOURS PRIOR TO CONSTRUCTION.

### SHEET INDEX

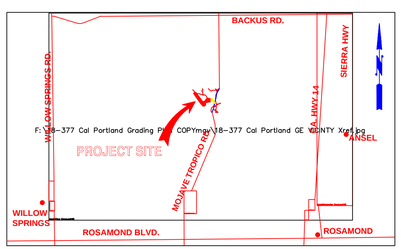
GP1 GRADING PLAN

### ENGINEER'S STATEMENT

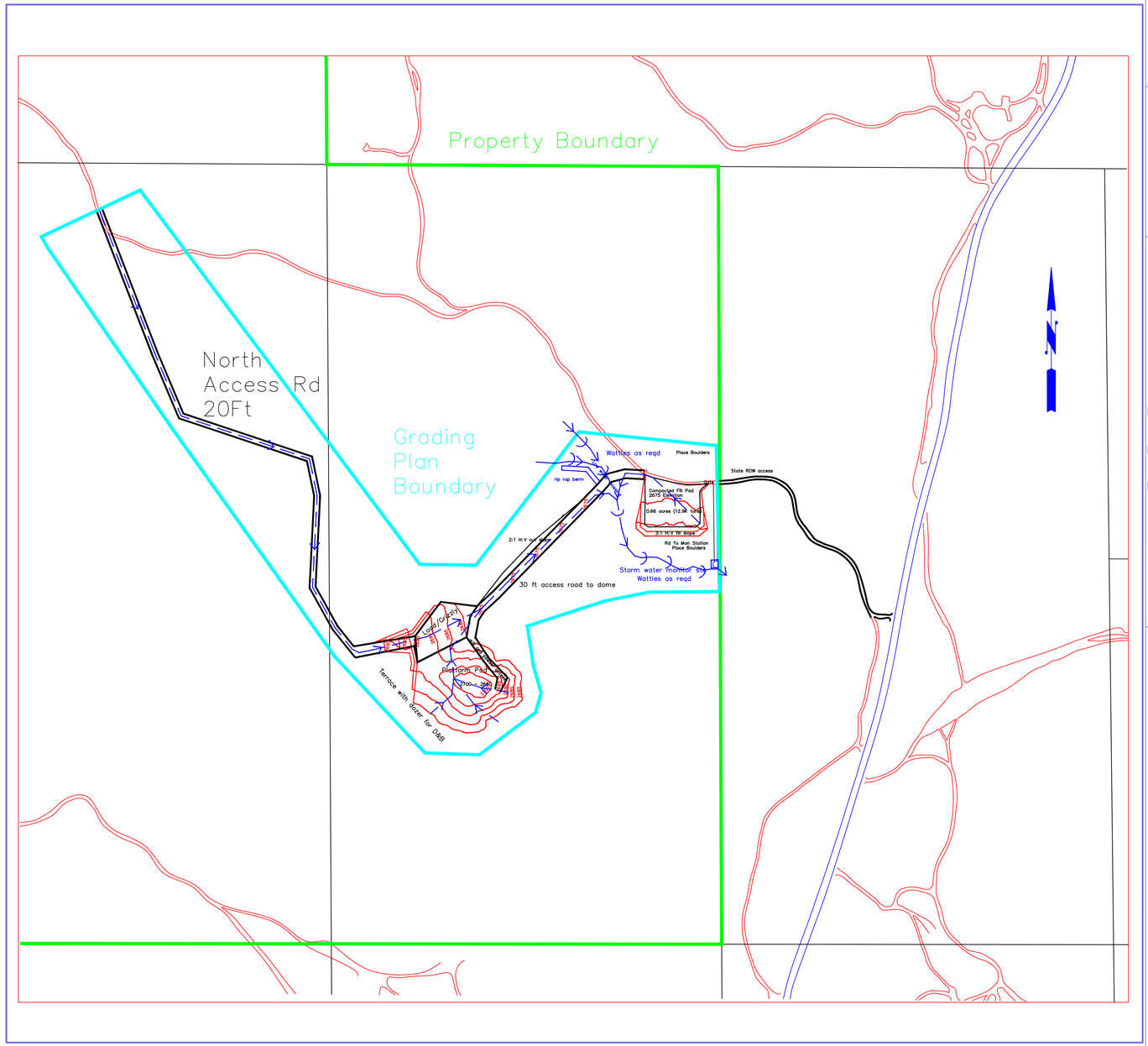
THESE PLANS AND SPECIFICATIONS WERE PREPARED BY ME OR UNDER MY DIRECTION, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH CITY OF BAKERSFIELD ORDINANCES, STANDARDS, AND DESIGN CRITERIA, AND INCLUDE ALL IMPROVEMENT REQUIREMENTS OF THE ADVISORY AGENCY OR OTHER REVIEW BOARD.

ANY ERRORS, OMISSIONS, OR OTHER VIOLATIONS OF THOSE ORDINANCES, STANDARDS, OR DESIGN CRITERIA ENCOUNTERED DURING CONSTRUCTION SHALL BE CORRECTED AND SUCH CORRECTIONS REFLECTED ON CORRECTED PLANS SUBMITTED TO THE CITY ENGINEER.

L.THOMAS BAYNE R.C.E. 26106 EXP. 3/31/20 DATE




VICINIT□ MAP N.T.S.




REVISION HISTORY

| REV | DESCRIPTION | DATE | APPROVED BY |
|---|---|---|---|

L. THOMAS BAYNE No. 26106 Exp. 3/31/20 REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

SEI
4400 YEAGER WAY
BAKERSFIELD, CA 93313
661.831.5100 FAX: 661.831.2111
www.soilsengineering.com

GRADING PLAN
FOR CAL PORTLAND COMPANY
ROSAMOND HILLS PROPERTY
APN: 345-032-02
ROSAMOND, KERN COUNTY, CALIFORNIA
SECTION 36, T. 10N., R. 13 W., M.D.M.

| SIZE | REV.0-07. | DRAWING NUMBER | REVISION | mgv |
|---|---|---|---|---|
| D | 08.01.2018 | 18-377 – GP01 | 0 | |
| SCALE | N.T.S. | SHEET 1 OF 1 | | |

# *Office Memorandum ~ Kern County*

TO: BID

DATE: May 29, 2019

FROM: John George

APN: 345-031-02

PERMIT: K2018-06271

ZONE: A

In accordance with Section 19.12.020.A of the Kern County Zoning Ordinance, approval is given for the grading of access roads and pads for security and future development, per the approved site plan. Please note, all future development will require zoning approval and consultation with the Kern County Planning and Natural Resources Department per the submitted operations statement.

MICROFILM

# STORM WATER POLLUTION PREVENTION PLAN

**for**

## CalPortland Gem Hill Grading Project
## Rosamond, CA

**RISK LEVEL 1**

**WDID #: 6B15C384488**

**Legally Responsible Person (LRP):**

Warren Burchett
CalPortland Company
9350 Oak Creek Rd.
Mojave, California 93501

**Project Address:**

Gem Hill (west of Mojave Tropico Road, between Dawn Road and Gayiety Avenue)
Rosamond Hill Property
Rosamond, Kern County, California
APN: 345-032-02

**SWPPP Prepared by:**

Sespe Consulting, Inc.
374 Poli Street, Suite 200
Ventura, California 93001
A. Pearce Swerdfeger (QSD)

**SWPPP Preparation Date**

June 5, 2019

**Estimated Project Dates:**

| | | | |
|---|---|---|---|
| Start of Construction | **June 24, 2019** | Completion of Construction | **December 31, 2019** |

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## Qualified SWPPP Developer

Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: *CalPortland Gem Hill Grading Project*

Project Number / ID: *CA04.14.05*

"This Storm Water Pollution Prevention Plan and Attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

| | |
|---|---|
| QSD Signature | 07/29/2019<br>Date |
| *A. Pearce Swerdfeger, PE*<br>QSD Name | *C87466*<br>QSD Certificate Number |
| *Project Manager, Sespe Consulting, Inc.*<br>Title and Affiliation | *(805) 275-1515*<br>Telephone Number |
| *PSwerdfeger@SespeConsulting.com*<br>Email | |

## Legally Responsible Person

Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: *CalPortland Gem Hill Grading Project*

Project Number / ID: *CA04.14.05*

"I certify under penalty of law that this document and all Attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."



Signature of Legally Responsible Person or Approved Signatory

8/1/19

Date

*Warren Burchett*

Name of Legally Responsible Person or Approved Signatory

*(626) 823-3765*

Telephone Number

## Amendment Log

Project Name: *CalPortland Gem Hill Grading Project*

Project Number / ID: *CA04.14.05*

| Amendment No. | Date | Brief Description of Amendment, include section and page number | Prepared and Approved By |
|---|---|---|---|
| Original Plan | August 29, 2018 | Original Plan | Name: A. Pearce Swerdfeger<br>QSD# C87466 |
| 1 | June 5, 2019 | Updating Construction Timeline and Contractors | Name: A. Pearce Swerdfeger<br>QSD# C87466 |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |
| | | | Name:<br>QSD# |

# Section 1 SWPPP Requirements

## 1.1 INTRODUCTION

The CalPortland Gem Hill Grading Project construction site comprises approximately 30.69 acres is located across APNs: 345-032-02, 345-032-05, 345-032-31 near the City of Rosamond, in Kern County. The Project site is located immediately west of Mojave Tropico Road between Dawn Road and Gayiety Avenue. The site location is shown on the Site Map in Appendix B.

This Storm Water Pollution Prevention Plan (SWPPP) is designed to comply with California's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit or CGP) Order No. 2009-0009-DWQ as amended by Order No. 2010-0014-DWQ and Order No. 2012-0006-DWQ [NPDES No. CAS000002]) issued by the State Water Resources Control Board (State Water Board). This SWPPP has been prepared following the SWPPP Template provided on the California Storm Water Quality Association *Stormwater Best Management Practice Handbook Portal: Construction* (CASQA, 2012). In accordance with the CGP, Section XIV, this SWPPP is designed to address the following:

- Pollutants and their sources, including sources of sediment associated with construction, construction site erosion and other activities associated with construction activity are controlled;
- Where not otherwise required to be under a Regional Water Quality Control Board (Regional Water Board) permit, all non-storm water discharges are identified and either eliminated, controlled, or treated; and
- Site Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the Best Available Technology / Best Control Technology (BAT / BCT) standard.

## 1.2 PERMIT REGISTRATION DOCUMENTS

Required Permit Registration Documents (PRDs) shall be submitted to the State Water Board via the Storm Water Multi Application and Report Tracking System (SMARTS) by the Legally Responsible Person (LRP), or authorized personnel (i.e., Approved Signatory [AS]) under the direction of the LRP. The project-specific PRDs include:

1. Notice of Intent (NOI);
2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination);
3. Site Map;
4. Annual Fee;
5. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal); and
6. SWPPP.

Site Maps can be found in Appendix B. A copy of the submitted PRDs shall also be kept in Appendix C along with the Waste Discharge Identification (WDID) confirmation.

## 1.3 SWPPP AVAILABILITY AND IMPLEMENTATION

The discharger shall make the SWPPP available at the construction site during working hours (see Section 7.5 of the Construction Site Monitoring Program [CSMP] for working hours) while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not at the construction site, current copies of the BMPs and map / drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio / telephone (CGP Section XIV, Part C).

The SWPPP shall be implemented concurrently with the start of ground disturbing activities.

## 1.4 SWPPP AMENDMENTS

The SWPPP should be revised:

- If there is a CGP violation;
- When there is a reduction or increase in total acreage disturbed by construction activities covered in this SWPPP (CGP, Section II, Part C); or
- If BMPs do not meet the objectives of reducing or eliminating pollutants in storm water discharges.

Additionally, the SWPPP shall be amended:

- When there is a change in construction or operations which may affect the discharge of pollutants to surface waters, groundwater(s), or a municipal separate storm sewer system (MS4);
- When there is a change in the project duration that changes the project's risk level; or
- When deemed necessary by the Qualified SWPPP Developer (QSD). The QSD has determined that the changes listed in Table 1.1, below, can be field determined by the Qualified SWPPP Practitioner (QSP). Changes not in these categories shall be made by the QSD as formal amendments to the SWPPP.

The following items shall be included in each amendment:

- Party requesting the amendment;
- The location of proposed change;
- The reason for change;
- The original BMP proposed, if any; and
- The new BMP proposed.

Amendments shall be logged at the front of the SWPPP and certification kept in Appendix D. The SWPPP text shall be revised, replaced, and / or hand annotated as necessary to properly convey the amendment. In general, SWPPP amendments must be made by a QSD. However, the following changes have been designated by the QSD as "to be field determined" and constitute minor changes that the QSP may implement based on field conditions.

**Table 1.1 List of Changes to be Field Determined**

| Candidate changes for field location or determination by QSP[1] | Check changes that can be field located or field determined by QSP |
|---|---|
| Increase quantity of an erosion or sediment control measure | X |
| Relocate / add stockpiles or stored materials | X |
| Relocate or add toilets | X |
| Relocate vehicle storage and / or fueling locations | X |
| Relocate areas for waste storage | X |
| Relocate water storage and / or water transfer location | X |
| Changes to access points (entrance / exits) | X |
| Change type of erosion or sediment control measure | X |
| Changes to location of erosion or sediment control | X |
| Minor changes to schedule or phases | X |
| Changes in construction materials | X |
| Changes in contractor / subcontractor information | X |
| *(1) Any field changes not identified for field location or field determination by QSP must be approved by QSD.* | |

## 1.5 RETENTION OF RECORDS

Paper or electronic records of documents required by this SWPPP shall be retained for a minimum of three years from the date generated or date submitted, whichever is later. This includes the following items:

- Notice of Intent (NOI);
- Site Maps;
- Signed Certification Statement;
- SWPPP;
- Project drawings;
- All inspection records;
- All sampling records and lab analyses;
- Rain gauge readings;
- Quality Assurance / Quality Control Reports;
- Records of any corrective actions taken;
- Notice of Termination (NOT); and
- The CGP.

These records shall be available at the site until construction is complete. Records assisting in the determination of compliance with the CGP shall be made available within a reasonable time, to the Regional Water Board, State Water Board, or U.S. Environmental Protection Agency

(EPA) upon request. Requests by the Regional Water Board for retention of records for a period longer than three years shall be adhered to.

## 1.6 REQUIRED NON-COMPLIANCE REPORTING

If a discharge violation occurs, the QSP shall immediately notify the LRP and the LRP or AS shall file a violation report electronically to the Regional Water Board within 10 days of identification of non-compliance using SMARTS. Corrective measures will be implemented immediately following the discharge or receipt of written notice of non-compliance from the Regional Water Board.

The report to the LRP / AS and to the Regional Water Board will contain the following items:

- The date, time, location, nature of operation and type of unauthorized discharge;
- The cause or nature of the notice or order;
- The control measures (BMPs) deployed before the discharge event, or prior to receiving notice or order; and
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

## 1.7 ANNUAL REPORT

The CGP requires that permittees prepare, certify, and electronically submit an Annual Report no later than September 1st of each year. Reporting requirements are identified in Section XVI of the CGP (see Appendix N). Annual reports will be filed in SMARTS and in accordance with information required by the on-line forms.

## 1.8 CHANGES TO PERMIT COVERAGE

The CGP allows for the reduction or increase of the total acreage covered under the CGP when (1) a portion of the project is complete and / or conditions for termination of coverage have been met; (2) ownership of a portion of the project is purchased by a different entity; or (3) new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in acreage covered by the permit is sought. The SWPPP shall be modified appropriately, shall be documented in the Amendment Log at the front of the SWPPP, and certification of SWPPP amendments are to be kept in Appendix D. Updated PRDs submitted electronically via SMARTS are to be maintained in Appendix E.

## 1.9 NOTICE OF TERMINATION

A Notice of Termination (NOT) must be submitted electronically by the LRP via SMARTS to terminate coverage under the CGP. The NOT must include a final Site Map and representative photographs of the project site that demonstrate final stabilization has been achieved. The NOT shall be submitted within 90 days of completion of construction. The Regional Water Board will consider a construction site complete when the conditions of the CGP, Section II.D have been met.

# Section 2 Project Information

## 2.1 PROJECT AND SITE DESCRIPTION

### 2.1.1 Site Description

The CalPortland Gem Hill Grading Project construction site comprises approximately 30.69 acres is located across APNs: 345-032-02, 345-032-05, 345-032-31 near the City of Rosamond, in Kern County. The Project site is located immediately west of Mojave Tropico Road near the intersection of Mojave Tropico Road and Dawn Road and is bound by Gem Hill to the west, the Gem Hill ridgeline to the north, and Mojave Tropico Road to the east. The project is located at Latitude 34.917331° and Longitude -118.219410° and is identified on the Site Map in Appendix B.

The property consists of a total of 403.42 acres (APN 345-032-31 [81.03 acres], APN 345-032-05 [322.39 acres], and APN 345-032-02 [76.74 acres]); however, construction activities covered by this SWPPP will occur on approximately 30.69 acres. Approximately 6.06 acres of soil disturbance is anticipated from grading activities.

### 2.1.2 Existing Conditions

The site is currently an undeveloped hillside with natural vegetation. Minor surface grading has been performed in the past for access roads. As the site is located on a hillslope of Gem Hill, surrounding land uses are primarily undeveloped open space; Mojave Tropico Road is to the east and the City of Rosamond to the southeast.

### 2.1.3 Existing Drainage

The project site is generally sloped from the northwest towards the southeast. According to GoogleEarth, elevations at the site range from approximately 2,880 to 2,660 feet above mean sea level (msl). Because much of the site is sloped, small storm flows generally flow downslope. Larger storm flows collect in unnamed ephemeral drainages adjacent to the Project area, which generally flow from north to south towards the City of Rosamond. An unnamed ephemeral drainage, which conveys storm water flows from northwest of the project site crosses through the site south of the proposed compacted fill pad. Storm flows are ephemeral in nature and likely percolate to the ground before reaching the City of Rosamond. Storm water discharges from the site are considered direct discharges, as defined by the State Water Board.

The project area discharges to an unnamed ephemeral drainage that is not listed for water quality impairment on the most recent 303(d)-list. Existing site topography, drainage patterns, and storm water conveyance systems are shown on the figures presented in Appendix B.

### 2.1.4 Geology and Groundwater

The site is underlain primarily by granitic rock outcrop and gravelly loamy sands. The gravelly loamy sands are comprised of alluvium derived from granite, and are excessively drained; the saturated hydraulic conductivity of the soil is high. The depth to groundwater is greater than 80 inches (NRCS Web Soil Survey). The complete USDA NRCS soil resource report is included in Appendix P.

### 2.1.5 Project Description

The CalPortland Gem Hill Grading Project includes the grading of two site pads and site access roads. The eastern pad will be a compacted fill pad and the western pad will be a cut pad in hard rock. New roads constructed include a 30-foot wide access road between the two pads and a 20-foot wide northern access road from the western pad to an existing road to the northwest.

Grading will include both cut and fill activities; with the total graded material is estimated to be 46,868 cubic yards. Approximately 7,225 cubic yards of cut material will be used as fill material during grading activities. Construction activities will be generally completed in a single phase.

Project grading will occur on approximately 6.06 acres, which comprises approximately 20% of the grading plan boundary shown on the Grading Plans (Soils Engineering, Inc.). The limits of grading are shown on the figures in Appendix B.

### 2.1.6 Developed Condition

Post construction surface drainage from the access roads and western pad will be directed to the southeast as sheet flow and will discharge to an existing, unnamed ephemeral drainage channel in the southeast corner of the site. The eastern pad will slow to the northwest and discharge to the same drainage channel.

Post construction drainage patterns and conveyance systems are presented on the figures in Appendix B.

**Table 2.1 Construction Site Estimates**

| Project Element | Area (approximate) |
|---|---|
| Total Property Size | 403.42 acres |
| Grading Plan Boundary | 30.69 acres |
| Construction Site Areas (disturbed area) | 6.06 acres |
| Percent impervious before construction | 0% |
| Percent impervious after construction | 0% |

## 2.2 PERMITS AND GOVERNING DOCUMENTS

In addition to the CGP, the following documents have been taken into account while preparing this SWPPP:

- Grading Plan (Thomas Bayne, Soils Engineering, Inc., 08/01/2018)
- Custom Soil Resource Report for Kern County, California, Southeastern Part, CalPortland Gem Hill Project, United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)
- CASQA, Stormwater BMP Handbook Portal: Construction, July 2012

## 2.3 STORM WATER RUN-ON FROM OFF-SITE AREAS

The area surrounding the project site is sloped and naturally drains to nearby water bodies. Storm water run-on to the project area is not anticipated. In the event that storm water does run onto the site, it will likely be from the immediately adjacent, undeveloped areas and significant impacts to storm water quality is not anticipated.

## 2.4 FINDINGS OF THE CONSTRUCTION SITE SEDIMENT AND RECEIVING WATER RISK DETERMINATION

A construction site risk assessment has been performed for the project and the resultant risk level is Risk Level 1.

The risk level was determined through the use of:

- R factor guidance developed by the US EPA https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites
- K Factor GIS Maps for Google Earth developed by the State Water Board. ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk (K Factor)
- LS Factor GIS Maps for Google Earth developed by the State Water Board. ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk (LS Factor)

The risk level is based on project duration, location, proximity to impaired receiving waters and soil conditions. A copy of the Risk Level determination submitted to SMARTS with the PRDs is included in Appendix C.

Table 2.2 summarizes the sediment and receiving water risk factors and document the sources of information used to derive the factors.

**Table 2.2 Summary of Sediment Risk**

| RUSLE Factor | Value | Method for establishing value |
|---|---|---|
| R | 6.39 | Rainfall Erosivity Factor Calculator (https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites) |
| K | 0.15 | K Factor Google Earth GIS Map (ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/) |
| LS | 0.74 | LS Factor Google Earth GIS Map (ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/) |
| **Total Predicted Sediment Loss** | | **1.01121 tons / acre** |
| **Overall Sediment Risk**<br>Low Sediment Risk: < 15 tons / acre<br>Medium Sediment Risk: >/= 15 and < 75 tons / acre<br>High Sediment Risk: >/= 75 tons / acre | | ☒ **Low**<br>☐ **Medium**<br>☐ **High** |
| **Overall Receiving Water Risk** | | ☒ **Low**<br>☐ **High** |

Based on the GIS map for Google Earth provided by the State Water Resources Control Board, the receiving water risk for the project site is low.

The CalPortland Gem Hill Grading Project disturbance areas subject to this SWPPP are Risk Level 1. Risk Level 1 sites are subject to the narrative effluent limitations specified in the CGP. The narrative effluent limitations require storm water discharges associated with construction activity to minimize or prevent pollutants in storm water and authorized non-storm water through the use of controls, structures, and BMPs. This SWPPP has been prepared to address Risk Level 1 requirements (CGP Attachment C).

## 2.5 CONSTRUCTION SCHEDULE

Construction activities are expected to last from June 24, 2019 (start of ground disturbance) to December 31, 2019. Modification or extension of the schedule (start and end dates) beyond these dates may affect risk determination and CGP requirements. The LRP shall contact the QSD if the schedule changes during construction to address potential impact to the SWPPP. The estimated schedule for planned work can be found in Appendix F.

## 2.6 POTENTIAL CONSTRUCTION ACTIVITY AND POLLUTANT SOURCES

Appendix G includes a list of construction activities and associated materials that are anticipated to be used on-site. These activities and associated materials have the potential to contribute pollutants, other than sediment, to storm water runoff.

The anticipated activities and associated pollutants were used to select the BMPs for the project (Section 3). The location of anticipated pollutants and associated BMPs are shown on the Figures presented in Appendix B.

Sampling requirements for non-visible pollutants associated with construction activity can be found in Section 7.7.1. For a full and complete list of on-site pollutants, refer to the Safety Data Sheets (SDS), which will be maintained at the project site.

## 2.7 IDENTIFICATION OF NON-STORM WATER DISCHARGES

Non-storm water discharges consist of discharges that do not originate from precipitation events. The CGP provides allowances for specified non-storm water discharges that do not cause erosion or carry other pollutants.

Non-storm water discharges into storm drainage systems or waterways, which are not authorized under the CGP and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

Non-storm water discharges that are **authorized** from this project site include the following:

- Water used to control dust. Water used to control dust will be applied in a manner that limits the amount of runoff as much as possible;
- Potable water;
- Uncontaminated air conditioning or compressor condensate;
- Landscape irrigation.

These authorized non-storm water discharges will be managed with the storm water and non-storm water BMPs described in Section 3 of this SWPPP and will be minimized by the QSP.

Activities at this site that have the potential to result in **unauthorized** non-storm water discharges include:

- Vehicle and equipment cleaning, fueling, and maintenance operations;
- Vehicle and equipment wash water;
- Sanitary and septic wastes; and
- Chemical leaks and / or spills of any kind including but not limited to petroleum, paints, cure compounds, etc.

Steps will be taken, including the implementation of appropriate BMPs, to ensure that unauthorized discharges are eliminated, controlled, disposed, or treated on-site.

## 2.8 REQUIRED SITE MAP INFORMATION

Appendix B includes maps showing the project vicinity and site location, surface water boundaries, geographic features, and construction disturbance areas subject to this SWPPP.

# Section 3 Best Management Practices

## 3.1 SCHEDULE FOR BMP IMPLEMENTATION

| BMP* | Implementation | Duration | Inspection Frequency |
|---|---|---|---|
| EC1 – Scheduling | October 2018 | Construction Period | Weekly** |
| EC2 – Preservation of Existing Vegetation | October 2018 | Construction Period | Weekly** |
| EC3 – Hydraulic Mulch | October 2018 | Construction Period | Weekly** |
| EC4 – Hydroseed | October 2018 | Construction Period | Weekly** |
| EC5 – Soil Binders | October 2018 | Construction Period | Weekly** |
| EC6 – Straw Mulch | October 2018 | Construction Period | Weekly** |
| EC7 – Geotextiles and Mats | October 2018 | Construction Period | Weekly** |
| EC10 – Velocity Dissipation Devices | October 2018 | Construction Period | Weekly** |
| EC15 – Soil Preparation-Roughening | October 2018 | Construction Period | Weekly** |
| EC16 – Non-Vegetated Stabilization | October 2018 | Construction Period | Weekly** |
| WE1 – Wind Erosion Control | October 2018 | Construction Period | Weekly** |
| SE1 – Silt Fence | October 2018 | Construction Period | Weekly** |
| SE4 – Check Dams | October 2018 | Construction Period | Weekly** |
| SE5 – Fiber Rolls | October 2018 | Construction Period | Weekly** |
| SE6 – Gravel Bag Berm | October 2018 | Construction Period | Weekly** |
| SE7 – Street Sweeping | October 2018 | Construction Period | Weekly** |
| SE8 – Sand Bag Barrier | October 2018 | Construction Period | Weekly** |
| SE12 – Manufactured Linear Sediment Control | October 2018 | Construction Period | Weekly** |
| TC1 – Stabilized Construction Entrance / Exit | October 2018 | Construction Period | Weekly ** |
| TC2 – Stabilized Construction Roadway | October 2018 | Construction Period | Weekly ** |
| NS1 – Water Conservation Practices | October 2018 | Construction Period | Weekly** |
| NS4 – Temporary Stream Crossing | October 2018 | Construction Period | Weekly** |
| NS6 – Illicit Discharges | October 2018 | Construction Period | Weekly** |
| NS7 – Potable Water / Irrigation | October 2018 | Construction Period | Weekly** |
| NS8 – Vehicle and Equipment Cleaning | October 2018 | Construction Period | Weekly** |
| NS9 – Vehicle and Equipment Fueling | October 2018 | Construction Period | Weekly** |
| NS10 – Vehicle and Equipment Maintenance | October 2018 | Construction Period | Weekly** |
| WM1 – Material Delivery and Storage | October 2018 | Construction Period | Weekly** |
| WM2 – Material Use | October 2018 | Construction Period | Weekly** |
| WM3 – Stockpile Management | October 2018 | Construction Period | Weekly** |
| WM4 – Spill Prevention and Control | October 2018 | Construction Period | Weekly** |

| BMP* | Implementation | Duration | Inspection Frequency |
|---|---|---|---|
| WM5 – Solid Waste Management | October 2018 | Construction Period | Weekly** |
| WM6 – Hazardous Waste Management | October 2018 | Construction Period | Weekly** |
| WM8 – Concrete Waste Management | October 2018 | Construction Period | Weekly** |
| WM9 – Sanitary / Septic Waste Management | October 2018 | Construction Period | Weekly** |
| WM10 – Liquid Waste Management | October 2018 | Construction Period | Weekly** |

* This list presents all of the BMPs that may potentially be utilized during this Project. These BMPs are not all necessarily ***required*** for this Project. For more detail on which BMPs will be utilized, refer to Tables 3.2 through 3.5.

** BMPs should also be inspected within 48 hours of a 50% or greater chance of rain, every 24 hours during extended storm events, and after a qualifying storm event.

## 3.2 EROSION AND SEDIMENT CONTROL

Erosion and sediment controls are required by the CGP to provide effective reduction or elimination of sediment related pollutants in storm water discharges and authorized non-storm water discharges from the site. Applicable BMPs are identified in this section for erosion control, sediment control, tracking control, and wind erosion control.

### 3.2.1 Erosion Control

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in storm water runoff. Erosion control BMPs protect the soil surface by covering and / or binding soil particles.

The following general practices will be implemented throughout construction areas to provide effective temporary and final erosion control during construction:

1. Preserve existing vegetation where required and when feasible.
2. Control areas of soil disturbance such that erosion control BMPs can be quickly and effectively implemented.
3. Stabilize non-active disturbed areas within 14 days of cessation of construction activities or sooner if stipulated by local requirements.
4. Minimize erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding, or alternate methods in these areas.
5. Apply permanent erosion control to remaining disturbed soil areas prior to the completion of construction.

Sufficient erosion control materials shall be maintained on-site to allow for immediate implementation of BMPs as directed by this SWPPP.

The following temporary erosion control BMP selection table indicates the BMPs that shall be implemented to control erosion within disturbed areas covered by this SWPPP. Fact Sheets for temporary erosion control BMPs are provided in Appendix H.

## ary Erosion Control BMPs

| | Meets a Minimum Requirement[1] | BMP Used? | | If not used, state reason: |
|---|---|---|---|---|
| | | YES | NO | |
| | ✓ | X | | |
| Existing | ✓ | X | | |
| ı | ✓[2] | X | | Use as necessary to stabilize hillsides. |
| | ✓[2] | X | | Use as necessary to stabilize hillsides. |
| | ✓[2] | X | | |
| | ✓[2] | X | | Use as necessary to stabilize hillsides. |
| Mats | ✓[2] | X | | Use as necessary to stabilize hillsides. |
| | ✓[2] | | X | Other methods used. |
| Drainage Swales | ✓[3] | | X | Not necessary for project. |
| tion Devices | | X | | |
| | | | X | Other methods used. |
| abilization | | | X | No streams running through project. |
| ets | ✓[2] | | X | Other methods used. |
| -Roughening | | X | | |
| Stabilization | ✓[2] | X | | Use as necessary to stabilize hillsides. |
| ontrol | ✓ | X | | |
| | | | | **If used, state reason:** |
| | | | | |

project shall be determined by the QSD.
plementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level

l be directed away from all disturbed areas, or shall be collected in compliance with effluent limitations in the CGP.
vill be in accordance with the Grading Plan.

These temporary erosion control BMPs shall be implemented as outlined in the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

The CGP requires that dischargers:

- Implement effective wind erosion control;
- Provide effective soil cover for inactive areas (construction areas that have been disturbed and are not scheduled to be re-disturbed for at least 14 days) and finished slopes, open space, utility backfill, and completed lots; and
- Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

### 3.2.2 Sediment Controls

Sediment controls are temporary or permanent structural measures that are intended to complement the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water.

Due to the sloped nature of the majority of the site prior to construction modification, storm water runoff is primarily in the form of rill flow. The following sediment control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Fact Sheets for temporary sediment control BMPs are provided in Appendix H.

**ry Sediment Control BMPs**

| | Meets a Minimum Requirement[1] | BMP used | | If not used, state reason: |
|---|---|---|---|---|
| | | YES | NO | |
| | ✓(2) (3) | X | | |
| | | | X | Other methods used. May be implemented if determined necessary by the QSP. |
| | | | X | Other methods used. |
| | | X | | |
| | ✓(2)(3) | X | | |
| ı | ✓(3) | X | | |
| | ✓ | X | | As necessary along Mojave Tropico Road. |
| | | X | | |
| er | | | X | Sandbags similar in effect, and avoid litter produced by disintegrating straw bales. |
| t Protection | ✓ RL2&3 | | X | No adjacent storm drains. |
| ıt System (ATS) | | | X | ATS not necessary. |
| near Sediment Control | | X | | |
| ıd Berm | ✓(3) | | X | Other methods used. |
| | ✓(3) | | X | Other methods used. |
| uction Entrance and Exit | ✓ | X | | |
| uction Roadway | | X | | |
| Tire Wash | | | X | Other methods used. May be implemented if determined necessary by the QSP. |
| | | | | **If used, state reason:** |
| | | | | |

project shall be determined by the QSD.
lementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level

de linear sediment control along toe of slope, face of slope, and at the grade breaks of exposed slope.

These temporary sediment control BMPs shall be implemented in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

The CGP requires that dischargers:

- Establish and maintain effective perimeter controls and stabilize construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
- Design sediment basins, if used, according to the method provided in CASQA's Construction BMP Guidance Handbook.
- Implement appropriate erosion control BMPs (runoff control and soil stabilization) in conjunction with sediment control BMPs for areas under active construction.
- Apply linear sediment controls along the toe of a slope, face of a slope, and at the grade breaks of exposed slopes to comply with a sheet length of 20 feet for a slope percentage of 0% to 25%, 15 feet for a slope percentage of 25% to 50%, and 10 feet for a slope percentage of over 50%.
- Ensure that construction activity traffic to and from the project is limited to entrances and exits that employ effective controls to prevent off-site tracking of sediment.
- Ensure that storm drain inlets and perimeter controls, runoff control BMPs, and pollutant controls at entrances and exits (e.g. tire washoff locations) are maintained and protected from activities that reduce their effectiveness.
- Inspect immediate access roads daily. At a minimum daily (when necessary) and prior to any rain event, the discharger shall remove sediment or other construction-related materials that are deposited on the roads (by vacuuming or sweeping).

***Air Deposition Management***

The CGP requires that dischargers implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations.

The Project shall utilize the following good housekeeping measures to control air deposition, as applicable:

- EC-1 Scheduling
- EC-2 Preservation of Existing Vegetation
- EC-3 Hydraulic Mulch
- EC-5 Soil Binders
- EC-7 Geotextiles and Mats
- EC-16 Non-vegetative Stabilization
- WE-1 Wind Erosion Control
- WM-3 Stockpile Management

## 3.3 NON-STORM WATER CONTROLS AND WASTE AND MATERIALS MANAGEMENT

### 3.3.1 Non-Storm Water Controls

Non-storm water discharges into storm drainage systems or waterways, which are not authorized under the CGP, are prohibited. Non-storm water discharges for which a separate NPDES permit is required by the local Regional Water Board are prohibited unless coverage under the separate NPDES permit has been obtained for the discharge. The selection of non-storm water BMPs is based on the list of construction activities with a potential for non-storm water discharges identified in Section 2.7 of this SWPPP.

The following non-storm water control BMP selection table indicates the BMPs that shall be implemented to control sediment on the construction site. Fact Sheets for temporary non-storm water control BMPs are provided in Appendix H.

## rary Non-Storm Water BMPs

| ıme | Meets a Minimum Requirement[1] | BMP Used? | | If not used, state reason: |
|---|---|---|---|---|
| | | YES | NO | |
| Conservation Practices | ✓ | X | | |
| ring Operation | | | X | No dewatering anticipated. |
| and Grinding Operation | | | X | No paving / grinding anticipated. |
| ary Stream Crossing | | X | | |
| ater Diversion | | | X | No water diversion anticipated. |
| nnection- Illegal Discharge tion | ✓ | X | | |
| Water / Irrigation | | X | | |
| and Equipment Cleaning | ✓ | X | | |
| and Equipment Fueling | ✓ | X | | |
| and Equipment Maintenance | ✓ | X | | |
| ving Operation | | | X | No pile driving operations expected. |
| e Curing | | | X | No concrete used. |
| e Finishing | | | X | No concrete used. |
| l and Equipment Use Over | | | X | No material / equipment use over water. |
| ion Removal Adjacent to Water | | | X | No adjacent watercourses. |
| ary Batch Plants | | | X | No temporary batch plant will be used. |
| | | **If used, state reason:** | | |
| | | | | |

ic project shall be determined by the QSD.

Non-storm water BMPs shall be implemented in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

***Non-Storm Water Management***

The CGP requires that dischargers:

- Implement measures to control non-storm water discharges during construction.
- Wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 (storm sewer) drainage systems.
- Clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

***Vehicle Storage and Maintenance***

The following good housekeeping measures for vehicle storage and maintenance will be implemented at the site:

- Prevent oil, grease, or fuel leaks to the ground, storm drains or surface waters.
- Place equipment and vehicles that are to be fueled, maintained, or stored in designated areas fitted with appropriate BMPs.
- Clean up spills and leaks immediately and dispose of spilled material and spill cleanup materials properly.

### 3.3.2 Materials Management and Waste Management

Materials management control practices consist of implementing procedural and structural BMPs for handling, storing and using construction materials to prevent the release of those materials into storm water discharges. The amount and type of construction materials to be utilized at the site will depend upon the type of construction and the length of the construction period. The materials may be used continuously, such as fuel for vehicles and equipment, or the materials may be used for a discrete period, such as soil binders for temporary stabilization.

Waste management consists of implementing procedural and structural BMPs for handling, storing and ensuring proper disposal of wastes to prevent the release of those wastes into storm water discharges.

Materials and waste management pollution control BMPs shall be implemented to minimize storm water contact with construction materials, wastes and service areas; and to prevent materials and wastes from being discharged off-site. The primary mechanisms for storm water contact with construction materials that shall be addressed include:

- Direct contact with precipitation;
- Contact with storm water run-on and runoff;
- Wind dispersion of loose materials;

- Direct discharge to the storm drain system through spills or dumping; and
- Extended contact with some materials and wastes, such as asphalt cold mix and treated wood products, which can leach pollutants into storm water.

A list of construction activities is provided in Appendix G, as discussed in Section 2.6. The following Materials and Waste Management BMP selection table indicates the BMPs that shall be implemented to handle materials and control construction site wastes associated with these construction activities. Fact Sheets for Materials and Waste Management BMPs are provided in Appendix H.

## ıorary Materials Management BMPs

| lame | Meets a Minimum Requirement[1] | BMP used? | | If not used, state reason: |
|---|---|---|---|---|
| | | YES | NO | |
| al Delivery and Storage | ✓ | X | | |
| al Use | ✓ | X | | |
| ile Management | ✓ | X | | |
| evention and Control | ✓ | X | | |
| Vaste Management | ✓ | X | | |
| lous Waste Management | ✓ | X | | |
| ninated Soil ement | | | X | No known areas of soil contamination. |
| te Waste Management | ✓ | X | | |
| y-Septic Waste ement | ✓ | X | | |
| Waste Management | | X | | |
| | | | **If used, state reason:** | |
| | | | | |
| | | | | |
| ific project shall be determined by the QSD. | | | | |

Material management BMPs shall be implemented in conformance with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the Site Map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the Site Map prevail over standard details included in the Site Map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

***Construction Materials Management***

Construction materials management is meant to minimize the potential for construction materials to contaminate discharged storm water. The following construction materials housekeeping measures will be implemented at the site:

- An inventory of the products used and / or expected to be used and the end products that are produced and / or expected to be produced at the site will be maintained. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
- Loose stockpiled construction materials that are not actively being used (i.e., soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.) will be covered and bermed.
- Chemicals will be stored in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
- Construction materials exposure to precipitation will be minimized. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
- BMPs will be implemented to prevent the off-site tracking of loose construction and landscape materials.

***Waste Management***

The following good housekeeping measures for waste management will be implemented at the site:

- Disposal of rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system is prohibited.
- Sanitation facilities (e.g., portable toilets) will be contained to prevent discharges of pollutants to the storm water drainage system or receiving water.
- Sanitation facilities will be inspected regularly for leaks and spills and cleaned or replaced as needed.
- Waste disposal containers will be covered at the end of each business day and during rain events.
- Discharges from waste disposal containers to the storm water drainage system or receiving water will be prevented.

- Stockpiled waste material will be contained and securely protected from wind and rain unless actively being used.
- Procedures that effectively address hazardous and non-hazardous spills will be implemented.
- Equipment and materials for cleanup of spills will be available.
- Spills and leaks will be cleaned up immediately and resulting wastes will be disposed of properly.
- Spill response personnel will be assigned and trained in spill response procedures.
- Concrete washout areas and other washout areas that may contain additional pollutants will be contained so there is no discharge into the underlying soil or onto the surrounding areas. No concrete washout will be used for this project.

***Landscape Material Management***

The following good housekeeping measures for landscape materials will be implemented at the site:

- Stockpiled materials such as mulches and topsoil will be contained when they are not actively being used.
- Fertilizers and other landscape materials will be contained when they are not actively being used.
- The application of any erodible landscape material will be discontinued within 2 days before a forecasted rain event or during periods of precipitation.
- Erodible landscape material will be applied at quantities and application rates according to manufacturer recommendations or based on written specifications by knowledgeable and experienced field personnel.
- Erodible landscape material will be stacked on pallets and covered or stored in enclosed areas when not being used or applied.

***Potential Pollutant Source Management***

The CGP requires that dischargers list potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent storm water pollution. When developing BMPs, dischargers shall do the following:

- Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source at the site.
- Consider the degree to which pollutants may be exposed to and mobilized by contact with storm water.
- Consider the direct and indirect pathways by which pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
- Ensure retention of sampling, visual observation, and inspection records.
- Ensure effectiveness of existing BMPs to reduce or prevent storm water pollution.

## 3.4 POST CONSTRUCTION STORM WATER MANAGEMENT MEASURES

Post-construction BMPs are permanent measures installed during construction, designed to reduce or eliminate pollutant discharges from the site after construction is completed.

This site is located in an area subject to a Phase I or Phase II Municipal Separate Storm Sewer System (MS4) permit approved Storm Water Management Plan. ☐ Yes ☒ No

The following source control post-construction BMP to comply with CGP Section XIII.B and local requirements has been identified for the site:

- Soil stabilization

The post-construction funding and maintenance of this BMP will be provided by the LRP.

# Section 4 BMP Inspection, Maintenance, and Rain Event Action Plans

## 4.1 BMP INSPECTION AND MAINTENANCE

The CGP requires routine weekly inspections of BMPs, along with inspections before, during, and after qualifying rain events (i.e., any event that produces ½ inch or more of precipitation). A BMP inspection checklist must be filled out for inspections and maintained on-site with the SWPPP. The inspection checklist in Appendix I, or the simplified inspection checklist found with the Visual Inspection Field Log sheet in CSMP Attachment 3, can be used to document the inspections. Completed checklists shall be kept on site during construction.

BMPs shall be maintained regularly to ensure proper and effective functionality. If necessary, corrective actions shall be implemented within 72 hours of identified deficiencies and associated amendments to the SWPPP shall be prepared by the QSD.

Specific details for maintenance, inspection, and repair of Construction Site BMPs can be found in the BMP Fact Sheets in Appendix H.

## 4.2 RAIN EVENT ACTION PLANS

Rain Event Action Plans (REAPs) are not required for Risk Level 1 projects.

# Section 5 Training

Appendix L identifies the QSPs for the project. To promote storm water management awareness specific for this project, periodic training of job-site personnel shall be included as part of routine project meetings (e.g. daily / weekly tailgate safety meetings), or task specific trainings as needed.

The QSP shall be responsible for providing this information at the meetings, and subsequently completing the training logs shown in Appendix K, which identify the site-specific storm water topics covered as well as the names of site personnel who attended the meeting. Tasks may be delegated to trained employees by the QSP provided adequate supervision and oversight is provided. Training shall correspond to the specific task delegated including: SWPPP implementation; BMP inspection and maintenance; and record keeping.

Documentation of training activities (formal and informal) is retained in SWPPP Appendix K.

# Section 6 Responsible Parties and Operators

## 6.1 RESPONSIBLE PARTIES

Approved Signatories are listed in Appendix L. If additional Authorized Signatories are assigned in the future, written authorizations from the LRP for these individuals will be provided in Appendix L.

QSPs identified for the project are identified in Appendix L. The QSP shall have primary responsibility and significant authority for the implementation, maintenance and inspection / monitoring of SWPPP requirements. The QSP will be available at all times throughout the duration of the project. Duties of the QSP include, but are not limited to:

- Implementing all elements of the CGP and SWPPP, including but not limited to:
  - Ensuring all BMPs are implemented, inspected, and properly maintained;
  - Performing non-storm water and storm water visual observations and inspections;
  - Performing non-storm water and storm sampling and analysis, as required;
  - Performing routine inspections and observations;
  - Implementing non-storm water management and materials and waste management activities such as: monitoring discharges; general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems; etc.
- Delegating inspections and activities to an appropriately trained employee, while ensuring adequacy and adequate deployment.
- Ensuring elimination of unauthorized discharges.
- Mobilizing crews in order to make immediate repairs to the control measures (QSPs shall be assigned this authority by the LRP).
- Coordinating with the contractor(s) to assure all of the necessary corrections / repairs are made immediately and that the project complies with the SWPPP, the CGP and approved plans at all times.
- Notifying the LRP or Authorized Signatory immediately of off-site discharges or other non-compliance events.

## 6.2 CONTRACTOR LIST

The CGP requires that all contractors, subcontractors, and individuals who will be directed by the QSP be included in the SWPPP. A list of subcontractors that will be used to construct the temporary facilities through the date of excavation can be found below. If more contractors are selected, they will be added to the list below.

| Company | Contact Name | Work Address | Phone Number / Emergency Number | Area of Responsibility |
|---|---|---|---|---|
| Arizona Drilling & Blasting | Brian Verona | 1302 W. Drivers Way Tempe, AZ 85284 | (480) 521-5439 | Grading & Explosives Contractor |
| J & A Ramirez Inc. | Marvin Ramirez | 13047 Heywood St. Victorville, CA 92392 | (760) 987-8150 | Trucking Contractor |
| Soils Engineering, Inc. | Thomas Bayne | 4400 Yeager Way Bakersfield, CA 93313 | (661) 831-5100 | Grading Permit Engineering |
| CalPortland Company | Paul Martin | 2025 E. Financial Way Glendora, CA 91741 | | Overall Project Construction |
| CalPortland Company | Ed Harrison | 2025 E. Financial Way Glendora, CA 91741 | | Surveying/Mine Engineering |
| CalPortland Company | Kendall Mayfield | 2025 E. Financial Way Glendora, CA 91741 | | Geology/ Quality Control |
| CalPortland Company | Desirea Haggard | 2025 E. Financial Way Glendora, CA 91741 | | Environmental Compliance |

# Section 7 Construction Site Monitoring Program

## 7.1 Purpose

This Construction Site Monitoring Program was developed to address the following objectives:

1. To demonstrate that the site is in compliance with the Discharge Prohibitions of the CGP;
2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
3. To determine whether immediate corrective actions, additional BMPs implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges;
4. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

## 7.2 Applicability of Permit Requirements

This project has been determined to be a Risk Level 1 project. The CGP identifies the following types of monitoring as being applicable for a Risk Level 1 project.

- Visual inspections of BMPs;
- Visual monitoring of the site related to qualifying storm events;
- Visual monitoring of the site for non-storm water discharges;
- Sampling and analysis of construction site runoff for non-visible pollutants when applicable; and
- Sampling and analysis of construction site runoff as required by the Regional Water Board when applicable.

## 7.3. Weather and Rain Event Tracking

Visual monitoring and inspection requirements of the CGP are triggered by a qualifying rain event. The CGP defines a qualifying rain event as any event that produces ½ inch or more of precipitation. A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying storm events.

### *7.3.1 Weather Tracking*

The QSP should frequently consult the National Oceanographic and Atmospheric Administration (NOAA) for the weather forecasts. These forecasts can be obtained at http://www.srh.noaa.gov/. Weather reports should be routinely printed and maintained with the SWPPP in CSMP Attachment 1 "Weather Reports" or in a separate binder with SWPPP records.

### *7.3.2 Rain Gauges*

One (1) rain gauge shall be installed on the project site, located in an open area away from obstructions such as trees or overhangs. The rain gauge should be mounted on a post or other suitable structure at a height of 3 to 5 feet with the gauge extending several inches beyond the post. The top of the gauge shall be level. The post will not be located in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc.

The rain gauge(s) shall be read prior to, every 24 hours during, and after rain events. The date and time of each reading should be recorded. Rain gauge readings will be logged in CSMP Attachment 1 "Weather Records" or in a separate binder with SWPPP records. Rain gauge instructions will be followed to obtain accurate measurements.

Once the rain gauge reading has been recorded, accumulated rain shall be emptied and the gauge reset.

## 7.4 Monitoring Locations

Monitoring locations are shown on the Site Maps in Appendix B. Monitoring locations are described in the Sections 7.6 and 7.7.

Whenever changes in the construction site might affect the appropriateness of sampling locations, the sampling locations shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended. Temporary changes that result in a one-time additional sampling location do not require a SWPPP amendment.

## 7.5 Safety and Monitoring Exemptions

This project is not required to collect samples or conduct visual observations (inspections) under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

Scheduled site business hours for construction activities are: 6:00 AM – 6:00 PM Monday through Friday. As necessary, occasional work may be conducted on Saturday.

If monitoring (visual monitoring or sample collection) of the site is unsafe because of the dangerous conditions noted above or other dangerous conditions that could create a risk of injury to personnel, then collection of samples and visual observations are not required and the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be filed in CSMP Attachment 2 "Monitoring Records" or in a separate binder with SWPPP records.

## 7.6 Visual Monitoring

Visual monitoring includes observations and inspections. Inspections of BMPs are required to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Visual observations of the site are required to observe storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources.

Table 7.1 identifies the required frequency of visual observations and inspections. Inspections and observations will be conducted at the locations identified in Section 7.6.5.

**Table 7.1 Summary of Visual Monitoring and Inspections**

| Type of Inspection | Frequency |
|---|---|
| *Routine Inspections* | |
| BMP Inspections | Weekly |
| Non-Storm Water Discharge Observations | Quarterly during daylight hours |
| *Rain Event Triggered Inspections* | |
| Site Inspections Prior to a Qualifying Event | Within 48 hours of a qualifying event [1] |
| BMP Inspections During an Extended Storm Event | Once every 24-hour period of a rain event[1] |
| Site Inspections Following a Qualifying Event | Within 48 hours of a qualifying event[1] |
| [1] Inspections are only required during scheduled site operating hours. Inspections during rain events are required daily regardless of the amount of precipitation. | |

### *7.6.1 Routine Observations and Inspections*

Routine site inspections and visual monitoring are necessary to ensure that the project is in compliance with the requirements of the CGP.

#### *7.6.1.1 Routine BMP Inspections*

Inspections of BMPs are conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

#### *7.6.1.2 Non-Storm Water Discharge Observations*

Each drainage area will be inspected for the presence of or indications of prior unauthorized and authorized non-storm water discharges. Inspections will record:

- Presence or evidence of any non-storm water discharge (authorized or unauthorized);
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

### *7.6.2 Rain-Event Triggered Observations and Inspections*

Visual observations of the site and inspections of BMPs are required prior to a qualifying rain event; following a qualifying rain event, and every 24-hour period during a qualifying rain event.

Pre-rain inspections will be conducted after consulting NOAA and determining that a precipitation event with a 50% or greater probability of precipitation has been predicted.

#### *7.6.2.1 Visual Observations Prior to a Forecasted Qualifying Rain Event*

Within 48 hours prior to a qualifying event a storm water visual monitoring site inspection will include observations of the following locations:

- Storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs to identify if they have been properly implemented; and
- Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.

Consistent with guidance from the State Water Resources Control Board, pre-rain BMP inspections and visual monitoring will be triggered by a NOAA forecast that indicates a probability of precipitation of 50% or more in the project area.

#### *7.6.2.2 BMP Inspections During an Extended Storm Event*

During an extended rain event BMP inspections will be conducted to identify and record:

- BMPs that are properly installed;
- BMPs that need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

If the construction site is not accessible during the rain event, the visual inspections shall be performed at all relevant outfalls, discharge points, downstream locations. The inspections should record any projected maintenance activities.

#### *7.6.2.3 Visual Observations Following a Qualifying Rain Event*

Within 48 hours following a qualifying rain event (½ inches of rain) a storm water visual monitoring site inspection is required to observe:

- Storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs to identify if they have been properly designed, implemented, and effective;
- Need for additional BMPs;
- Storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- Discharge of stored or contained rain water.

### ***7.6.3 Visual Monitoring Procedures***

Visual monitoring shall be conducted by the QSP or staff trained by and under the supervision of the QSP.

Storm water observations shall be documented on the *Visual Inspection Field Log Sheet* (see CSMP Attachment 3 "Example Forms"). BMP inspections shall be documented on the site specific BMP inspection checklist. Any photographs used to document observations will be referenced on the storm water site inspection report and maintained with the Monitoring Records in Attachment 2.

The completed reports will be kept in CSMP Attachment 2 "Monitoring Records."

### *7.6.4 Visual Monitoring Follow-Up and Reporting*

Correction of deficiencies identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed as soon as possible.

If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be initiated within 72 hours of identification and be completed as soon as possible. When design changes to BMPs are required, the SWPPP shall be amended to reflect the changes.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on the *Inspection Field Log Sheet* or *BMP Inspection Report* and shall be submitted to the QSP and shall be kept in CSMP Attachment 2 "Monitoring Records."

Results of visual monitoring must be summarized and reported in the Annual Report.

### *7.6.5 Visual Monitoring Locations*

The inspections and observations identified in Sections 7.6.1 and 7.6.2 will be conducted at the locations identified in this section.

BMP locations, drainage areas, stormwater storage / containment areas, and potential storm water discharge locations are shown on the Site Plans in Appendix B.

## 7.7 Water Quality Sampling and Analysis

### *7.7.1 Sampling and Analysis Plan for Non-Visible Pollutants in Storm Water Runoff Discharges*

This Sampling and Analysis Plan for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in storm water runoff discharges from the project site.

Sampling for non-visible pollutants will be conducted when (1) a breach, leakage, malfunction, or spill is observed; (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

The following construction materials, wastes, or activities, as identified in Appendix G as discussed in Section 2.6, are potential sources of non-visible pollutants to storm water discharges from the project. Storage, use, and operational locations are shown on the Site Maps in Appendix B.

- Sediment;
- Fuels and other equipment fluids (oils, greases, etc.);
- Sanitary wastes;
- Soil amendments, pesticides, herbicides; and
- Metals.

The following existing site features, as identified in Section 2.6, are potential sources of non-visible pollutants to storm water discharges from the project. Locations of existing site features contaminated with non-visible pollutants are shown on the Site Maps in Appendix B.

- None

The following soil amendments have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil and will be used on the project site. Locations of soil amendment application are shown on the Site Maps in Appendix B.

- None

The project is not expected to receive storm water run-on from locations with the potential to contribute non-visible pollutants to storm water discharges from the project. If it is determined that storm water run-on may be impacting discharges from the site, the QSP shall determine appropriate locations to take samples of run-on.

#### *7.7.1.1 Sampling Schedule*

Samples for the potential non-visible pollutant(s) and a sufficiently large unaffected background sample shall be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples shall be collected during the site's scheduled hours and shall be collected regardless of the time of year and phase of the construction.

Collection of discharge samples for non-visible pollutant monitoring will be triggered when any of the following conditions are observed during site inspections conducted prior to or during a rain event.

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents storm water contact and runoff from the storage area.
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- A construction activity, including but not limited to those in Section 2.6, with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours

prior to the rain event, (2) BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- Storm water runoff from an area contaminated by historical usage of the site has been observed to combine with storm water runoff from the site, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

#### *7.7.1.2 Sampling Locations*

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence or use; accessibility for sampling, and personnel safety. Non-visible pollutant sampling locations will be determined by the QSP based on a review of site conditions.

No sampling locations have been identified for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants. If run-on is expected to impact non-visible pollutants, the QSP is responsible for identifying a location to sample run-on.

If a storm water visual monitoring site inspection conducted prior to or during a storm event identifies the presence of a material storage, waste storage, or operations area with spills or the potential for the discharge of non-visible pollutants to surface waters or a storm drain system that is at a location not listed above and has not been identified on the Site Maps, sampling locations will be selected by the QSP using the same rationale as that used to identify planned locations. Non-visible pollutant sampling locations shall be identified by the QSP on the pre-rain event inspection form and / or Rain Event Action Plan prior to a forecasted qualifying rain event.

#### *7.7.1.3 Monitoring Preparation*

Samples on the project site will be collected by the QSP or an appropriately trained staff member.

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site or maintained by the sampling contractor. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include, but are not limited to, clean powder-free nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, resealable storage bags, paper towels, personal rain gear, ice, and *Effluent Sampling Field Log Sheets* and Chain of Custody (CoC) forms, which are provided in CSMP Attachment 3 "Example Forms."

### *7.7.1.4 Analytical Constituents*

Table 7.11 lists the specific sources and types of potential non-visible pollutants on the project site and the water quality indicator constituent(s) for that pollutant.

**Table 7.11 Potential Non-Visible Pollutants and Water Quality Indicator Constituents**

| General Work Activity / Potential Pollutants | Water Quality Indicators of Potential Constituents |
|---|---|
| **Cleaning** | |
| Acids | pH |
| Bleaches | Residual chlorine |
| TSP | Phosphate |
| Solvents | Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs) |
| Detergents | Methylene Blue Active Substances (MBAS) |
| Disinfectants | Product dependent, see label and check with laboratory |
| **Grading / Earthworks** | |
| Gypsum / Lime amendments | pH |
| Contaminated Soil | Constituents specific to known contaminants, check with laboratory |
| **Liquid Waste** | Constituents specific to materials, check with laboratory |
| **Sanitary Waste** Sewer Line Breaks and Portable Toilets (using clear fluid – blue fluid is visible if discharged) | Biological Oxygen Demand (BOD), Total Coliform, Fecal Coliform |
| **Soil Preparation / Amendments / Dust Control** | |
| Polymer / Co-polymers | Total Kjeldahl Nitrogen (TKN), Nitrate ($NO_3$), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen, Sulfate, Nickel (Ni) |
| Lignin Sulfate | Total Dissolved Solids (TDS), alkalinity |
| Psyllium | Chemical Oxygen Demand (COD), TOC |
| Guar / Plant Gums | Chemical Oxygen Demand (COD), TOC, Nickel (Ni) |
| **Solid Waste (leakage)** | Biological Oxygen Demand (BOD) |
| **Vehicle and Equipment Use** | |
| Batteries | Sulfuric Acid, Lead (Pb), pH |
| Motor Oils, Hydraulic Fluids, Brake Fluids, Automatic Transmission Fluids, Lubricating Greases | Oil & Grease |
| Gasoline, Diesel Fuel, WD-40 | Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs) |
| Antifreeze | Ethylene Glycol, Propylene Glycol |

Adapted from *Attachment S, Caltrans SWPPP / WPCP Preparation Manual, February 2003*, and *CASQA Construction BMP Handbook*, 2003.

#### *7.7.1.5 Sample Collection*

Samples of discharge shall be collected in locations identified by the QSP based on observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event.

Grab samples shall be collected and preserved in accordance with the methods identified in Table 7.12, "Sample Collection, Preservation and Analysis for Monitoring Non-Visible Pollutants," provided in Section 7.7.1.6. Only the QSP, or personnel trained in water quality sampling under the direction of the QSP shall collect samples.

Sample collection and handling requirements are described in Section 7.7.7.

#### *7.7.1.6 Sample Analysis*

Samples shall be analyzed using the analytical methods identified in the Table 7.12.

A California state-certified laboratory must be used to analyze non-visible pollutant samples. Some local laboratories that may be used are (other qualified laboratories may be used):

**Calscience Environmental Laboratories**
7440 Lincoln Way
Garden Grove, CA 92841
714-895-5494

**BC Laboratories**
4100 Atlas Court
Bakersfield, CA 93308
661-327-4911

**American Analytics**
9765 Eton Avenue
Chatsworth, CA 91311
818-998-5547

**ection, Preservation and Analysis for Monitoring Non-Visible Pollutants**

| Analytical Method | Minimum Sample Volume | Sample Containers | Sample Preservation | Reporting Limit | Maximum Holding Time |
|---|---|---|---|---|---|
| EPA 8260B | 80 ml | (2) 40 ml VOA | HCl | 1 mg/L | 14 days |
| EPA 625 | 1000 ml | 1 L amber glass | None | 1 mg/L | 7 days |
| EPA 410.4 | 125 ml | 1 L plastic | H2SO4 | 1 mg/L | 28 days |
| SM 5210B | 300 ml | 1 L plastic | None | 2 mg/L | 2 days |
| SM 4500-OG | 250 ml | 500 mL amber glass | None | 1 mg/L | 8 hours |
| EPA 425.1 | 250 ml | 1 L plastic | None | 0.05 mg/L | 2 days |
| EPA 160.1 | 250 ml | 500 ml plastic | None | 10 mg/L | 7 days |
| SM 5310 D | 150 ml | 250 ml glass | H2SO4 | 0.3 mg/L | 28 days |
| EPA 351.2 | 250 ml | 250 ml plastic | H2SO4 | 0.1 mg/L | 28 days |
| EPA 300.0 | 250 ml | 250 ml plastic | None | 0.5 mg/L | 28 days |
| EPA 413.2 | 500 ml | 500 ml amber glass | H2SO4 | 5 mg/L | 28 days |
| SM 4500 Cl-G | 100 ml | 500 ml plastic | None | 0.5 mg/L | 15 minutes |
| EPA 200.8 | 100 ml | 250 ml plastic | HNO3 | Varies | 180 days |

oratory for other parameters not listed above.

#### *7.7.1.7 Data Evaluation and Reporting*

The QSP shall complete an evaluation of the water quality sample analytical results.

Runoff / downgradient results shall be compared with the associated upgradient / unaffected results and any associated run-on results. Should the runoff / downgradient sample show an increased level of the tested analyte relative to the unaffected background sample, which cannot be explained by run-on results, the BMPs, site conditions, and surrounding influences shall be assessed to determine the probable cause for the increase.

As determined by the site and data evaluation, appropriate BMPs shall be repaired or modified to mitigate discharges of non-visible pollutant concentrations. Revisions to the BMPs shall be recorded as an amendment to the SWPPP.

The CGP prohibits the storm water discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4. Non-storm water discharge results that indicate the presence of a hazardous substance in excess of established reportable quantities shall be reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4.

Results of non-visible pollutant monitoring shall be reported in the Annual Report.

### *7.7.2 Sampling and Analysis Plan for pH and Turbidity in Storm Water Runoff Discharges*

Sampling and analysis of runoff for pH and turbidity is not required for Risk Level 1 projects.

### *7.7.3 Additional Monitoring Following an NEL Exceedance*

This project is not subject to NELs.

### *7.7.4 Sampling and Analysis Plan for Non-Storm Water Discharges*

This project is not subject to the non-storm water sampling analysis requirements of the CGP because it is a Risk Level 1 project.

### *7.7.5 Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board*

The Regional Water Board has not specified monitoring for additional pollutants.

### *7.7.6 Training of Sampling Personnel*

Sampling personnel shall be trained to collect, maintain, and ship samples in accordance with the Surface Water Ambient Monitoring program (SWAMP) 2008 Quality Assurance Program Plan (QAPrP). Training records of designated contractor sampling personnel are provided in Appendix K.

### *7.7.7 Sample Collection and Handling*

#### *7.7.7.1 Sample Collection*

Samples shall be collected at the designated sampling locations shown on the Site Maps and listed in the preceding sections. Samples shall be collected, maintained and shipped in accordance with the SWAMP 2008 Quality Assurance Program Plan (QAPrP).

Grab samples shall be collected and preserved in accordance with the methods identified in preceding sections.

To maintain sample integrity and prevent cross-contamination, sample collection personnel shall follow the protocols below.

- Collect samples (for laboratory analysis) only in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves when collecting samples;
- Change gloves whenever something not known to be clean has been touched;
- Change gloves between sites;
- Decontaminate all equipment (e.g., bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water;
- Dispose of wash and rinse water appropriately (i.e., do not discharge to storm drain or receiving water);
- Do not decontaminate laboratory-provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;
- Do not park vehicles in the immediate sample collection area (even non-running vehicles);
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Typically, samples are collected by dipping the collection container in the runoff flow paths and streams as noted below.

1. For small streams and flow paths, simply dip the bottle facing upstream until full.
2. For larger stream that can be safely accessed, collect a sample in the middle of the flow stream by directly dipping the mouth of the bottle. Once again making sure that the opening of the bottle is facing upstream as to avoid any contamination by the sampler.
3. For larger streams that cannot be safely waded, pole-samplers may be needed to safely access the representative flow.
4. Avoid collecting samples from ponded, sluggish or stagnant water.
5. Avoid collecting samples directly downstream from a bridge as the samples can be affected by the bridge structure or runoff from the road surface.

Note, that depending upon the specific analytical test, some containers may contain preservatives. These containers should **never** be dipped into the stream, but filled indirectly from the collection container.

#### *7.7.7.2 Sample Handling*

Turbidity and pH measurements should be conducted immediately when possible.

Samples for laboratory analysis must be handled as follows. Immediately following sample collection:

- Cap sample containers;
- Complete sample container labels;
- Seal containers in a re-sealable storage bag;
- Place sample containers into an ice-chilled cooler;
- Document sample information on the *Effluent Sampling Field Log Sheet*; and
- Complete the CoC.

All samples for laboratory analysis must be maintained between 0 and 6 degrees Celsius during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Place samples to be shipped inside coolers with ice. Make sure the sample bottles are well packaged to prevent breakage and secure cooler lids with packaging tape.

Ship samples that will be laboratory analyzed to the analytical laboratory right away. Hold times are measured from the time the sample is collected to the time the sample is analyzed. The CGP requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory). A California state-certified laboratory must be used. Some local laboratories that may be used are listed in Section 7.7.1.6.

*7.7.7.3 Sample Documentation Procedures*

All original data documented on sample bottle identification labels, the *Effluent Sampling Field Log Sheet*, and CoCs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Effluent Sampling Field Log Sheet.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.

Field Log Sheets: Sampling personnel shall complete the *Effluent Sampling Field Log Sheet* and *Receiving Water Sampling Field Log Sheet* for each sampling event, as appropriate.

Chain of Custody: Sampling personnel shall complete the CoC for each sampling event for which samples are collected for laboratory analysis. The sampler will sign the CoC when the sample(s) is turned over to the testing laboratory or courier.

## 7.8 Active Treatment System Monitoring

An Active Treatment System (ATS) will be deployed on the site?

☐ Yes ☒ No

This project does not require a project specific Sampling and Analysis Plan for an ATS because deployment of an ATS is not planned.

## 7.9 Bioassessment Monitoring

This project is not subject to bioassessment monitoring because it is not a Risk Level 3 project.

## 7.10 Watershed Monitoring Option

This project is not participating in a watershed monitoring option.

## 7.11 Quality Assurance and Quality Control

An effective Quality Assurance and Quality Control (QA / QC) plan shall be implemented as part of the CSMP to ensure that analytical data can be used with confidence. QA / QC procedures to be initiated include the following:

- Field logs;
- Clean sampling techniques;
- CoCs;
- QA / QC Samples; and
- Data verification.

Each of these procedures is discussed in more detail in the following sections.

### *7.11.1 Field Logs*

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). Field measurements for pH and turbidity should also be recorded in the field log. A Visual Inspection Field Log and an Effluent Sampling Field Log Sheet are included in CSMP Attachment 3 "Example Forms."

### *7.11.2 Clean Sampling Techniques*

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 7.7.7, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

### *7.11.3 Chain of Custody*

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples;
- Use of CoC forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

Analytical laboratories usually provide CoC forms to be filled out for sample containers. An example CoC is included in CSMP Attachment 3 "Example Forms."

### *7.11.4 QA / QC Samples*

QA / QC samples provide an indication of the accuracy and precision of the sample collection; sample handling; field measurements; and analytical laboratory methods. The following types of QA / QC will be conducted for this project:

☒ Field Duplicates at a frequency of 5 percent.
(Required for all sampling plans with field measurements or laboratory analysis)

☒ Equipment Blanks at a frequency of 5 percent.
(Only needed if equipment used to collect samples could add the pollutants to sample)

☒ Field Blanks at a frequency of 5 percent.
(Only required if sampling method calls for field blanks)

☐ Travel Blanks at a frequency of 5 percent.
(Required for sampling plans that include VOC laboratory analysis)

#### *7.11.4.1 Field Duplicates*

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

#### *7.11.4.2 Equipment Blanks*

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters are used when sampling metals.

#### *7.11.4.3 Field Blanks*

Field blanks assess potential sample contamination levels that occur during field sampling activities. De-ionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

#### *7.11.4.4 Travel Blanks*

Travel blanks assess the potential for cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. De-ionized water blanks are taken along for the trip and held unopened in the same cooler with the VOC samples.

### *7.11.5 Data Verification*

After results are received from the analytical laboratory, the QSP shall verify the data to ensure that it is complete, accurate, and the appropriate QA / QC requirements were met. Data must be verified as soon as the data reports are received. Data verification shall include:

- Check the CoC and laboratory reports.
  *Make sure all requested analyses were performed and all samples are accounted for in the reports.*
- Check laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Check data for outlier values and follow up with the laboratory.
  *Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP should especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location.*

- Check laboratory QA / QC results.
  *EPA establishes QA / QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP shall evaluate the reported QA / QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA / QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.*
- Check the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate.
  *Sample re-analysis should only be undertaken when it appears that some part of the QA / QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA / QC criteria were not met and confirms this in writing.*

Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:

- Check field logs to make sure all required measurements were completed and appropriately documented;
- Check reported values that appear out of the typical range or inconsistent; Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and
- Review notations of any errors and actions taken to correct the equipment or recording errors.

### 7.12 Records Retention

All records of storm water monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board.

Results of visual monitoring, field measurements, and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

Records are to be kept on-site while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and / or measurements, including precipitation;
- The individual(s) who performed the inspections, sampling, visual observation, and / or field measurements;
- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed the laboratory analyses;
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used;
- Rain gauge readings from site inspections;

- QA / QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records; and
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

# CSMP Attachment 1: Weather Reports

# CSMP Attachment 2: Monitoring Records

# CSMP Attachment 3: Example Forms

| Rain Gauge Log Sheet | | | | |
|---|---|---|---|---|
| Construction Site Name: **CalPortland Gem Hill Grading Project** | | | | |
| WDID#: **6B15C384488** | | | | |
| Date (mm/dd/yy) | Time (24-hr) | Initials | Rainfall Depth (Inches) | Notes: |
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| ***Risk Level 1, 2, 3***<br>***Visual Inspection Field Log Sheet*** | | | | | | |
|---|---|---|---|---|---|---|
| Date and Time of Inspection: | | | | Report Date: | | |
| Inspection Type: | □ Weekly | □ Before predicted rain | □ During rain event | □ Following qualifying rain event | □ Contained storm water release | □ Quarterly non-storm water |
| **Site Information** | | | | | | |
| Construction Site Name: **CalPortland Gem Hill Grading Project** | | | | | | |
| Construction stage and completed activities: | | | | Approximate area of exposed site: | | |
| **Weather and Observations** | | | | | | |
| Date Rain Predicted to Occur: | | | | Predicted % chance of rain: | | |
| Estimate storm beginning: _____ (date and time) | | Estimate storm duration:_____ (hours) | | Estimate time since last storm: _____ (days or hours) | | Rain gauge reading:_ _____ (inches) |
| Observations: | | (If yes identify location.) | | | | |
| Odors | Yes □ | No □ | | | | |
| Floating material | Yes □ | No □ | | | | |
| Suspended Material | Yes □ | No □ | | | | |
| Sheen | Yes □ | No □ | | | | |
| Discolorations | Yes □ | No □ | | | | |
| Turbidity | Yes □ | No □ | | | | |
| **Site Inspections** | | | | | | |
| **Outfalls or BMPs Evaluated** | | | **Deficiencies Noted** | | | |
| (add additional sheets or attached detailed BMP Inspection Checklists) | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Photos Taken: | Yes □ | No □ | Photo Reference IDs: | | | |
| **Corrective Actions Identified (note if SWPPP / REAP change is needed)** | | | | | | |
| | | | | | | |
| **Inspector Information** | | | | | | |
| Inspector Name: | | | | Inspector Title: | | |
| Signature: | | | | Date: | | |

**BMP Inspection Checklist**

| BMP | Deficiencies Noted |
|---|---|
| EC1 – Scheduling | |
| EC2 – Preservation of Existing Vegetation | |
| EC3 – Hydraulic Mulch | |
| EC4 – Hydroseed | |
| EC5 – Soil Binders | |
| EC6 – Straw Mulch | |
| EC7 – Geotextiles and Mats | |
| EC10 – Velocity Dissipation Devices | |
| EC15 – Soil Preparation-Roughening | |
| EC16 – Non-Vegetated Stabilization | |
| WE1 – Wind Erosion Control | |
| SE1 – Silt Fence | |
| SE4 – Check Dams | |
| SE5 – Fiber Rolls | |
| SE6 – Gravel Bag Berm | |
| SE7 – Street Sweeping | |
| SE8 – Sand Bag Barrier | |
| SE12 – Manufactured Linear Sediment Control | |
| TC1 – Stabilized Construction Entrance / Exit | |
| TC2 – Stabilized Construction Roadway | |
| NS1 – Water Conservation Practices | |
| NS4 – Temporary Stream Crossing | |
| NS6 – Illicit Discharges | |
| NS7 – Potable Water / Irrigation | |
| NS8 – Vehicle and Equipment Cleaning | |
| NS9 – Vehicle and Equipment Fueling | |
| NS10 – Vehicle and Equipment Maintenance | |
| WM1 – Material Delivery and Storage | |
| WM2 – Material Use | |
| WM3 – Stockpile Management | |
| WM4 – Spill Prevention and Control | |
| WM5 – Solid Waste Management | |
| WM6 – Hazardous Waste Management | |
| WM8 – Concrete Waste Management | |
| WM9 – Sanitary / Septic Waste Management | |
| WM10 – Liquid Waste Management | |
| WM8 – Concrete Waste Management | |
| WM9 – Sanitary / Septic Waste Management | |
| WM10 – Liquid Waste Management | |

**DATE:** **Lab ID:**

| | | | | | | REQUESTED ANALYSIS | | | | Notes: |
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| **Project Name** | | | | | | | | | | |
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| **ımple Date** | **Sample Time** | **Sample Matrix** | **Container #** | **Container Type** | **Container Pres.** | | | | | |
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| | Date: | | Time: |
| | **RECEIVED BY** | | |
| | Signature: | | |
| | Print: | | |
| | Company: | | |
| | Date: | | Time: |

# Section 8 References

CASQA, *Stormwater BMP Handbook Portal: Construction*, July 2012, www.casqa.org

Custom Soil Resource Report for Kern County, California, Southeastern Part, CalPortland Gem Hill Project, United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)

Grading Plan (Thomas Bayne, Soils Engineering, Inc., 08/01/2018)

State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

State Water Resources Control Board (2010). Order 2010-0014-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

State Water Resources Control Board (2012). Order No. 2012-0006-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

# *Appendix A: Calculations*

# *Appendix B: Site Maps*

# *Appendix C: Permit Registration Documents*

# *Appendix D: SWPPP Amendment Certifications*

**SWPPP Amendment No.** _____

Project Name: _____

Project Number: _____

**Qualified SWPPP Developer's Certification of the**

**Storm Water Pollution Prevention Plan Amendment**

"This Storm Water Pollution Prevention Plan and attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Order No. 2009-009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

| | |
|---|---|
| QSD's Signature | Date |
| QSD Name | QSD Certificate Number |
| Title and Affiliation | Telephone |
| Address | Email |

# *Appendix E: Submitted Changes to PRDs*

## Log of Updated PRDs

The Construction General Permit allows for the reduction or increase of the total acreage covered under the Construction General Permit when a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or when new acreage is added to the project.

Modified PRDs shall be filed electronically within 30 days of a reduction or increase in total disturbed area if a change in permit covered acreage is to be sought. The SWPPP shall be modified appropriately, with revisions and amendments recorded in Appendix C. Updated PRDs submitted electronically via SMARTS can be found in this Appendix.

---

This appendix includes all of the following updated PRDs (check all that apply):

☐ Revised Notice of Intent (NOI);

☐ Revised Site Map;

☐ Revised Risk Assessment;

☐ New landowner's information (name, address, phone number, email address); and

☐ New signed certification statement.

_____
Legally Responsible Person

_____ _____
Signature of Legally Responsible Person or Approved Signatory | Date

_____ _____
Name of Legally Responsible Person or Approved Signatory | Telephone Number

# *Appendix F: Construction Schedule*

## Anticipated Construction Schedule

| Phase | Start Date | End Date |
|---|---|---|
| Project Start | June 24, 2019 | N/A |
| Clearing and Grubbing | June 2019 | August 2019 |
| Grading / Terracing (Drilling and Blasting) | June 2019 | October 2019 |
| Project Completion | N/A | December 31, 2019 |

Table 3.1 presents the BMPs to be used at the site and the estimated start and end dates for each.

# *Appendix G: Construction Activities, Materials Used, and Associated Pollutants*

**Table G.a POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

| General Work Activity / Products With Potential Storm Water Pollutants | Specific Work Activity / Products With Potential Storm Water Pollutants | Pollutant Categories |
|---|---|---|
| Cleaners | • Polishes (metal, ceramic, tile)<br>• Etching agents<br>• Cleaners, ammonia, lye, caustic sodas, bleaching agents and chromate salts | Metals, Synthetic Organics |
| Liquid waste | • Wash waters<br>• Irrigation line testing / flushing | Metals, Synthetic Organics |
| Planting / Vegetation Management | • Vegetation control (pesticides / herbicides)<br>• Planting<br>• Plant maintenance<br>• Vegetation removal | Nutrients, Metals, Synthetic Organics |
| Sanitary waste | • Portable toilets<br>• Disturbance of existing sewer lines. | Nutrients |
| Soil preparation / amendments | • Use of soil additives / amendments | Nutrients |
| Solid waste | • Litter, trash and debris<br>• Vegetation | Gross Pollutants |
| Vehicle and equipment use | • Equipment operation<br>• Equipment maintenance<br>• Equipment washing<br>• Equipment fueling | Oil and Grease |

[1] Synthetic Organics are defined in Table 1.2 of the CASQA *Stormwater BMP Handbook Portal: Construction* as adhesives, cleaners, sealants, solvents, etc. These are generally categorized as Volatile Organic Compounds (VOCs) or Semi-Volatile Organic Compounds (SVOCs).

**Table G.1 Construction Activities and Associated Pollutants**

| Phase | Activity | Associated Materials or Pollutants | Pollutant Category[1] |
|---|---|---|---|
| Grading and Land Development | Sanitary waste | • Portable toilets<br>• Disturbance of existing sewer lines | Nutrients |
| | Solid waste | • Litter, trash and debris<br>• Vegetation | Gross Pollutants |
| | Vehicle and equipment use | • Equipment operation<br>• Equipment maintenance<br>• Equipment washing<br>• Equipment fueling | Oil and Grease |
| Landscaping and Site Stabilization Phase | Liquid waste | • Wash waters<br>• Irrigation line testing / flushing | Metals, Synthetic Organics |
| | Planting / Vegetation Management | • Vegetation control (pesticides / herbicides)<br>• Planting<br>• Plant maintenance<br>• Vegetation removal | Nutrients, Metals, Synthetic Organics |
| | Sanitary waste | • Portable toilets<br>• Disturbance of existing sewer lines. | Nutrients |
| | Soil preparation / amendments | • Use of soil additives / amendments | Nutrients |
| | Solid waste | • Litter, trash and debris<br>• Vegetation | Gross Pollutants |
| | Utility line testing and flushing | • Hydrostatic test water<br>• Pipe flushing | Synthetic Organics |
| | Vehicle and equipment use | • Equipment operation<br>• Equipment maintenance<br>• Equipment washing<br>• Equipment fueling | Oil and Grease |

[1] Categories per CASQA BMP Handbook (i.e., Sediment, Nutrients, Bacteria and Viruses, Oil and Grease, Metals, Synthetic Organics, Pesticides, Gross Pollutants, and Vector Production)

# *Appendix H: CASQA Stormwater BMP Handbook Portal: Construction Fact Sheets*

# *Appendix I: BMP Inspection Form*

## BMP INSPECTION REPORT

| Date and Time of Inspection: | | | Date Report Written: | |
|---|---|---|---|---|
| Inspection Type: (Circle one) | Weekly *Complete Parts I, II, III and VII* | Pre-Storm *Complete Parts I, II, III, IV and VII* | During Rain Event *Complete Parts I, II, III, V, and VII* | Post-Storm *Complete Parts I, II, III, VI and VII* |

### Part I. General Information

#### Site Information

| Construction Site Name: | | | |
|---|---|---|---|
| Construction stage and completed activities: | | | Approximate area of site that is exposed: |
| Photos Taken: (Circle one) | Yes | No | Photo Reference IDs: |

#### Weather

| Estimate storm beginning: (date and time) | Estimate storm duration: (hours) |
|---|---|
| Estimate time since last storm: (days or hours) | Rain gauge reading and location: (in) |

Is a "Qualifying Event" predicted or did one occur (i.e., 0.5" rain with 48-hrs or greater between events)? (Y / N)
If yes, summarize forecast:

**Exemption Documentation (explanation required if inspection could not be conducted).** Visual inspections are not required outside of business hours or during dangerous weather conditions such as flooding or electrical storms.

#### Inspector Information

| Inspector Name: | Inspector Title: |
|---|---|
| Signature: | Date: |

| **Part II. BMP Observations.** Describe deficiencies in Part III. | | | |
|---|---|---|---|
| **Minimum BMPs for Risk Level 1 Sites** | Adequately designed, implemented and effective (yes, no, N/A) | Action Required (yes / no) | Action Implemented (Date) |
| **Good Housekeeping for Construction Materials** | | | |
| Stockpiled construction materials not actively in use are covered and bermed | | | |
| All chemicals are stored in watertight containers with appropriate secondary containment, or in a completely enclosed storage shed | | | |
| Construction materials are minimally exposed to precipitation | | | |
| BMPs preventing the off-site tracking of materials are implemented and properly effective | | | |
| **Good Housekeeping for Waste Management** | | | |
| Wash / rinse water and materials are prevented from being disposed into the storm drain system | | | |
| Portable toilets are contained to prevent discharges of waste | | | |
| Sanitation facilities are clean and with no apparent for leaks and spills | | | |
| Equipment is in place to cover waste disposal containers at the end of business day and during rain events | | | |
| Discharges from waste disposal containers are prevented from discharging to the storm drain system / receiving water | | | |
| Stockpiled waste material is securely protected from wind and rain if not actively in use | | | |
| Procedures are in place for addressing hazardous and non-hazardous spills | | | |
| Appropriate spill response personnel are assigned and trained | | | |
| Equipment and materials for cleanup of spills is available on-site | | | |
| Washout areas (e.g., concrete) are contained appropriately to prevent discharge or infiltration into the underlying soil | | | |
| **Good Housekeeping for Vehicle Storage and Maintenance** | | | |
| Measures are in place to prevent oil, grease, or fuel from leaking into the ground, storm drains, or surface waters | | | |
| All equipment or vehicles are fueled, maintained, and stored in a designated area with appropriate BMPs | | | |
| Vehicle and equipment leaks are cleaned immediately and disposed of properly | | | |

| **Part II. BMP Observations Continued. Describe deficiencies in Part III.** | | | |
|---|---|---|---|
| **Minimum BMPs for Risk Level 1 Sites** | Adequately designed, implemented and effective (yes, no, N/A) | Action Required (yes / no) | Action Implemented (Date) |
| **Good Housekeeping for Landscape Materials** | | | |
| Stockpiled landscape materials such as mulches and topsoil are contained and covered when not actively in use | | | |
| Erodible landscape material has not been applied 2 days before a forecasted rain event or during an event | | | |
| Erodible landscape materials are applied at quantities and rates in accordance with manufacturer recommendations | | | |
| Bagged erodible landscape materials on pallets and covered | | | |
| **Good Housekeeping for Air Deposition of Site Materials** | | | |
| Good housekeeping measures implemented to control the air deposition of site materials and from site operations | | | |
| **Non-Storm Water Management** | | | |
| Non-storm water discharges are properly controlled | | | |
| Vehicles are washed in a manner to prevent non-storm water discharges to surface waters or drainage systems | | | |
| Streets are cleaned in a manner to prevent unauthorized non-storm water discharges to surface waters or drainage systems. | | | |
| **Erosion Controls** | | | |
| Wind erosion controls are effectively implemented | | | |
| Effective soil cover is provided for disturbed areas inactive (i.e., not scheduled to be disturbed for 14 days) as well as finished slopes, open space, utility backfill, and completed lots | | | |
| The use of plastic materials is limited in cases when a more sustainable, environmentally friendly alternative exists. | | | |
| **Sediment Controls** | | | |
| Perimeter controls are established and effective at controlling erosion and sediment discharges from the site | | | |
| Entrances and exits are stabilized to control erosion and sediment discharges from the site | | | |
| Linear sediment control along toe of slope, face of slope an at grade breaks | | | |
| Limit construction activity to and from site to entrances and exits that employ effective controls to prevent off-site tracking | | | |
| Storm drain inlets and perimeter controls, runoff control BMPs and pollutants controls at entrances and exits are maintained and protected from activities the reduce their effectiveness | | | |
| Immediate access roads inspected daily | | | |
| **Run-On and Run-Off Controls** | | | |
| Run-on to the site is effectively managed and directed away from all disturbed areas. | | | |

| Other | | | |
|---|---|---|---|
| Are the project SWPPP and BMP plan up to date, available on-site and being properly implemented? | | | |

| Part III. Descriptions of BMP Deficiencies | | |
|---|---|---|
| **Deficiency** | **Repairs Implemented:**<br>**Note** - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible. | |
| | **Start Date** | **Action** |
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |

| **Part IV. Additional Pre-Storm Observations. Note the presence or absence of floating and suspended materials, sheen, discoloration, turbidity, odors, and source(s) of pollutants(s).** | |
|---|---|
| | Yes, No, N/A |
| Do storm water storage and containment areas have adequate freeboard? If no, complete Part III. | |
| Are drainage areas free of spills, leaks, or uncontrolled pollutant sources? If no, complete Part VII and describe below. | |
| Notes: | |
| Are storm water storage and containment areas free of leaks? If no, complete Parts III and / or VII and describe below. | |
| Notes: | |

| **Part V. Additional During Storm Observations. If BMPs cannot be inspected during inclement weather, list the results of visual inspections at all relevant outfalls, discharge points, and downstream locations. Note odors or visible sheen on the surface of discharges. Complete Part VII (Corrective Actions) as needed.** | |
|---|---|
| Outfall, Discharge Point, or Other Downstream Location | |
| Location | Description |
| Location | Description |
| Location | Description |
| Location | Description |
| Location | Description |
| Location | Description |
| Location | Description |
| Location | Description |

| **Part VI. Additional Post-Storm Observations. Visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event, and observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Complete Part VII (Corrective Actions) as needed.** | |
|---|---|
| **Discharge Location, Storage or Containment Area** | **Visual Observation** |
| | |
| | |
| | |
| | |
| | |

| **Part VII. Additional Corrective Actions Required.** Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Note if SWPPP change is required. | |
|---|---|
| **Required Actions** | **Implementation Date** |
| | |
| | |
| | |

## *Appendix J: Project Specific Rain Event Action Plan Template*

Deleted. This site is not subject to REAP requirements.

# Appendix K: Training Reporting Form

# Trained Contractor Personnel Log

**Storm Water Management Training Log and Documentation**

Project Name: **CalPortland Gem Hill Grading Project – Rosamond**

WDID #: **6B15C384488**

Storm Water Management Topic: (check as appropriate)

☐ Erosion Control ☐ Sediment Control

☐ Wind Erosion Control ☐ Tracking Control

☐ Non-Storm Water Management ☐ Waste Management and Materials Pollution Control

☐ Storm Water Sampling

Specific Training Objective: _____

Location: _____ Date: _____

Instructor: _____ Telephone: _____

Course Length (hours): _____

**Attendee Roster (Attach additional forms if necessary)**

| Name | Company | Phone |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

As needed, add proof of external training (e.g., course completion certificates, credentials for QSP, QSD).

# *Appendix L: Responsible Parties*

# Authorization of Approved Signatories

Project Name: **CalPortland Gem Hill Grading Project – Rosamond**

WDID #: **6B15C384488**

| Name of Personnel | Project Role | Company | Signature | Date |
|---|---|---|---|---|
| Desirea Haggard | Environmental Compliance and QSP | CalPortland Company | | |
| | | | | |
| | | | | |
| | | | | |

LRP's Signature

Date

Warren Burchett, Plant Manager-Mojave Plant

LRP Name and Title

(661) 823-3765

Telephone Number

# Identification of QSP

Project Name: **CalPortland Gem Hill Grading Project – Rosamond**

WDID #: **6B15C384488**

The following are QSPs associated with this project:

| Name of Personnel[1] | Company | Date |
|---|---|---|
| A. Pearce Swerdfeger | Sespe Consulting, Inc. | June 5, 2019 |
| Joseph L. King (alternate) | Sespe Consulting, Inc. | June 5, 2019 |
| Desirea Haggard | CalPortland Company | June 5, 2019 |
| | | |
| | | |
| | | |

(1) If additional QSPs are required on the job site add additional lines and include information here.

# *Appendix M: Contractors and Subcontractors*

## CONTRACTOR / SUBCONTRACTOR LIST

The Construction General Permit requires that all contractors, subcontractors, and individuals who will be directed by the QSP be included in the SWPPP. Below is a list of all such individuals associated with the project at this time.

| Company | Contact Name | Work Address | Phone Number | Area of Responsibility |
|---|---|---|---|---|
| Arizona Drilling & Blasting | Brian Verona | 1302 W. Drivers Way Tempe, AZ 85284 | (480) 521-5439 | Grading & Explosives Contractor |
| J & A Ramirez Inc. | Marvin Ramirez | 13047 Heywood St. Victorville, CA 92392 | (760) 987-8150 | Trucking Contractor |
| Soils Engineering, Inc. | Thomas Bayne | 4400 Yeager Way Bakersfield, CA 93313 | (661) 831-5100 | Grading Permit Engineering |
| CalPortland Company | Paul Martin | 2025 E. Financial Way Glendora, CA 91741 | | Overall Project Construction |
| CalPortland Company | Ed Harrison | 2025 E. Financial Way Glendora, CA 91741 | | Surveying/Mine Engineering |
| CalPortland Company | Kendall Mayfield | 2025 E. Financial Way Glendora, CA 91741 | | Geology/ Quality Control |
| CalPortland Company | Desirea Haggard | 2025 E. Financial Way Glendora, CA 91741 | | Environmental Compliance |
| | | | | |
| | | | | |
| | | | | |

# Appendix N: Construction General Permit

**Not included in the electronic copy.**

A copy of the Construction Storm Water General Permit (NPDES General Permit 2012-0006-DWQ) will be maintained onsite with the hard copy of the SWPPP.

An electronic version of the Permit can be downloaded from the following website:

**http://www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml**

# Appendix O: Acronyms

## Acronyms

| | |
|---|---|
| ASBS | Areas of Special Biological Significance |
| ASTM | American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils |
| ATS | Active Treatment System |
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BAT | Best Available Technology Economically Achievable |
| BCT | Best Conventional Pollutant Control Technology |
| BMP | Best Management Practices |
| BOD | Biochemical Oxygen Demand |
| BPJ | Best Professional Judgment |
| CAFO | Confined Animal Feeding Operation |
| CCR | California Code of Regulations |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CGP | NPDES General Permit for Storm Water Discharges Associated with Construction Activities |
| CIWQS | California Integrated Water Quality System |
| CKD | Cement Kiln Dust |
| COC | Chain of Custody |
| CPESC | Certified Professional in Erosion and Sediment Control |
| CPSWQ | Certified Professional in Storm Water Quality |
| CSMP | Construction Site Monitoring Program |
| CTB | Cement Treated Base |
| CTR | California Toxics Rule |
| CWA | Clean Water Act |
| CWC | California Water Code |
| CWP | Center for Watershed Protection |
| DADMAC | Diallyldimethyl-ammonium chloride |
| DDNR | Delaware Department of Natural Resources |
| DFG | Department of Fish and Game |
| DHS | Department of Health Services |
| DWQ | Division of Water Quality |
| EC | Electrical Conductivity |
| ELAP | Environmental Laboratory Accreditation Program |
| EPA | Environmental Protection Agency |
| ESA | Environmentally Sensitive Area |
| ESC | Erosion and Sediment Control |
| HSPF | Hydrologic Simulation Program Fortran |
| JTU | Jackson Turbidity Units |
| LID | Low Impact Development |
| LOEC | Lowest Observed Effect Concentration |
| LRP | Legally Responsible Person |

| | |
|---|---|
| LUP | Linear Underground / Overhead Projects |
| MATC | Maximum Allowable Threshold Concentration |
| MDL | Method Detection Limits |
| MRR | Monitoring and Reporting Requirements |
| MS4 | Municipal Separate Storm Sewer System |
| MUSLE | Modified Universal Soil Loss Equation |
| NAL | Numeric Action Level |
| NEL | Numeric Effluent Limitation |
| NICET | National Institute for Certification in Engineering Technologies |
| NOAA | National Oceanic and Atmospheric Administration |
| NOEC | No Observed Effect Concentration |
| NOI | Notice of Intent |
| NOT | Notice of Termination |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| NTR | National Toxics Rule |
| NTU | Nephelometric Turbidity Units |
| O&M | Operation and Maintenance |
| PAC | Polyaluminum chloride |
| PAM | Polyacrylamide |
| PASS | Polyaluminum chloride Silica / Sulfate |
| POC | Pollutants of Concern |
| PoP | Probability of Precipitation |
| POTW | Publicly Owned Treatment Works |
| PRDs | Permit Registration Documents |
| PWS | Planning Watershed |
| QAMP | Quality Assurance Management Plan |
| QA / QC | Quality Assurance / Quality Control |
| REAP | Rain Event Action Plan |
| Regional Board | Regional Water Quality Control Board |
| ROWD | Report of Waste Discharge |
| RUSLE | Revised Universal Soil Loss Equation |
| RW | Receiving Water |
| SMARTS | Storm Water Multi Application Reporting and Tracking System |
| SS | Settleable Solids |
| SSC | Suspended Sediment Concentration |
| SUSMP | Standard Urban Storm Water Mitigation Plan |
| SW | Storm Water |
| SWARM | Storm Water Annual Report Module |
| SWAMP | Surface Water Ambient Monitoring Program |
| SWMM | Storm Water Management Model |
| SWMP | Storm Water Management Program |
| SWPPP | Storm Water Pollution Prevention Plan |
| TC | Treatment Control |

| | |
|---|---|
| TDS | Total Dissolved Solids |
| TMDL | Total Maximum Daily Load |
| TSS | Total Suspended Solids |
| USACOE | U.S. Army Corps of Engineers |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| WDID | Waste Discharge Identification Number |
| WDR | Waste Discharge Requirements |
| WLA | Waste Load Allocation |
| WET | Whole Effluent Toxicity |
| WRCC | Western Regional Climate Center |
| WQBEL | Water Quality Based Effluent Limitation |
| WQO | Water Quality Objective |
| WQS | Water Quality Standard |

# *Appendix P: NRCS Soil Resource Report*

# Appendix D: Environmental Lien Search



Privileged and Confidential
Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.

**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA 93501

Inquiry Number: 6336067.7
January 20, 2021

# EDR Environmental Lien and AUL Search

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

# EDR Environmental Lien and AUL Search

The EDR Environmental Lien and AUL Search Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EDR Environmental Lien and AUL Search

**TARGET PROPERTY INFORMATION**

**ADDRESS**

6459 Mojave-Tropico Rd
Gem Hill
Mojave, CA 93501

**ENVIRONMENTAL LIEN**

Environmental Lien: Found ☐ Not Found ☒

**OTHER ACTIVITY AND USE LIMITATIONS (AULs)**

AULs: Found ☐ Not Found ☒

**RESEARCH SOURCE**

---

**Source 1:**

Kern Recorder
Kern, CA

**PROPERTY INFORMATION**

**Deed 1:**

| | |
|---|---|
| Type of Deed: | deed |
| Title is vested in: | Calportland Co |
| Title received from: | Pissamai Patamakanthin Trustee |
| Deed Dated | 11/30/2017 |
| Deed Recorded: | 12/21/2017 |
| Book: | NA |
| Page: | na |
| Volume: | na |
| Instrument: | na |
| Docket: | NA |
| Land Record Comments: | |
| Miscellaneous Comments: | |
| **Legal Description:** | See Exhibit |
| **Legal Current Owner:** | Calportland Co |
| **Parcel # / Property Identifier:** | 345-031-02 |
| **Comments:** | See Exhibit |

**Deed 2:**

| | |
|---|---|
| Type of Deed: | deed |
| Title is vested in: | Calportland Co |
| Title received from: | Joseph Frank Bevacqua |
| Deed Dated | 1/19/2018 |
| Deed Recorded: | 2/23/2018 |
| Book: | NA |
| Page: | na |
| Volume: | na |
| Instrument: | na |
| Docket: | NA |
| Land Record Comments: | |
| Miscellaneous Comments: | |
| **Legal Description:** | See Exhibit |
| **Legal Current Owner:** | Calportland Co |
| **Parcel # / Property Identifier:** | 345-032-05 |
| **Comments:** | See Exhibit |

**Deed 3:**

| | |
|---|---|
| Type of Deed: | deed |
| Title is vested in: | Calportland Co |
| Title received from: | Roy B Woolsey Trustee |
| Deed Dated | 5/7/2018 |

| | |
|---|---|
| Deed Recorded: | 5/24/2018 |
| Book: | NA |
| Page: | na |
| Volume: | na |
| Instrument: | na |
| Docket: | NA |
| Land Record Comments: | |
| Miscellaneous Comments: | |
| **Legal Description:** | See Exhibit |
| **Legal Current Owner:** | Calportland Co |
| **Parcel # / Property Identifier:** | 345-032-31 |
| **Comments:** | See Exhibit |

**Deed 4:**

| | |
|---|---|
| Type of Deed: | deed |
| Title is vested in: | Calportland Co |
| Title received from: | Castro J & Maria E Narvaez Eduardo C & Susana Espi |
| Deed Dated | 11/19/2018 |
| Deed Recorded: | 12/3/2018 |
| Book: | NA |
| Page: | na |
| Volume: | na |
| Instrument: | na |
| Docket: | NA |
| Land Record Comments: | |
| Miscellaneous Comments: | |
| **Legal Description:** | See Exhibit |
| **Legal Current Owner:** | Calportland Co |
| **Parcel # / Property Identifier:** | 345-294-17 |
| **Comments:** | See Exhibit |

# Deed Exhibit 1

Jon Lifquist, Assessor-Recorder
Kern County Official Records

LB
12/21/2017
08:00 AM

**RECORDING REQUESTED BY:**
USA National Title Company, Inc.

**AND WHEN RECORDED MAIL TO:**
CalPortland Co
2025 E. FINANCIAL WAY
GLENDORA, CA 91741

Recorded Electronically by:
710 USA National Title Co

**DOC #:** 217174770

217174770

| | |
|---|---|
| Stat Types: 1 | Pages: 2 |
| FEES | 16.00 |
| TAXES | 638.00 |
| OTHER | .00 |
| PAID | 654.00 |

THIS SPACE FOR RECORDER'S USE ONLY:

**Title Order No.:** 071735452-GD **Escrow No.:** 005914-JS
**AP#:** 345-031-02-00-6

# GRANT DEED

THE UNDERSIGNED GRANTOR(S) DECLARE(S)
**DOCUMENTARY TRANSFER TAX is $**638.00
[X] computed on full value of property conveyed, or
[ ] computed on full value less value of liens or encumbrances remaining at time of sale.
[ ] Unincorporated area [X] City of Kern County Area **AND**

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

**Pissamai Patamakanthin, Trustee of The Patamakanthin Revocable Living Trust**

hereby GRANT(s) to:

**Calportland Company**

the real property in the City of Kern County Area, County of Kern, State of California, described as:
LEGAL DESCRIPTION ATTACHED HERETO AS EXHIBIT "A" AND MADE A PART HEREOF
**Also Known as**: Vacant Land APN# 345-031-02, Kern County Area, CA

Dated November 30, 2017

The Patamakanthin Revocable Living Trust

By: _____
Pissamai Patamakanthin, Trustee

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF Los Angeles

On 12/04/2017 before me, Norma Felix A Notary Public personally appeared Pissamai Patamakanthin who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

NORMA FELIX
Notary Public - California
Los Angeles County
Commission # 2217857
My Comm. Expires Oct 12. 2021

MAIL TAX STATEMENTS TO PARTY SHOWN BELOW; IF NO PARTY SHOWN, MAIL AS SHOWN ABOVE:

Order No.: 071735452-GD

# EXHIBIT 'A'

The South half of Section twenty-six, Township 10 North, Range Thirteen West, S.B.B.M. in the County of Kern, State of California, according to the Official Plat of the Survey of the said land, returned to the general land office by the Surveyor General.

APN: 345-031-02-00-6

# Deed Exhibit 2

RECORDING REQUESTED BY:

Chicago Title Company - Commercial

WHEN RECORDED MAIL TO, AND UNLESS OTHERWISE STATED BELOW, MAIL FUTURE TAX STATEMENTS TO:

CalPortland
2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

Jon Lifquist, Assessor-Recorder
Kern County Official Records

TT
2/23/2018
11:54 AM

Recorded Electronically by:
620 Chicago Title Bakersfield

DOC #: 218020656

218020656

| Stat Types: 1 | Pages: 3 |
|---|---|
| FEES | 19.00 |
| TAXES | 682.00 |
| OTHER | .00 |
| PAID | 701.00 |

This page has been added to provide adequate space for recording information

Documentary Transfer Tax $ 682.00

■ Computer on full value of property conveyed, or

□ Computer on full value less lien & encumbrances remaining at time of sale.

Signature of declarant or agent determining tax/firm name.

# Document Title(s): Grant Deed

Documents believed to be exempt from paying the $75 Building Homes & Jobs Act fee must cite a valid exemption on the face of the document. The following exemptions may apply:

(check applicable)

■ GC 27388.1(a)(2): Recorded in connection with a transfer subject to the imposition of documentary transfer tax; or

□ GC 27388.1: Recorded in connection with a previous transfer of real property that was subject to documentary transfer tax, recorded on _____, in document _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(2): Recorded in connection with a transfer of real property that is a residential dwelling to an owner-occupier; *a Preliminary Change of Ownership Report (PCOR) is required with submission;* or

□ GC 27388.1(a)(2): Recorded in connection with a previous transfer of real property that is a residential dwelling to an owner-occupier; recorded on _____, in document _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(1): The fee cap of $225 reached; or

□ GC 27388.1(a)(1): The fee cap of $225 reached previously in the following document(s) which were recorded on _____, in document(s) _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(1): Not related to real property.

Failure to include a valid exemption will result in the imposition of the $75 Building Homes & Jobs Act fee. Fees collected are deposited to the state and may not be available for refund.

MAIL FUTURE TAX STATEMENTS TO:
CalPortland
2025 E. Financial Way
Glendora, CA 91741

**RECORDING REQUESTED BY:**

CHICAGO TITLE COMPANY – COMMERCIAL

---

**WHEN RECORDED MAIL TO**
**AND MAIL TAX STATEMENTS TO:**

CalPortland
2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

---

Title Order No.:FWKN-TO17002078-LM Space Above This Line For Recorder's Use Escrow No.:83482-TG3

# GRANT DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s):
DOCUMENTARY TRANSFER TAX is $682.00 CITY TAX $ 0.00.
☒ Computed on full value of property conveyed, or ☐ Computed on full value less value of liens or encumbrances remaining at time of sale,
☐ Unincorporated area: ☐ City of Rosamond, and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

**Joseph Frank Bevacqua, a married man as his sole and separate property**

hereby GRANT(s) to

**CalPortland Company, a California Corporation**

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE UNINCORPORATED AREA IN COUNTY OF KERN, STATE OF CALIFORNIA AND IS DESCRIBED AS FOLLOWS:

THE NORTH HALF OF SECTION 35, TOWNSHIP 10 NORTH, RANGE 13 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND APPROVED BY THE SURVEYOR GENERAL FEBRUARY 19, 1856.

THE PLAT OF THE DEPENDENT RESURVEY OF SAID TOWNSHIP WAS FILED IN THE DISTRICT LAND OFFICE OCTOBER 7, 1936.

Assessor's Parcel No. 345-032-05-00

Dated: 1-19-18

Joseph Frank Bevacqua

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA }
COUNTY OF ORANGE } S.S.

On JANUARY 19, 2018 before me, ADA BAKER, a Notary Public in and for said County and State, personally appeared, JOSEPH FRANK BEVACQUA, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: _____

ADA BAKER
Notary Public - California
Orange County
Commission # 2201667
My Comm. Expires Jun 29, 2021

(Notary Seal)

# Deed Exhibit 3

RECORDING REQUESTED BY:

Chicago Title Company - Commercial

WHEN RECORDED MAIL TO, AND UNLESS OTHERWISE STATED BELOW, MAIL FUTURE TAX STATEMENTS TO:

2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

Jon Lifquist, Assessor-Recorder
Kern County Official Records

JL
5/24/2018
08:00 AM

Recorded Electronically by:
620 Chicago Title Bakersfield

DOC #: 218064494

218064494

| Stat Types: 1 | Pages: 3 |
|---|---|
| FEES | 19.00 |
| TAXES | 145.20 |
| OTHER | .00 |
| PAID | 164.20 |

This page has been added to provide adequate space for recording information

Documentary Transfer Tax $ 145.20

■ Computer on full value of property conveyed, or

□ Computer on full value less lien & encumbrances remaining at time of sale.

Signature of declarant or agent determining tax/firm name.

# Document Title(s): Grant Deed

Documents believed to be exempt from paying the $75 Building Homes & Jobs Act fee must cite a valid exemption on the face of the document. The following exemptions may apply:

(check applicable)

■ GC 27388.1(a)(2): Recorded in connection with a transfer subject to the imposition of documentary transfer tax; or

□ GC 27388.1: Recorded in connection with a previous transfer of real property that was subject to documentary transfer tax, recorded on _____, in document _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(2): Recorded in connection with a transfer of real property that is a residential dwelling to an owner-occupier; *a Preliminary Change of Ownership Report (PCOR) is required with submission;* or

□ GC 27388.1(a)(2): Recorded in connection with a previous transfer of real property that is a residential dwelling to an owner-occupier; recorded on _____, in document _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(1): The fee cap of $225 reached; or

□ GC 27388.1(a)(1): The fee cap of $225 reached previously in the following document(s) which were recorded on _____, in document(s) _____; or
*(Must have been recorded on or after January 1, 2018)*

□ GC 27388.1(a)(1): Not related to real property.

Failure to include a valid exemption will result in the imposition of the $75 Building Homes & Jobs Act fee. Fees collected are deposited to the state and may not be available for refund.

MAIL FUTURE TAX STATEMENTS TO:
2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

**RECORDING REQUESTED BY:**

CHICAGO TITLE COMPANY – COMMERCIAL

---

**WHEN RECORDED MAIL TO**
**AND MAIL TAX STATEMENTS TO:**

CalPortland Company
2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

Title Order No.:FWKN-TO18000584-LM Space Above This Line For Recorder's Use Escrow No.:89272-TG3

# GRANT DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s):
DOCUMENTARY TRANSFER TAX is $145.20 CITY TAX $ 0.00.
☒ Computed on full value of property conveyed, or ☐ Computed on full value less value of liens or encumbrances remaining at time of sale,
☒Unincorporated area: ☐ City of Rosamond, and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

**Roy B. Woolsey, as Trustee of the Roy B. Woolsey Trust UDTD November 18, 2004**

hereby GRANT(s) to

**CalPortland Company, a California Corporation**

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE UNINCORPORATED AREA IN COUNTY OF KERN, STATE OF CALIFORNIA AND IS DESCRIBED AS FOLLOWS:

THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 10 NORTH, RANGE 13 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

Assessor's Parcel No. 345-032-31-00

Dated: 7 May 2018

Roy B. Woolsey, as Trustee of the
Roy B. Woolsey Trust UDTD
November 18, 2004

By: Roy B. Woolsey
Name: Roy B. Woolsey
Title: Trustee

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA }
COUNTY OF Santa Clara } S.S.

On 7th day of may, 2018 before me, Fazeel Junaid Dinga, a Notary Public in and for said County and State, personally appeared, Roy B. Woolsey, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: _____

FAZEEL JUNAID DINGA
COMM. #2127561
NOTARY PUBLIC - CALIFORNIA
ALAMEDA COUNTY
My Commission Expires 9/21/2019

(Notary Seal)

# Deed Exhibit 4

Jon Lifquist, Assessor-Recorder
Kern County Official Records

LB
12/03/2018
11:26 AM

Recorded Electronically by:
620 Chicago Title Bakersfield

**DOC #:** 218158263

218158263

| | |
|---|---|
| Stat Types: 1 | Pages: 5 |
| FEES | 25.00 |
| TAXES | 110.00 |
| OTHER | .00 |
| PAID | 135.00 |

**RECORDING REQUESTED BY:**
Chicago Title Company

**Escrow Order No.:** FWKN-TO18001745

**When Recorded Mail Document and Tax Statement To:**
CalPortland Company
2025 E. Financial Way
Glendora, CA 91741
Attn: Nadine Heinrich

APN/Parcel ID(s): 345-294-17-00
345-293-28-00

SPACE ABOVE THIS LINE FOR RECORDER'S USE

Exempt from fee per GC 27388.1 (a) (2); recorded in connection with a transfer subject to the imposition of documentary transfer tax.

# GRANT DEED

## THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION
**(Additional recording fee applies)**

**RECORDING REQUESTED BY:**
Chicago Title/Fresno

**Escrow No.:** 00096914-021-PS4
**Title No.:** FWKN-TO18001745-LM

**WHEN RECORDED MAIL DOCUMENT AND TAX STATEMENT TO:**

**CalPortland Company**
**2025 E. Financial Way**
**Glendora, CA 91741**
**Attn: Nadine Heinrich**

**APN:** 345-294-17 and 345-293-28

SPACE ABOVE THIS LINE FOR RECORDER'S USE

# GRANT DEED

THE UNDERSIGNED GRANTOR(s) DECLARE(s)
DOCUMENTARY TRANSFER TAX is $ 110.00 CITY TAX $ 0.00
✓ computed on full value of interest or property conveyed, or
☐ computed on full value of items or encumbrances remaining at time of sale,
☐ Unincorporated area ☐ City of _____, and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

Casto J. Narvaez and Maria E. Narvaez, husband and wife, as joint tenants, as to an undivided 50% interest, and Eduardo C. Espinoza and Susana Espinoza, husband and wife, as joint tenants, as to an undivided 50% interest

hereby GRANT(s) to

CalPortland Company, a California corporation

the following described real property in the County of Kern, State of California

**SEE EXHIBIT A ATTACHED HERETO AND BY REFERENCE MADE A PART HEREOF**

Dated: 11-19-2018

**Eduardo C. Espinoza and Susana Espinoza,**
**husband and wife, as joint tenants**

**Eduardo C. Espinoza**

**Susana Espinoza**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California )
County of Los Angeles ) SS:

On November 19, 2018 before me, L. Gutierrez Alfonso

a Notary Public, personally appeared Eduardo C. Espinoza, Susana Espinoza

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that ~~he/she~~/they executed the same in his/her/their authorized capacity(ies), and that by ~~his/her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

L. GUTIERREZ ALFONSO
COMM. #2231564
Notary Public - California
Los Angeles County
My Comm. Expires Mar. 7, 2022

**Casto J. Narvaez and Maria E. Narvaez,**
**husband and wife, as joint tenants**

**Casto Narvaez**

**Maria E. Narvaez**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California )
County of Los Angeles ) SS:

On November 19, 2018 before me, L Gutierrez Alfonso

a Notary Public, personally appeared Casto Narvaez, Maria E. Narvaez

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that ~~he/she~~/they executed the same in ~~his/her~~/their authorized capacity(ies), and that by ~~his/her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

L. GUTIERREZ ALFONSO
COMM. #2231564
Notary Public - California
Los Angeles County
My Comm. Expires Mar. 7, 2022

# EXHIBIT A

## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE UNINCORPORATED AREA IN COUNTY OF KERN, STATE OF CALIFORNIA AND IS DESCRIBED AS FOLLOWS:

THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER; AND THE WEST 2 ACRES OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 25, TOWNSHIP 10 NORTH, RANGE 13 WEST SAN BERNARDINO MERIDIAN, IN THE UNINCORPORATED AREA, COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO BERTHA M. FERRELL, AN UNMARRIED WOMAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 297 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 1/32TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO REGINALD L. DYER AND LUCETTE DYER, HIS WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 295 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 1/16TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JAMES RIGA AND PEACHES RIGA, HUSBAND AND WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 299 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO CHARLES C. ASHURST AND EMMA ASHURST, HUSBAND AND WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 301 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JOHN H. SULLIVAN, AN UNMARRIED MAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 303 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 1/16TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND. OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO WALTER H. SULLIVAN, AN UNMARRIED MAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 305 OF OFFICIAL RECORDS.

ALSO EXCEPT AN UNDIVIDED 3/40TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JAMES R. DAVIS AND BROWNIE I. DAVIS, HIS WIFE, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 307 OF OFFICIAL RECORDS.

**APN/Parcel ID(s): 345-294-17-00 and 345-293-28-00**

# Appendix E: Database Search Report



Privileged and Confidential
Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.

**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA  93501

Inquiry Number: 6336067.2s
January 19, 2021

# The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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| Map Findings | 9 |
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| Government Records Searched/Data Currency Tracking | GR-1 |

**GEOCHECK ADDENDUM**

| | |
|---|---|
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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

## TARGET PROPERTY INFORMATION

### ADDRESS

6459 MOJAVE-TROPICO RD
MOJAVE, CA 93501

### COORDINATES

| | |
|---|---|
| Latitude (North): | 34.9217800 - 34° 55' 18.40'' |
| Longitude (West): | 118.2269000 - 118° 13' 36.84'' |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 387931.3 |
| UTM Y (Meters): | 3864858.5 |
| Elevation: | 2944 ft. above sea level |

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

| | |
|---|---|
| Target Property Map: | 5630773 SOLEDAD MOUNTAIN, CA |
| Version Date: | 2012 |
| West Map: | 5630781 WILLOW SPRINGS, CA |
| Version Date: | 2012 |

### AERIAL PHOTOGRAPHY IN THIS REPORT

| | |
|---|---|
| Portions of Photo from: | 20140705, 20140823 |
| Source: | USDA |

# MAPPED SITES SUMMARY

Target Property Address:
6459 MOJAVE-TROPICO RD
MOJAVE, CA 93560

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| A1 | KITTY KAT PROSPECT | | MINES MRDS | Lower | 2668, 0.505, SSW |
| A2 | STILLWELL PROPERTY | | MINES MRDS | Lower | 2720, 0.515, SSW |
| B3 | ROSAMOND HILLS PROPE | 4 MILES NORTH OF WES | CIWQS | Lower | 2768, 0.524, SE |
| B4 | ROSAMOND HILLS PROPE | 4 MILES NORTH OF WES | NPDES, CERS | Lower | 2768, 0.524, SE |
| 5 | ROSAMOND URANIUM PRO | | MINES MRDS | Lower | 4145, 0.785, East |
| 6 | VERDI DEVELOPMENT CO | | MINES MRDS | Lower | 5156, 0.977, ESE |

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

## DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

## STANDARD ENVIRONMENTAL RECORDS

### *Federal NPL site list*

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

### *Federal Delisted NPL site list*

Delisted NPL ---------- National Priority List Deletions

### *Federal CERCLIS list*

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

### *Federal CERCLIS NFRAP site list*

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

### *Federal RCRA CORRACTS facilities list*

CORRACTS ---------- Corrective Action Report

### *Federal RCRA non-CORRACTS TSD facilities list*

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

### *Federal RCRA generators list*

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

### *Federal institutional controls / engineering controls registries*

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROLS..... Institutional Controls Sites List

***Federal ERNS list***

ERNS..... Emergency Response Notification System

***State- and tribal - equivalent NPL***

RESPONSE..... State Response Sites

***State- and tribal - equivalent CERCLIS***

ENVIROSTOR..... EnviroStor Database

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF..... Solid Waste Information System

***State and tribal leaking storage tank lists***

LUST..... Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land
CPS-SLIC..... Statewide SLIC Cases

***State and tribal registered storage tank lists***

FEMA UST..... Underground Storage Tank Listing
UST..... Active UST Facilities
AST..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST..... Underground Storage Tanks on Indian Land

***State and tribal voluntary cleanup sites***

VCP..... Voluntary Cleanup Program Properties
INDIAN VCP..... Voluntary Cleanup Priority Listing

***State and tribal Brownfields sites***

BROWNFIELDS..... Considered Brownfieds Sites Listing

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS..... A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

WMUDS/SWAT..... Waste Management Unit Database
SWRCY..... Recycler Database
HAULERS..... Registered Waste Tire Haulers Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations

| | |
|---|---|
| ODI | Open Dump Inventory |
| IHS OPEN DUMPS | Open Dumps on Indian Land |

***Local Lists of Hazardous waste / Contaminated Sites***

| | |
|---|---|
| US HIST CDL | Delisted National Clandestine Laboratory Register |
| HIST Cal-Sites | Historical Calsites Database |
| SCH | School Property Evaluation Program |
| CDL | Clandestine Drug Labs |
| Toxic Pits | Toxic Pits Cleanup Act Sites |
| CERS HAZ WASTE | CERS HAZ WASTE |
| US CDL | National Clandestine Laboratory Register |
| PFAS | PFAS Contamination Site Location Listing |

***Local Lists of Registered Storage Tanks***

| | |
|---|---|
| SWEEPS UST | SWEEPS UST Listing |
| HIST UST | Hazardous Substance Storage Container Database |
| CA FID UST | Facility Inventory Database |
| CERS TANKS | California Environmental Reporting System (CERS) Tanks |

***Local Land Records***

| | |
|---|---|
| LIENS | Environmental Liens Listing |
| LIENS 2 | CERCLA Lien Information |
| DEED | Deed Restriction Listing |

***Records of Emergency Release Reports***

| | |
|---|---|
| HMIRS | Hazardous Materials Information Reporting System |
| CHMIRS | California Hazardous Material Incident Report System |
| LDS | Land Disposal Sites Listing |
| MCS | Military Cleanup Sites Listing |
| SPILLS 90 | SPILLS 90 data from FirstSearch |

***Other Ascertainable Records***

| | |
|---|---|
| RCRA NonGen / NLR | RCRA - Non Generators / No Longer Regulated |
| FUDS | Formerly Used Defense Sites |
| DOD | Department of Defense Sites |
| SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing |
| US FIN ASSUR | Financial Assurance Information |
| EPA WATCH LIST | EPA WATCH LIST |
| 2020 COR ACTION | 2020 Corrective Action Program List |
| TSCA | Toxic Substances Control Act |
| TRIS | Toxic Chemical Release Inventory System |
| SSTS | Section 7 Tracking Systems |
| ROD | Records Of Decision |
| RMP | Risk Management Plans |
| RAATS | RCRA Administrative Action Tracking System |
| PRP | Potentially Responsible Parties |
| PADS | PCB Activity Database System |
| ICIS | Integrated Compliance Information System |
| FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) |

MLTS Material Licensing Tracking System
COAL ASH DOE Steam-Electric Plant Operation Data
COAL ASH EPA Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER PCB Transformer Registration Database
RADINFO Radiation Information Database
HIST FTTS FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS Incident and Accident Data
CONSENT Superfund (CERCLA) Consent Decrees
INDIAN RESERV Indian Reservations
FUSRAP Formerly Utilized Sites Remedial Action Program
UMTRA Uranium Mill Tailings Sites
LEAD SMELTERS Lead Smelter Sites
US AIRS Aerometric Information Retrieval System Facility Subsystem
US MINES Mines Master Index File
ABANDONED MINES Abandoned Mines
FINDS Facility Index System/Facility Registry System
UXO Unexploded Ordnance Sites
DOCKET HWC Hazardous Waste Compliance Docket Listing
ECHO Enforcement & Compliance History Information
FUELS PROGRAM EPA Fuels Program Registered Listing
CA BOND EXP. PLAN Bond Expenditure Plan
Cortese "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings CUPA Resources List
DRYCLEANERS Cleaner Facilities
EMI Emissions Inventory Data
ENF Enforcement Action Listing
Financial Assurance Financial Assurance Information Listing
HAZNET Facility and Manifest Data
ICE ICE
HIST CORTESE Hazardous Waste & Substance Site List
HWP EnviroStor Permitted Facilities Listing
HWT Registered Hazardous Waste Transporter Database
MINES Mines Site Location Listing
MWMP Medical Waste Management Program Listing
PEST LIC Pesticide Regulation Licenses Listing
PROC Certified Processors Database
Notify 65 Proposition 65 Records
UIC UIC Listing
UIC GEO UIC GEO (GEOTRACKER)
WASTEWATER PITS Oil Wastewater Pits Listing
WDS Waste Discharge System
WIP Well Investigation Program Case List
MILITARY PRIV SITES MILITARY PRIV SITES (GEOTRACKER)
PROJECT PROJECT (GEOTRACKER)
WDR Waste Discharge Requirements Listing
NON-CASE INFO NON-CASE INFO (GEOTRACKER)
OTHER OIL GAS OTHER OIL & GAS (GEOTRACKER)
PROD WATER PONDS PROD WATER PONDS (GEOTRACKER)
SAMPLING POINT SAMPLING POINT (GEOTRACKER)
WELL STIM PROJ Well Stimulation Project (GEOTRACKER)
HWTS Hazardous Waste Tracking System

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP EDR Proprietary Manufactured Gas Plants

# EXECUTIVE SUMMARY

EDR Hist Auto---------- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner---------- EDR Exclusive Historical Cleaners

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF---------- Recovered Government Archive Solid Waste Facilities List
RGA LUST---------- Recovered Government Archive Leaking Underground Storage Tank

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Other Ascertainable Records***

NPDES: A listing of NPDES permits, including stormwater.

A review of the NPDES list, as provided by EDR, and dated 08/10/2020 has revealed that there is 1 NPDES site within approximately 1 mile of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***ROSAMOND HILLS PROPE***<br>Facility Status: Terminated | ***4 MILES NORTH OF WES*** | ***SE 1/2 - 1 (0.524 mi.)*** | ***B4*** | ***11*** |

CIWQS: The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

A review of the CIWQS list, as provided by EDR, and dated 08/31/2020 has revealed that there is 1 CIWQS site within approximately 1 mile of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ROSAMOND HILLS PROPE | 4 MILES NORTH OF WES | SE 1/2 - 1 (0.524 mi.) | B3 | 11 |

# EXECUTIVE SUMMARY

CERS: The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

A review of the CERS list, as provided by EDR, and dated 10/19/2020 has revealed that there is 1 CERS site within approximately 1 mile of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***ROSAMOND HILLS PROPE*** | ***4 MILES NORTH OF WES*** | ***SE 1/2 - 1 (0.524 mi.)*** | ***B4*** | ***11*** |

MINES MRDS: Mineral Resources Data System

A review of the MINES MRDS list, as provided by EDR, and dated 04/06/2018 has revealed that there are 4 MINES MRDS sites within approximately 1 mile of the target property.

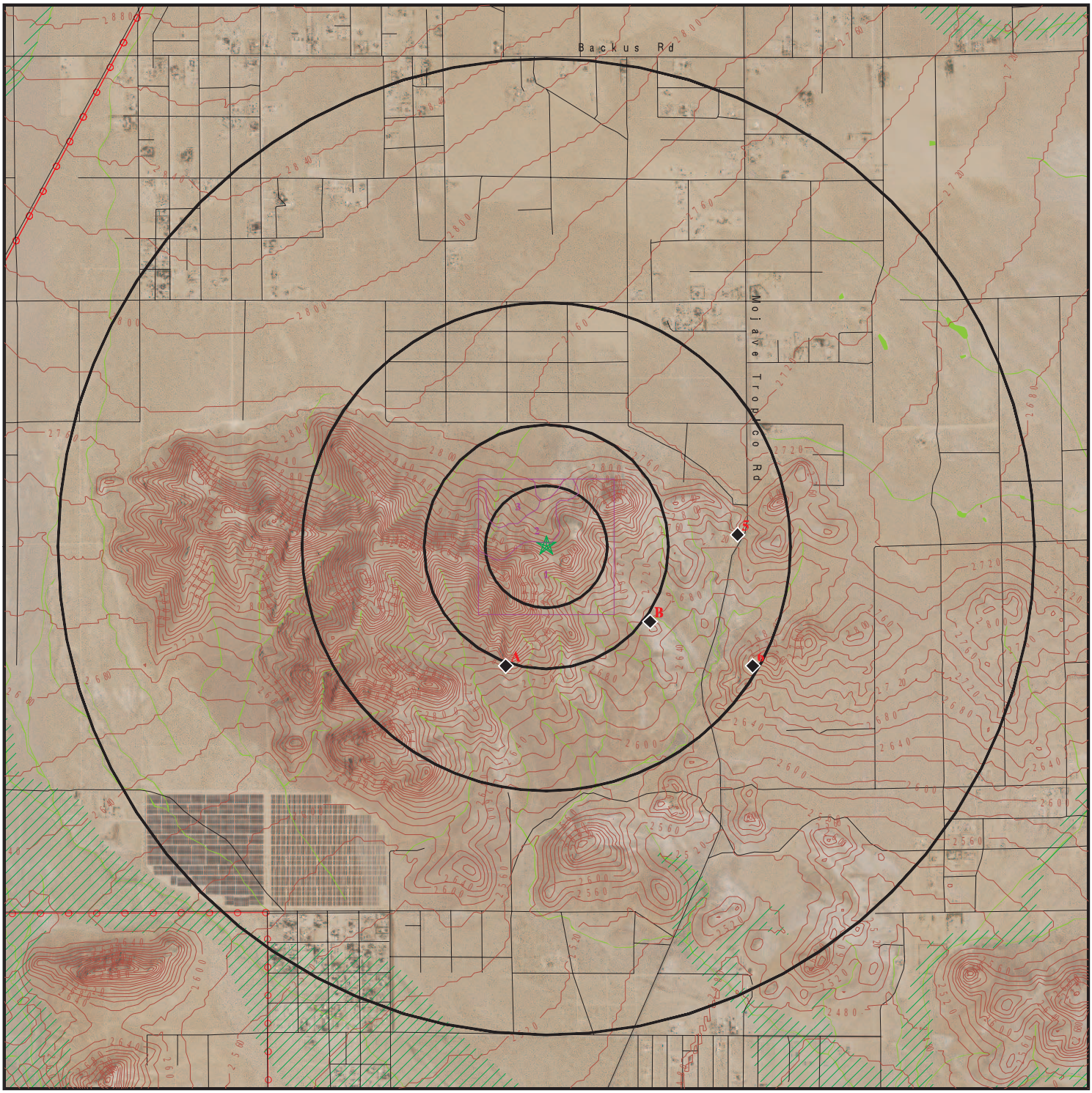
| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| KITTY KAT PROSPECT | | SSW 1/2 - 1 (0.505 mi.) | A1 | 9 |
| STILLWELL PROPERTY | | SSW 1/2 - 1 (0.515 mi.) | A2 | 10 |
| ROSAMOND URANIUM PRO | | E 1/2 - 1 (0.785 mi.) | 5 | 13 |
| VERDI DEVELOPMENT CO | | ESE 1/2 - 1 (0.977 mi.) | 6 | 14 |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 2 records.

| Site Name | Database(s) |
|---|---|
| SWEETSER ROAD UNAUTHORIZED DISPOSA | CDL<br>ENVIROSTOR |

# OVERVIEW MAP - 6336067.2S




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

0 1/2 1 2 Miles

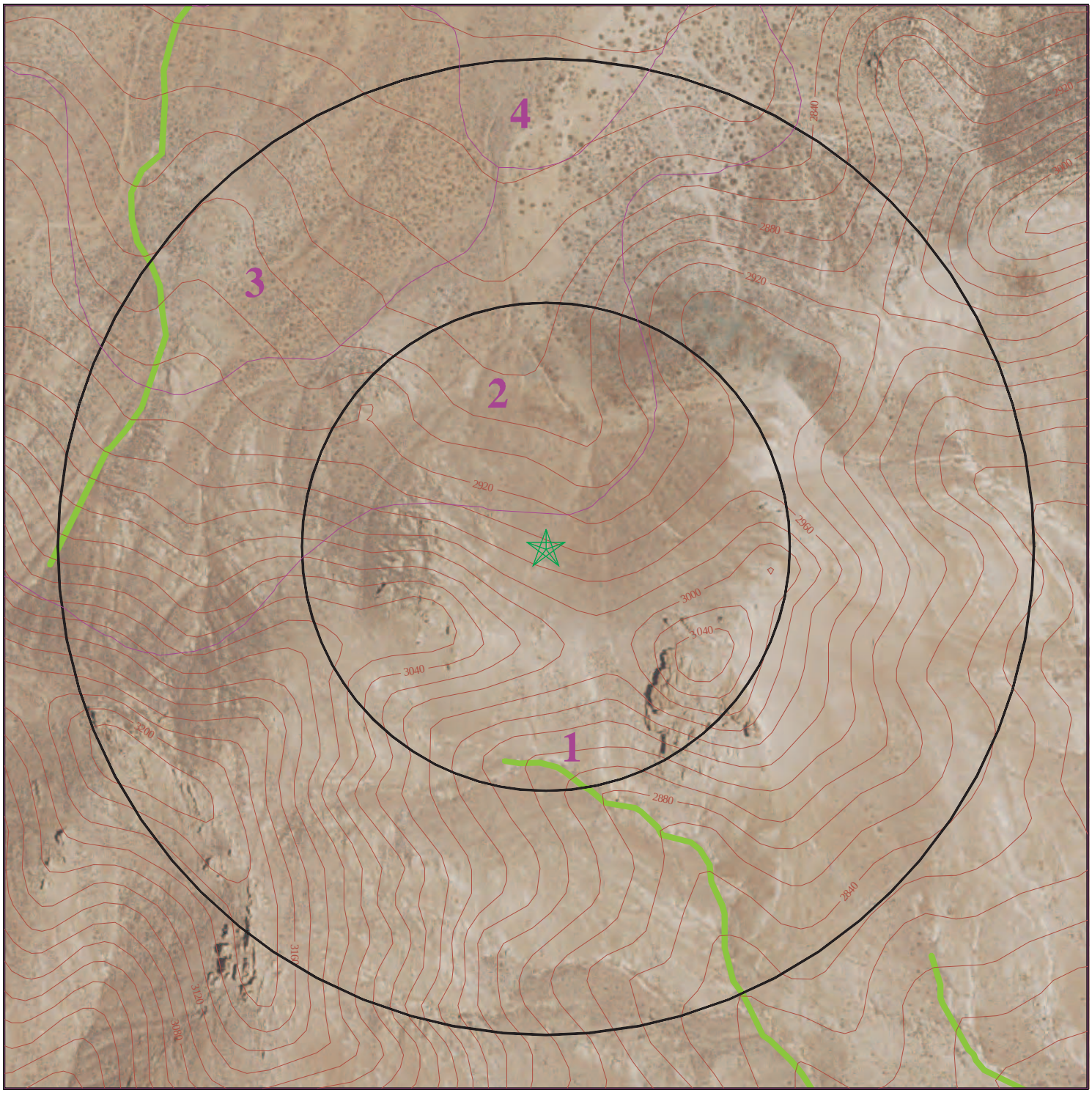
- Indian Reservations BIA
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:07 pm |

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# DETAIL MAP - 6336067.2S




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:11 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Federal NPL site list*** | | | | | | | | |
| NPL | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Proposed NPL | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| NPL LIENS | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | | |
| Delisted NPL | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal CERCLIS list*** | | | | | | | | |
| FEDERAL FACILITY | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| SEMS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal CERCLIS NFRAP site list*** | | | | | | | | |
| SEMS-ARCHIVE | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | | |
| CORRACTS | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | | |
| RCRA-TSDF | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal RCRA generators list*** | | | | | | | | |
| RCRA-LQG | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| RCRA-SQG | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| RCRA-VSQG | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| LUCIS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| US ENG CONTROLS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| US INST CONTROLS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***State- and tribal - equivalent NPL*** | | | | | | | | |
| RESPONSE | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State- and tribal - equivalent CERCLIS*** | | | | | | | | |
| ENVIROSTOR | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | | |
| SWF/LF | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | | |
| LUST | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| INDIAN LUST | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CPS-SLIC | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal registered storage tank lists*** | | | | | | | | |
| FEMA UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| AST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| INDIAN UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal voluntary cleanup sites*** | | | | | | | | |
| VCP | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| INDIAN VCP | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***State and tribal Brownfields sites*** | | | | | | | | |
| BROWNFIELDS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| WMUDS/SWAT | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| SWRCY | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| HAULERS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN ODI | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| DEBRIS REGION 9 | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ODI | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| IHS OPEN DUMPS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US HIST CDL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HIST Cal-Sites | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| SCH | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CDL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Toxic Pits | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CERS HAZ WASTE | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| US CDL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PFAS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Local Lists of Registered Storage Tanks*** | | | | | | | | |
| SWEEPS UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| HIST UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CA FID UST | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CERS TANKS | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| LIENS 2 | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| DEED | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CHMIRS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| LDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| MCS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SPILLS 90 | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| FUDS | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| DOD | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| SCRD DRYCLEANERS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| US FIN ASSUR | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EPA WATCH LIST | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| 2020 COR ACTION | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| TSCA | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| TRIS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SSTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ROD | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| RMP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RAATS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PRP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PADS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ICIS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FTTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| MLTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| COAL ASH DOE | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| COAL ASH EPA | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| PCB TRANSFORMER | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RADINFO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HIST FTTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| DOT OPS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CONSENT | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| INDIAN RESERV | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| FUSRAP | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| UMTRA | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| LEAD SMELTERS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| US AIRS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| US MINES | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| ABANDONED MINES | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| FINDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UXO | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| DOCKET HWC | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ECHO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUELS PROGRAM | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CA BOND EXP. PLAN | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Cortese | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| CUPA Listings | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| DRYCLEANERS | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| EMI | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ENF | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Financial Assurance | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HAZNET | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ICE | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HIST CORTESE | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| HWP | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| HWT | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| MINES | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| MWMP | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| NPDES | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| PEST LIC | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PROC | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Notify 65 | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| UIC | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UIC GEO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| WASTEWATER PITS | 1.500 | | 0 | 0 | 0 | 0 | 0 | 0 |
| WDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| WIP | 1.250 | | 0 | 0 | 0 | 0 | 0 | 0 |
| MILITARY PRIV SITES | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PROJECT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| WDR | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CIWQS | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| CERS | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| NON-CASE INFO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| OTHER OIL GAS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| PROD WATER PONDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SAMPLING POINT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| WELL STIM PROJ | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HWTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| MINES MRDS | 1.000 | | 0 | 0 | 0 | 4 | NR | 4 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 2.000 | | 0 | 0 | 0 | 0 | 0 | 0 |
| EDR Hist Auto | 1.125 | | 0 | 0 | 0 | 0 | 0 | 0 |
| EDR Hist Cleaner | 1.125 | | 0 | 0 | 0 | 0 | 0 | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RGA LUST | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| - Totals -- | | 0 | 0 | 0 | 0 | 7 | 0 | 7 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

**A1**
**SSW**
**1/2-1**
**0.505 mi.**
**2668 ft.**

**KITTY KAT PROSPECT**
**ROSAMOND, CA 93560**
**Site 1 of 2 in cluster A**

**MINES MRDS** **1025775121**
**N/A**

**Relative:**
**Lower**

**Actual:**
**2795 ft.**

MINES MRDS:

| | |
|---|---|
| Name: | KITTY KAT PROSPECT |
| Address: | Not reported |
| Deposit identification Number: | 10304639 |
| City,State,Zip: | ROSAMOND, CALIFORNIA 93560 |
| URL: | https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10304639 |
| MRDS Identification Number: | Not reported |
| MAS/MILS Identification Number: | 0060290789 |
| Region: | NA |
| Country: | United States |
| Primary Commodities: | Uranium |
| Secondary Commodities: | Not reported |
| Tertiary Commodities: | Not reported |
| Operation Type: | Unknown |
| Deposit Type: | Not reported |
| Production Size: | Not reported |
| Development Status: | Occurrence |
| Ore Minerals or Materials: | Not reported |
| Gangue Minerals or Materials: | Not reported |
| Other Minerals or Materials: | Not reported |
| Ore Body Form: | Not reported |
| Workings Type: | Not reported |
| Mineral Deposit Model: | Not reported |
| Alteration Processes: | Not reported |
| Concentration Processes: | Not reported |
| Previous Names: | Not reported |
| Ore Controls: | Not reported |
| Reporter: | Raney, Russell G. |
| Host Rock Unit Name: | Not reported |
| Host Rock Type: | Not reported |
| Associated Rock Unit Name: | Not reported |
| Associated Rock Type Code: | Not reported |
| Structural Characteristics: | Not reported |
| Tectonic Setting: | Not reported |
| References: | Not reported |
| First Production Year: | Not reported |
| Began Before/After FPY: | Not reported |
| Last Production Year: | Not reported |
| Ended Before/After LPY: | Not reported |
| Year Discovered: | Not reported |
| Found Before/After YD: | Not reported |
| Production History: | Not reported |
| Discovery Information: | Not reported |
| Latitude: | 34.9147 |
| Longitude: | -118.22921 |

**A2**
**SSW**
**1/2-1**
**0.515 mi.**
**2720 ft.**

**STILLWELL PROPERTY**
**ROSAMOND, CA 93560**
**Site 2 of 2 in cluster A**

**MINES MRDS** **1025667677**
**N/A**

**Relative:**
**Lower**

**Actual:**
**2791 ft.**

MINES MRDS:

| | |
|---|---|
| Name: | STILLWELL PROPERTY |
| Address: | Not reported |
| Deposit identification Number: | 10188154 |
| City,State,Zip: | ROSAMOND, CALIFORNIA 93560 |
| URL: | https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10188154 |
| MRDS Identification Number: | Not reported |
| MAS/MILS Identification Number: | 0060290871 |
| Region: | NA |
| Country: | United States |
| Primary Commodities: | Uranium |
| Secondary Commodities: | Not reported |
| Tertiary Commodities: | Not reported |
| Operation Type: | Surface |
| Deposit Type: | Not reported |
| Production Size: | Not reported |
| Development Status: | Past Producer |
| Ore Minerals or Materials: | Not reported |
| Gangue Minerals or Materials: | Not reported |
| Other Minerals or Materials: | Not reported |
| Ore Body Form: | Not reported |
| Workings Type: | Not reported |
| Mineral Deposit Model: | Not reported |
| Alteration Processes: | Not reported |
| Concentration Processes: | Not reported |
| Previous Names: | Not reported |
| Ore Controls: | Not reported |
| Reporter: | Raney, Russell G. |
| Host Rock Unit Name: | Not reported |
| Host Rock Type: | Not reported |
| Associated Rock Unit Name: | Not reported |
| Associated Rock Type Code: | Not reported |
| Structural Characteristics: | Not reported |
| Tectonic Setting: | Not reported |
| References: | Not reported |
| First Production Year: | Not reported |
| Began Before/After FPY: | Not reported |
| Last Production Year: | Not reported |
| Ended Before/After LPY: | Not reported |
| Year Discovered: | Not reported |
| Found Before/After YD: | Not reported |
| Production History: | Not reported |
| Discovery Information: | Not reported |
| Latitude: | 34.9147 |
| Longitude: | -118.22981 |

**B3** **ROSAMOND HILLS PROPERTY** **CIWQS** **S123170547**
**SE** **4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD** **N/A**
**1/2-1** **ROSAMOND, CA 91750**
**0.524 mi.**
**2768 ft.** **Site 1 of 2 in cluster B**

**Relative:** **Lower**
**Actual:** **2686 ft.**

CIWQS:

| | |
|---|---|
| Name: | ROSAMOND HILLS PROPERTY |
| Address: | 4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD |
| City,State,Zip: | ROSAMOND, CA 91750 |
| Agency: | CalPortland Co |
| Agency Address: | 2025 E Financial Way, Glendora, CA 91741 |
| Place/Project Type: | Construction - Industrial |
| SIC/NAICS: | Not reported |
| Region: | 6V |
| Program: | CONSTW |
| Regulatory Measure Status: | Terminated |
| Regulatory Measure Type: | Storm water construction |
| Order Number: | 2009-0009-DWQ |
| WDID: | 6B15C384488 |
| NPDES Number: | CAS000002 |
| Adoption Date: | Not reported |
| Effective Date: | 09/05/2018 |
| Termination Date: | 11/20/2019 |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 34.917331 |
| Longitude: | -118.21941 |

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**B4** **ROSAMOND HILLS PROPERTY** **NPDES** **S123143327**
**SE** **4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD** **CERS** **N/A**
**1/2-1** **ROSAMOND, CA 91750**
**0.524 mi.**
**2768 ft.** **Site 2 of 2 in cluster B**

**Relative:** **Lower**
**Actual:** **2686 ft.**

NPDES:

| | |
|---|---|
| Name: | ROSAMOND HILLS PROPERTY |
| Address: | 4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD |
| City,State,Zip: | ROSAMOND, CA 91750 |
| Facility Status: | Terminated |
| NPDES Number: | CAS000002 |
| Region: | 6B |
| Agency Number: | 0 |
| Regulatory Measure ID: | 501038 |
| Place ID: | Not reported |
| Order Number: | 2009-0009-DWQ |
| WDID: | 6B15C384488 |
| Regulatory Measure Type: | Enrollee |
| Program Type: | Construction |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 09/05/2018 |
| Termination Date Of Regulatory Measure: | 11/20/2019 |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | 2025 E Financial Way |
| Discharge Name: | CalPortland Co |

**ROSAMOND HILLS PROPERTY (Continued)** **S123143327**

| | |
|---|---|
| Discharge City: | Glendora |
| Discharge State: | California |
| Discharge Zip: | 91741 |
| Status: | Not reported |
| Status Date: | Not reported |
| Operator Name: | Not reported |
| Operator Address: | Not reported |
| Operator City: | Not reported |
| Operator State: | Not reported |
| Operator Zip: | Not reported |

| | |
|---|---|
| Name: | ROSAMOND HILLS PROPERTY |
| Address: | 4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD |
| City,State,Zip: | ROSAMOND, CA 91750 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 6B15C384488 |
| Regulatory Measure Type: | Construction |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | Terminated |
| Status Date: | 02/06/2020 |
| Operator Name: | CalPortland Co |
| Operator Address: | 2025 E Financial Way |
| Operator City: | Glendora |
| Operator State: | California |
| Operator Zip: | 91741 |

CERS:

| | |
|---|---|
| Name: | ROSAMOND HILLS PROPERTY |
| Address: | 4 MILES NORTH OF WEST ROSAMOND BLVD ON TROPICO RD |
| City,State,Zip: | ROSAMOND, CA 91750 |
| Site ID: | 541185 |
| CERS ID: | 866571 |
| CERS Description: | Construction Storm Water |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Owner/Operator |
| Entity Name: | CalPortland Co |
| Entity Title: | Operator |
| Affiliation Address: | 2025 E Financial Way |
| Affiliation City: | Glendora |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |

**ROSAMOND HILLS PROPERTY (Continued)** **S123143327**

Affiliation Zip: 91741
Affiliation Phone: Not reported

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**5** **ROSAMOND URANIUM PROSPECT** **MINES MRDS** **1025600348**
**East** **N/A**
**1/2-1** **ROSAMOND, CA 93560**
**0.785 mi.**
**4145 ft.**

**Relative:** **Lower**

**Actual:** **2744 ft.**

MINES MRDS:

| | |
|---|---|
| Name: | ROSAMOND URANIUM PROSPECT |
| Address: | Not reported |
| Deposit identification Number: | 10115153 |
| City,State,Zip: | ROSAMOND, CALIFORNIA 93560 |
| URL: | https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10115153 |
| MRDS Identification Number: | W017755 |
| MAS/MILS Identification Number: | 0060290791 |
| Region: | NA |
| Country: | United States |
| Primary Commodities: | Uranium |
| Secondary Commodities: | Not reported |
| Tertiary Commodities: | Gold, Silver |
| Operation Type: | Surface |
| Deposit Type: | Not reported |
| Production Size: | Not reported |
| Development Status: | Prospect |
| Ore Minerals or Materials: | Not reported |
| Gangue Minerals or Materials: | Not reported |
| Other Minerals or Materials: | Not reported |
| Ore Body Form: | Not reported |
| Workings Type: | Not reported |
| Mineral Deposit Model: | Not reported |
| Alteration Processes: | Not reported |
| Concentration Processes: | Not reported |
| Previous Names: | Rosamond-Mojave |
| Ore Controls: | Not reported |
| Reporter: | Raney, Russell G. |
| Host Rock Unit Name: | Not reported |
| Host Rock Type: | Not reported |
| Associated Rock Unit Name: | Not reported |
| Associated Rock Type Code: | Not reported |
| Structural Characteristics: | Not reported |
| Tectonic Setting: | Not reported |
| References: | Not reported |
| First Production Year: | Not reported |
| Began Before/After FPY: | Not reported |
| Last Production Year: | Not reported |
| Ended Before/After LPY: | Not reported |
| Year Discovered: | Not reported |
| Found Before/After YD: | Not reported |
| Production History: | Not reported |
| Discovery Information: | Not reported |
| Latitude: | 34.9225 |
| Longitude: | -118.2131 |

**6**
**ESE**
**1/2-1**
**0.977 mi.**
**5156 ft.**

**VERDI DEVELOPMENT CO, ANOMALY NO 3**
**MOJAVE, CA 93501**

**MINES MRDS** **1025690031**
**N/A**

**Relative:**
**Lower**

**Actual:**
**2751 ft.**

MINES MRDS:

| | |
|---|---|
| Name: | VERDI DEVELOPMENT CO, ANOMALY NO 3 |
| Address: | Not reported |
| Deposit identification Number: | 10212380 |
| City,State,Zip: | MOJAVE, CALIFORNIA 93501 |
| URL: | https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10212380 |
| MRDS Identification Number: | Not reported |
| MAS/MILS Identification Number: | 0060290867 |
| Region: | NA |
| Country: | United States |
| Primary Commodities: | Uranium |
| Secondary Commodities: | Not reported |
| Tertiary Commodities: | Not reported |
| Operation Type: | Surface-Underground |
| Deposit Type: | Not reported |
| Production Size: | Not reported |
| Development Status: | Prospect |
| Ore Minerals or Materials: | Not reported |
| Gangue Minerals or Materials: | Not reported |
| Other Minerals or Materials: | Not reported |
| Ore Body Form: | Not reported |
| Workings Type: | Not reported |
| Mineral Deposit Model: | Not reported |
| Alteration Processes: | Not reported |
| Concentration Processes: | Not reported |
| Previous Names: | Not reported |
| Ore Controls: | Not reported |
| Reporter: | Raney, Russell G. |
| Host Rock Unit Name: | Not reported |
| Host Rock Type: | Not reported |
| Associated Rock Unit Name: | Not reported |
| Associated Rock Type Code: | Not reported |
| Structural Characteristics: | Not reported |
| Tectonic Setting: | Not reported |
| References: | Not reported |
| First Production Year: | Not reported |
| Began Before/After FPY: | Not reported |
| Last Production Year: | Not reported |
| Ended Before/After LPY: | Not reported |
| Year Discovered: | Not reported |
| Found Before/After YD: | Not reported |
| Production History: | Not reported |
| Discovery Information: | Not reported |
| Latitude: | 34.9147 |
| Longitude: | -118.212 |

Count: 2 records. ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| MOJAVE | S107526549 | | 0.8 MILE N OF BACAUS RD/MOJAVE | 93501 | CDL |
| ROSAMOND | S100714218 | SWEETSER ROAD UNAUTHORIZED DISPOSA | SWEETSER RD NEAR HWY 14 & FRON | 93560 | ENVIROSTOR |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

**STANDARD ENVIRONMENTAL RECORDS**

***Federal NPL site list***

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

***Federal Delisted NPL site list***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: N/A
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

***Federal CERCLIS list***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/23/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Quarterly

***Federal CERCLIS NFRAP site list***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Quarterly

***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

***Federal institutional controls / engineering controls registries***

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/11/2020
Number of Days to Update: 82

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

***State- and tribal - equivalent NPL***

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 10/26/2020
Date Made Active in Reports: 01/13/2021
Number of Days to Update: 79

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

***State- and tribal - equivalent CERCLIS***

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 10/26/2020
Date Made Active in Reports: 01/13/2021
Number of Days to Update: 79

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/09/2020
Date Data Arrived at EDR: 11/10/2020
Date Made Active in Reports: 01/14/2021
Number of Days to Update: 65

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/10/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Quarterly

***State and tribal leaking storage tank lists***

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/29/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/26/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 78
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/15/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

***State and tribal registered storage tank lists***

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 07/21/2020
Date Data Arrived at EDR: 09/03/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 83
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 09/03/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/03/2020
Number of Days to Update: 86

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/03/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/29/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 85

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/26/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 78

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 12/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

***State and tribal voluntary cleanup sites***

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 10/26/2020
Date Made Active in Reports: 01/13/2021
Number of Days to Update: 79

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

***State and tribal Brownfields sites***

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/21/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/11/2020
Number of Days to Update: 80

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/14/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/11/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Semi-Annually

***Local Lists of Landfill / Solid Waste Disposal Sites***

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 05/28/2020
Date Data Arrived at EDR: 05/29/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 75

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 10/30/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 03/18/2020
Date Data Arrived at EDR: 03/19/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 10/26/2020
Date Made Active in Reports: 01/13/2021
Number of Days to Update: 79

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/26/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2019
Date Data Arrived at EDR: 05/28/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/07/2021
Number of Days to Update: 80

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 03/18/2020
Date Data Arrived at EDR: 03/19/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 82

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Quarterly

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS contaminated sites included in the GeoTracker database.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

***Local Lists of Registered Storage Tanks***

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 05/20/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/06/2020
Number of Days to Update: 78

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing
Aboveground storage tank sites

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 78

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/07/2021
Number of Days to Update: 80

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Local Land Records***

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 08/26/2020
Date Data Arrived at EDR: 08/28/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 81

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/20/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/07/2021
Number of Days to Update: 80
Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 5

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 69

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 01/07/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/21/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88
Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73
Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/06/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85
Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 07/24/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/14/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/27/2020
Date Data Arrived at EDR: 05/06/2020
Date Made Active in Reports: 06/09/2020
Number of Days to Update: 34
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 10/09/2019
Date Data Arrived at EDR: 10/11/2019
Date Made Active in Reports: 12/20/2019
Number of Days to Update: 70
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/08/2020
Number of Days to Update: 59
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/12/2020
Next Scheduled EDR Contact: 01/31/2021
Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 12/04/2019
Date Made Active in Reports: 01/15/2020
Number of Days to Update: 42
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 11/30/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/06/2021
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/27/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 10/08/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 88

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/23/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/06/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/20/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 20

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/14/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/04/2020
Date Data Arrived at EDR: 08/25/2020
Date Made Active in Reports: 11/18/2020
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 09/10/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 66
Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 11/24/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78
Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97
Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/16/2020
Date Data Arrived at EDR: 09/17/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 84
Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/10/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 09/04/2020
Date Data Arrived at EDR: 09/15/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 66
Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77
Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/17/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 10/03/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 90
Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 10/21/2020
Number of Days to Update: 65
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6
Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/22/2020
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 09/04/2020
Number of Days to Update: 74
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/17/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing
list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 05/01/2019
Date Data Arrived at EDR: 05/14/2019
Date Made Active in Reports: 07/17/2019
Number of Days to Update: 64
Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 11/13/2020
Number of Days to Update: 79

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/28/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 81

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Annually

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 08/19/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 09/04/2020
Number of Days to Update: 14

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 06/16/2020
Date Made Active in Reports: 08/28/2020
Number of Days to Update: 73

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 10/16/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/07/2021
Number of Days to Update: 80

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 10/13/2020
Date Data Arrived at EDR: 10/14/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 08/05/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 79

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/04/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 04/15/2020
Date Made Active in Reports: 07/02/2020
Number of Days to Update: 78

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/05/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/17/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/05/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 78

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/05/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/10/2020
Date Made Active in Reports: 10/29/2020
Number of Days to Update: 80
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 12/10/2020
Number of Days to Update: 1
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/07/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 11/19/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/09/2020
Number of Days to Update: 62
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/13/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 81

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/19/2020
Date Made Active in Reports: 01/07/2021
Number of Days to Update: 80

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 11/30/2020
Number of Days to Update: 83
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/04/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Varies

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120
Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55
Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

HWTS: Hazardous Waste Tracking System
DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 10/13/2020
Date Data Arrived at EDR: 10/14/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 20
Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 11/25/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: Varies

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Varies

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners
EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**COUNTY RECORDS**

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 78

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/22/2020
Date Made Active in Reports: 01/12/2021
Number of Days to Update: 82

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/24/2020
Number of Days to Update: 8

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/22/2020
Date Made Active in Reports: 01/13/2021
Number of Days to Update: 83

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 06/08/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 70

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 70

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 77

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 10/14/2020
Date Data Arrived at EDR: 10/15/2020
Date Made Active in Reports: 01/05/2021
Number of Days to Update: 82

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 10/29/2020
Date Data Arrived at EDR: 10/30/2020
Date Made Active in Reports: 01/15/2021
Number of Days to Update: 77

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 07/28/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 10/14/2020
Number of Days to Update: 76

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/11/2020
Date Data Arrived at EDR: 05/12/2020
Date Made Active in Reports: 07/27/2020
Number of Days to Update: 76

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 08/13/2020
Date Data Arrived at EDR: 08/13/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 71

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/11/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 10/19/2020
Date Data Arrived at EDR: 10/20/2020
Date Made Active in Reports: 01/12/2021
Number of Days to Update: 84

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/04/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 10/09/2020
Date Made Active in Reports: 12/29/2020
Number of Days to Update: 81

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/12/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 08/17/2020
Date Made Active in Reports: 11/05/2020
Number of Days to Update: 80

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/11/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 04/30/2012
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 42
Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 01/15/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58
Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/18/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 07/20/2020
Date Data Arrived at EDR: 10/09/2020
Date Made Active in Reports: 12/29/2020
Number of Days to Update: 81
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/12/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/07/2020
Next Scheduled EDR Contact: 01/25/2021
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 09/11/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 77

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/05/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/28/2020
Date Data Arrived at EDR: 07/30/2020
Date Made Active in Reports: 07/31/2020
Number of Days to Update: 1

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 08/20/2020
Date Data Arrived at EDR: 08/24/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 77

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 11/15/2020
Next Scheduled EDR Contact: 03/08/3021
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/13/2020
Date Data Arrived at EDR: 07/15/2020
Date Made Active in Reports: 07/31/2020
Number of Days to Update: 16

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 10/28/2020
Date Made Active in Reports: 01/15/2021
Number of Days to Update: 79

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 10/20/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 06/10/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/19/2020
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/02/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 79

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/02/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/01/2020
Date Data Arrived at EDR: 08/03/2020
Date Made Active in Reports: 10/19/2020
Number of Days to Update: 77

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/03/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/24/2020
Date Made Active in Reports: 11/25/2020
Number of Days to Update: 1

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/06/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/06/2020
Date Data Arrived at EDR: 10/07/2020
Date Made Active in Reports: 11/03/2020
Number of Days to Update: 27
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/18/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/15/2020
Number of Days to Update: 76
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/24/2020
Date Data Arrived at EDR: 03/31/2020
Date Made Active in Reports: 06/17/2020
Number of Days to Update: 78
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/30/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 10/28/2020
Date Data Arrived at EDR: 10/30/2020
Date Made Active in Reports: 01/15/2021
Number of Days to Update: 77
Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/04/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 82
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 08/31/2020
Date Data Arrived at EDR: 08/31/2020
Date Made Active in Reports: 11/23/2020
Number of Days to Update: 84

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing

A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/14/2020
Date Data Arrived at EDR: 07/16/2020
Date Made Active in Reports: 09/29/2020
Number of Days to Update: 75

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/22/2020
Number of Days to Update: 78

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 08/03/2020
Date Data Arrived at EDR: 08/05/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 82

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/09/2020
Next Scheduled EDR Contact: 03/29/2021
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 07/27/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 75

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/11/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/01/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 08/20/2020
Date Data Arrived at EDR: 08/20/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 81

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/16/2020
Next Scheduled EDR Contact: 03/08/2021
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 07/30/2020
Date Data Arrived at EDR: 07/31/2020
Date Made Active in Reports: 10/16/2020
Number of Days to Update: 77

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/03/2019
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 09/16/2020
Number of Days to Update: 21

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/03/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 12/23/2020
Number of Days to Update: 7

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 09/18/2020
Date Data Arrived at EDR: 09/22/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 83

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 04/05/2021
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 10/06/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 77

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 01/11/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 08/25/2020
Date Data Arrived at EDR: 08/26/2020
Date Made Active in Reports: 11/17/2020
Number of Days to Update: 83

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 11/23/2020
Next Scheduled EDR Contact: 03/15/2021
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 08/11/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 75

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 10/14/2020
Date Data Arrived at EDR: 10/15/2020
Date Made Active in Reports: 01/05/2021
Number of Days to Update: 82

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/06/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 81

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 10/28/2020
Next Scheduled EDR Contact: 02/15/2021
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/13/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 09/28/2020
Date Data Arrived at EDR: 10/22/2020
Date Made Active in Reports: 01/12/2021
Number of Days to Update: 82
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/21/2020
Next Scheduled EDR Contact: 04/12/2021
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/05/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/28/2020
Date Data Arrived at EDR: 10/22/2020
Date Made Active in Reports: 01/12/2021
Number of Days to Update: 82
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/19/2020
Next Scheduled EDR Contact: 02/01/2021
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/26/2020
Date Data Arrived at EDR: 09/08/2020
Date Made Active in Reports: 12/01/2020
Number of Days to Update: 84
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/08/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 12/21/2020
Date Data Arrived at EDR: 12/23/2020
Date Made Active in Reports: 01/04/2021
Number of Days to Update: 12
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/20/2020
Next Scheduled EDR Contact: 04/11/2021
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 08/06/2020
Date Data Arrived at EDR: 08/07/2020
Date Made Active in Reports: 10/26/2020
Number of Days to Update: 80

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 11/03/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 10/20/2020
Date Made Active in Reports: 11/02/2020
Number of Days to Update: 13

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/09/2020
Next Scheduled EDR Contact: 02/22/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/08/2021
Next Scheduled EDR Contact: 04/19/2021
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 10/30/2020
Next Scheduled EDR Contact: 02/08/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/11/2021
Next Scheduled EDR Contact: 04/26/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 10/02/2019
Date Made Active in Reports: 12/10/2019
Number of Days to Update: 69

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/11/2020
Next Scheduled EDR Contact: 03/01/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/03/2020
Next Scheduled EDR Contact: 03/22/2021
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

GEM HILL
6459 MOJAVE-TROPICO RD
MOJAVE, CA 93501

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 34.92178 - 34° 55' 18.41'' |
| Longitude (West): | 118.2269 - 118° 13' 36.84'' |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 387931.3 |
| UTM Y (Meters): | 3864858.5 |
| Elevation: | 2944 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 5630773 SOLEDAD MOUNTAIN, CA |
| Version Date: | 2012 |
| West Map: | 5630781 WILLOW SPRINGS, CA |
| Version Date: | 2012 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

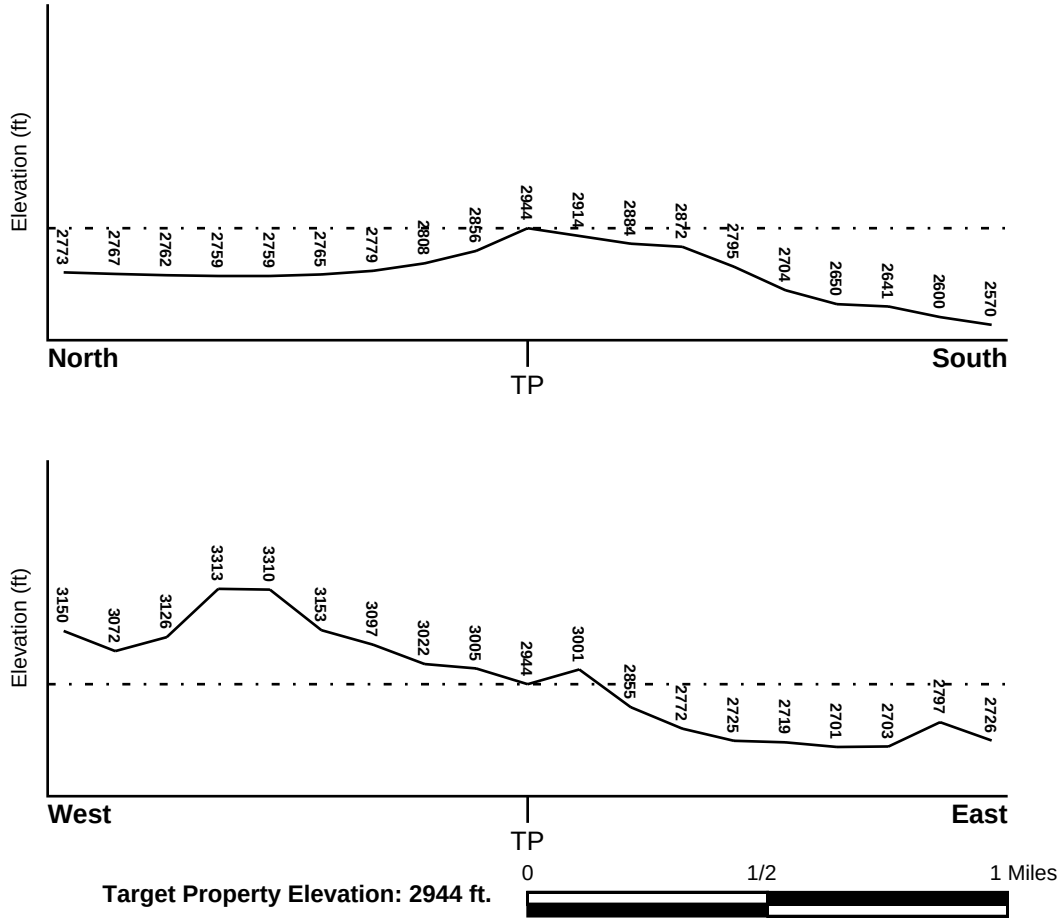
**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General ENE

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




**Target Property Elevation: 2944 ft.**

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Flood Plain Panel at Target Property | FEMA Source Type |
|---|---|
| 06029C3675E | FEMA FIRM Flood data |

| Additional Panels in search area: | FEMA Source Type |
|---|---|
| Not Reported | |

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| SOLEDAD MOUNTAIN | YES - refer to the Overview Map and Detail Map |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

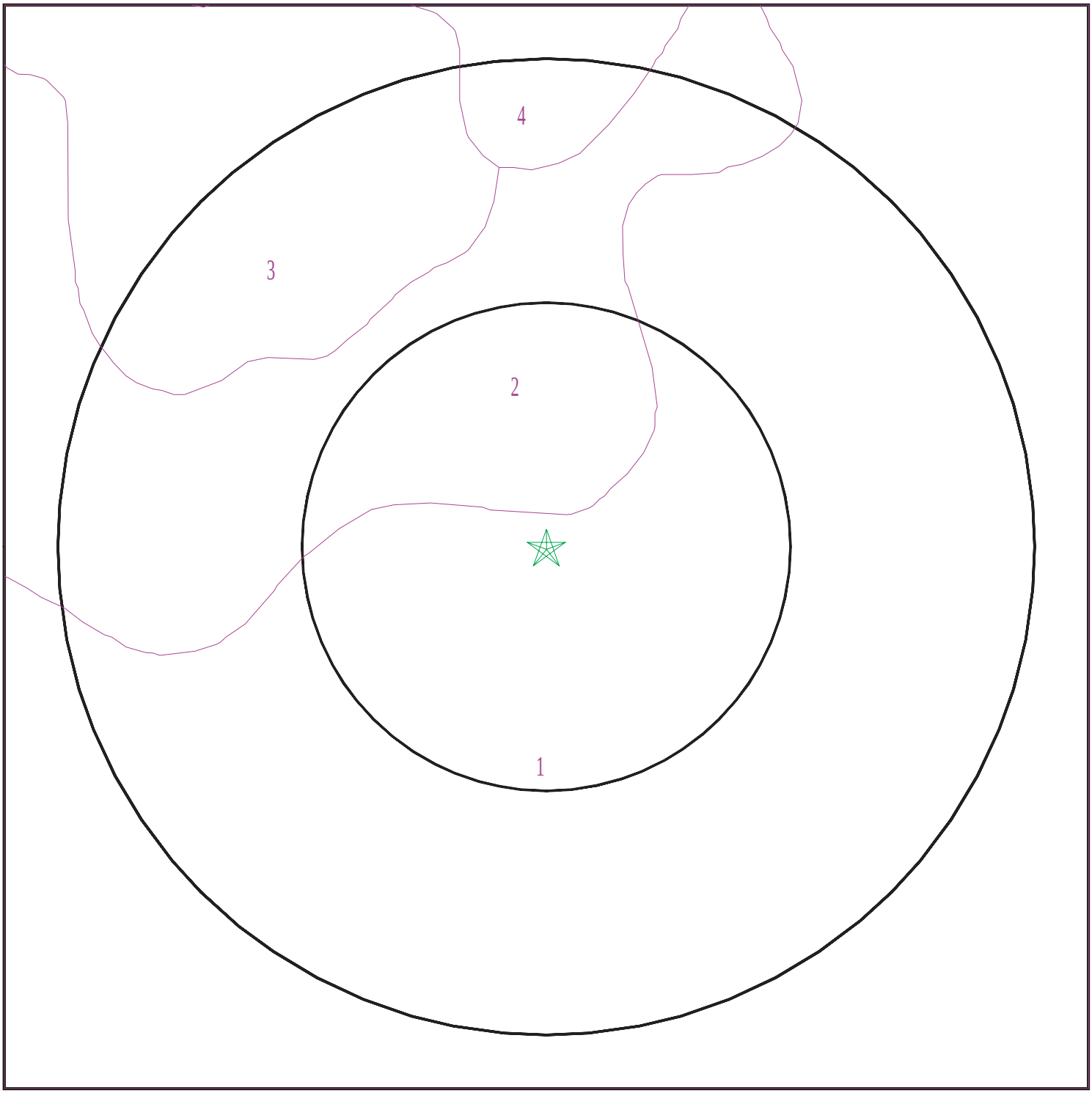
| | |
|---|---|
| Era: | Cenozoic |
| System: | Quaternary |
| Series: | Quaternary |
| Code: | Q *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 6336067.2s




Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:12 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

---

**Soil Map ID: 1**

Soil Component Name: ROCK OUTCROP

Soil Surface Texture:
Hydrologic Group: Not reported

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

---

**Soil Map ID: 2**

Soil Component Name: TORRIORTHENTS

Soil Surface Texture:
Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 20 inches | | Not reported | Not reported | Max:<br>Min: | Max: Min: |
| 2 | 20 inches | 24 inches | | Not reported | Not reported | Max:<br>Min: | Max: Min: |

---

**Soil Map ID: 3**

Soil Component Name: PORTERVILLE

Soil Surface Texture:
Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | | Not reported | Not reported | Max: 1.4<br>Min: 0.42 | Max: 8.4<br>Min: 6.6 |
| 2 | 11 inches | 35 inches | | Not reported | Not reported | Max: 1.4<br>Min: 0.42 | Max: 8.4<br>Min: 6.6 |
| 3 | 35 inches | 59 inches | | Not reported | Not reported | Max: 1.4<br>Min: 0.42 | Max: 8.4<br>Min: 6.6 |

---

**Soil Map ID: 4**

Soil Component Name: ARIZO

Soil Surface Texture:
Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 3 inches | | Not reported | Not reported | Max: 141<br>Min: 141 | Max: 8.4<br>Min: 7.4 |
| 2 | 3 inches | 64 inches | | Not reported | Not reported | Max: 141<br>Min: 141 | Max: 8.4<br>Min: 7.4 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

**WELL SEARCH DISTANCE INFORMATION**

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

**FEDERAL USGS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No PWS System Found | | |

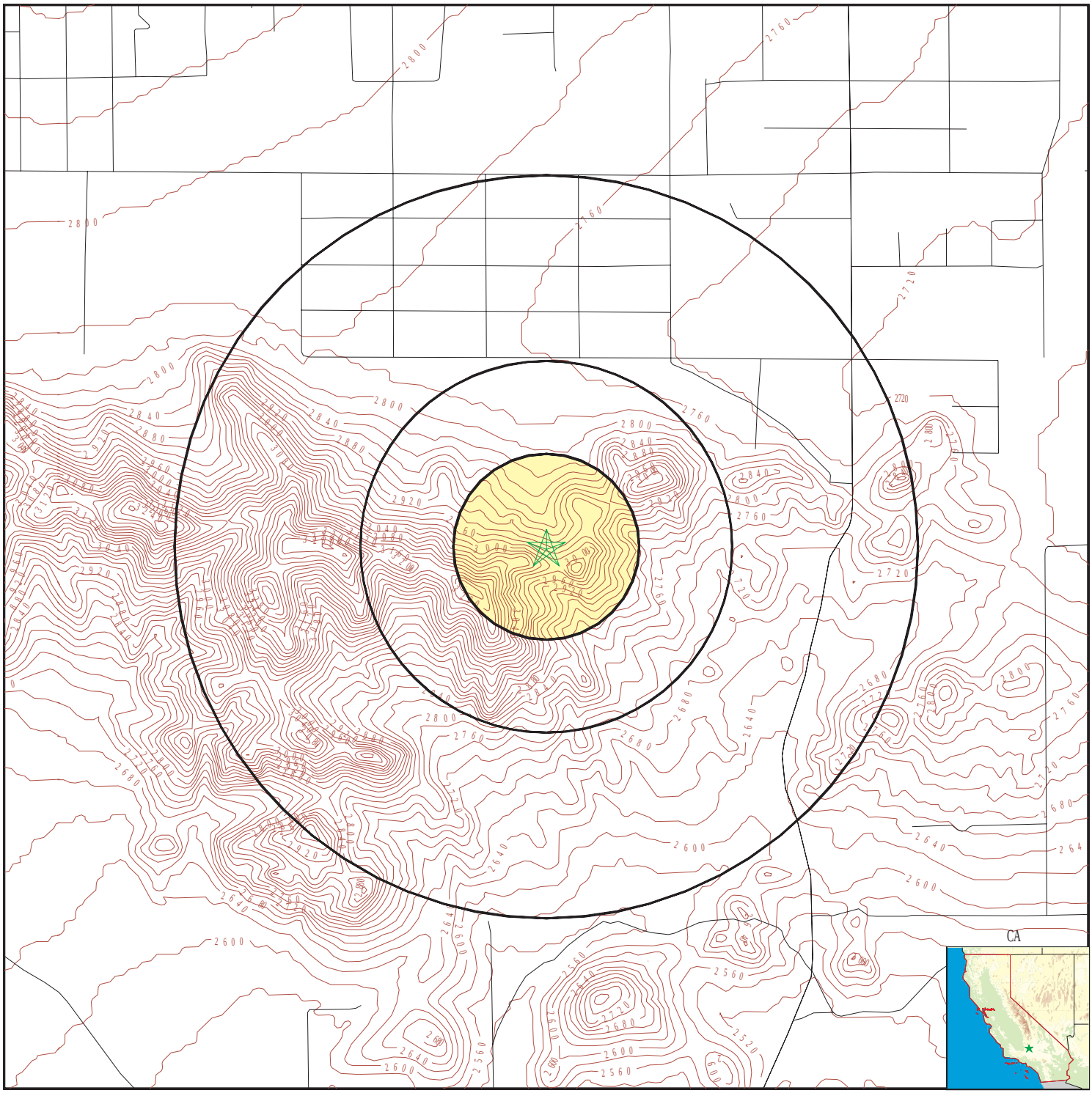
Note: PWS System location is not always the same as well location.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**STATE DATABASE WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

# PHYSICAL SETTING SOURCE MAP - 6336067.2s




- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:11 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

State Database: CA Radon

Radon Test Results

| Zipcode | Num Tests | > 4 pCi/L |
|---|---|---|
| 93560 | 12 | 1 |

Federal EPA Radon Zone for KERN County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for Zip Code: 93560

Number of sites tested: 2

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 0.250 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | Not Reported | Not Reported | Not Reported | Not Reported |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

## HYDROGEOLOGIC INFORMATION

AQUIFLOW$^{R}$ Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

## OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

**STREET AND ADDRESS INFORMATION**

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# Appendix F: Historical Aerial Photographs



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**Gem Hill**

6459 Mojave-Tropico Rd

Mojave, CA 93501

Inquiry Number: 6336067.11

January 21, 2021

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

01/21/21

**Site Name:**

Gem Hill
6459 Mojave-Tropico Rd
Mojave, CA 93501
EDR Inquiry # 6336067.11

**Client Name:**

Brown & Caldwell Consultants
9665 Chesapeake Drive
San Diego, CA 92123
Contact: Corey Strauss

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

***Search Results:***

| Year | Scale | Details | Source |
|---|---|---|---|
| 2016 | 1"=1000' | Flight Year: 2016 | USDA/NAIP |
| 2012 | 1"=1000' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=1000' | Flight Year: 2009 | USDA/NAIP |
| 2005 | 1"=1000' | Flight Year: 2005 | USDA/NAIP |
| 1994 | 1"=1000' | Acquisition Date: January 01, 1994 | USGS/DOQQ |
| 1987 | 1"=1000' | Flight Date: January 01, 1987 | USDA |
| 1977 | 1"=1000' | Flight Date: January 01, 1977 | USGS |
| 1972 | 1"=1000' | Flight Date: January 01, 1972 | USGS |
| 1963 | 1"=1000' | Flight Date: January 01, 1963 | USGS |
| 1956 | 1"=1000' | Flight Date: January 01, 1956 | USGS |

**When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.**


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INQUIRY #: 6336067.11

YEAR: 2016

= 1000'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 6336067.11

YEAR: 2012

= 1000'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 6336067.11

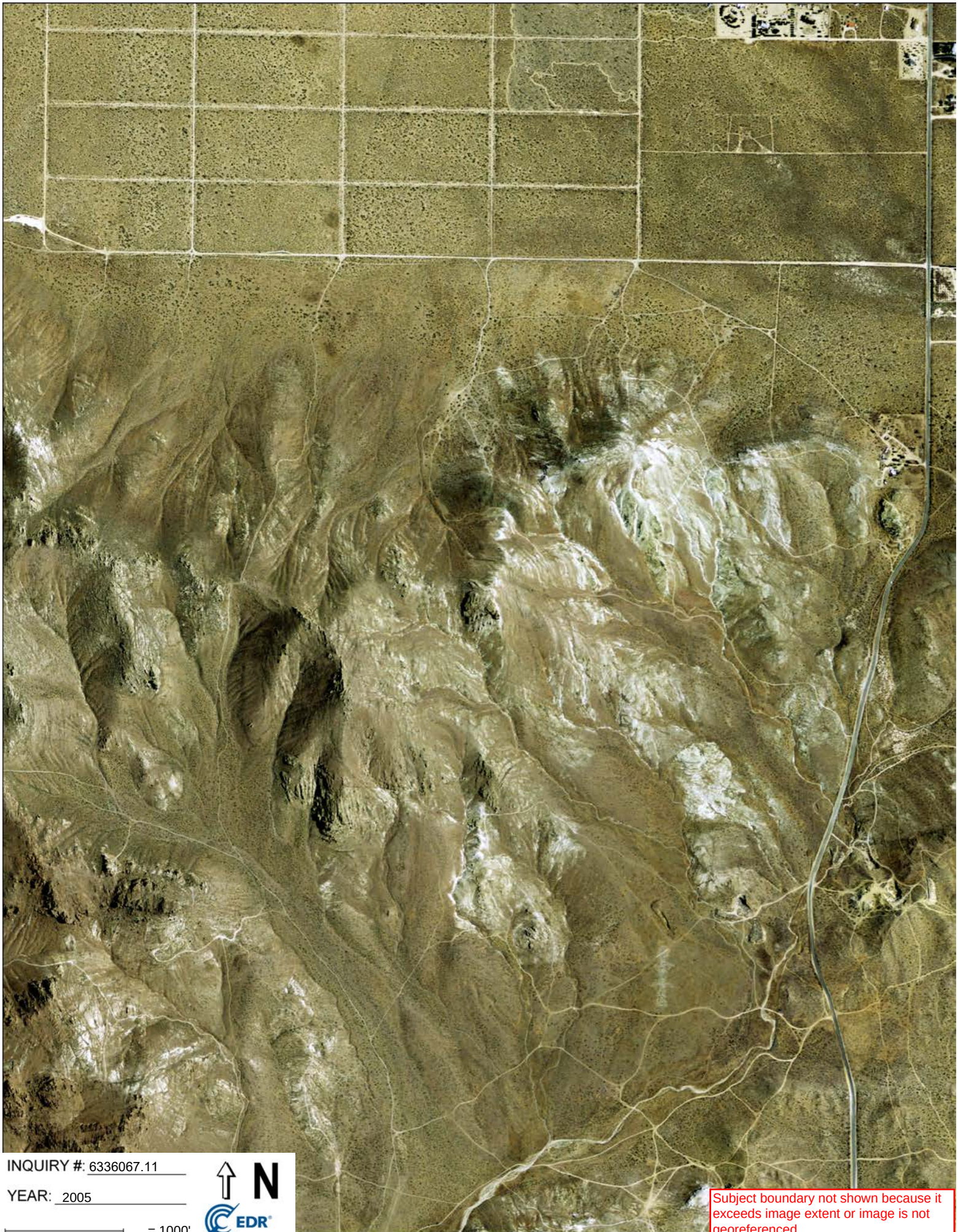
YEAR: 2009

= 1000'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 6336067.11

YEAR: 2005

= 1000'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 6336067.11

YEAR: 1994

= 1000'

N

EDR



INQUIRY #: 6336067.11

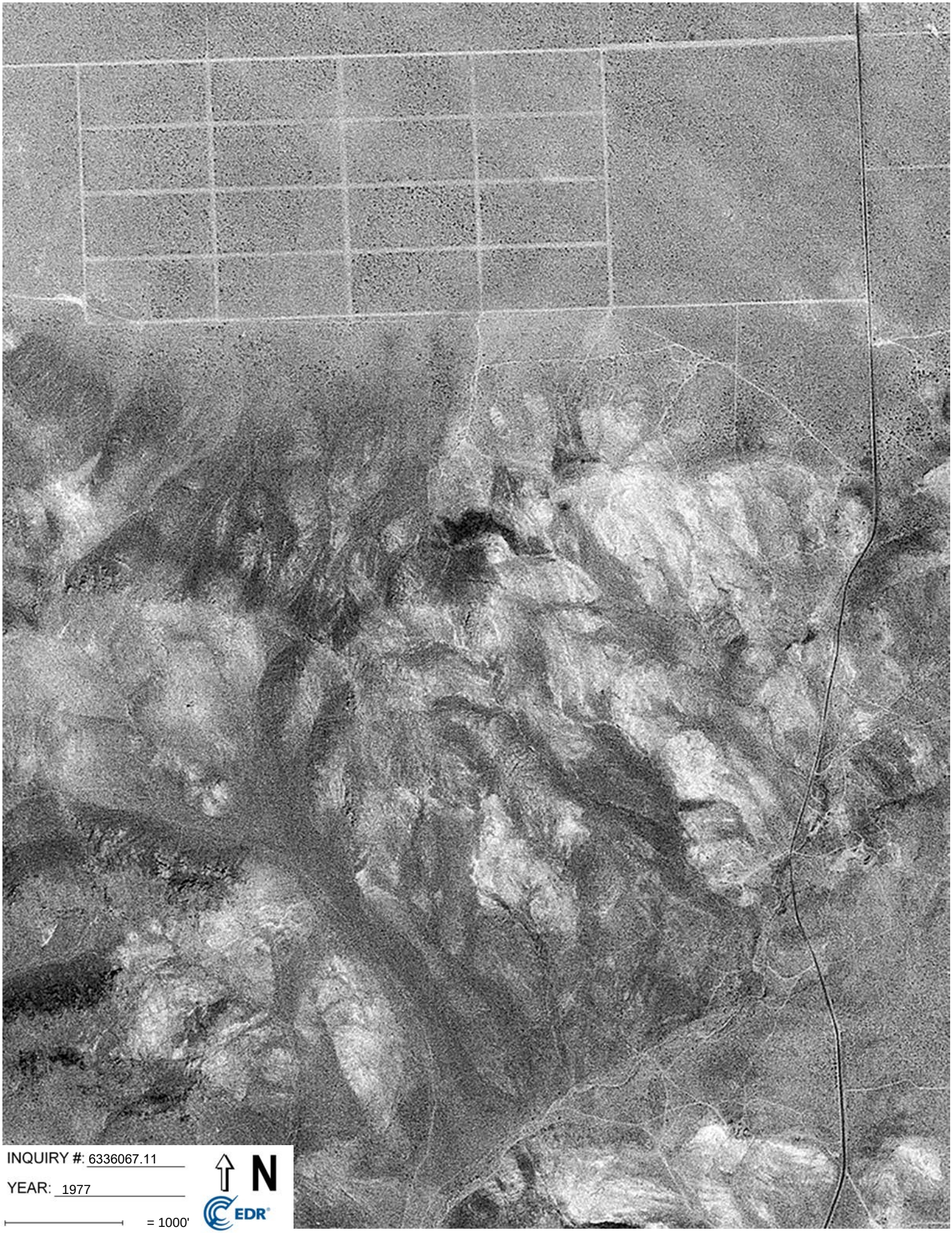
YEAR: 1987

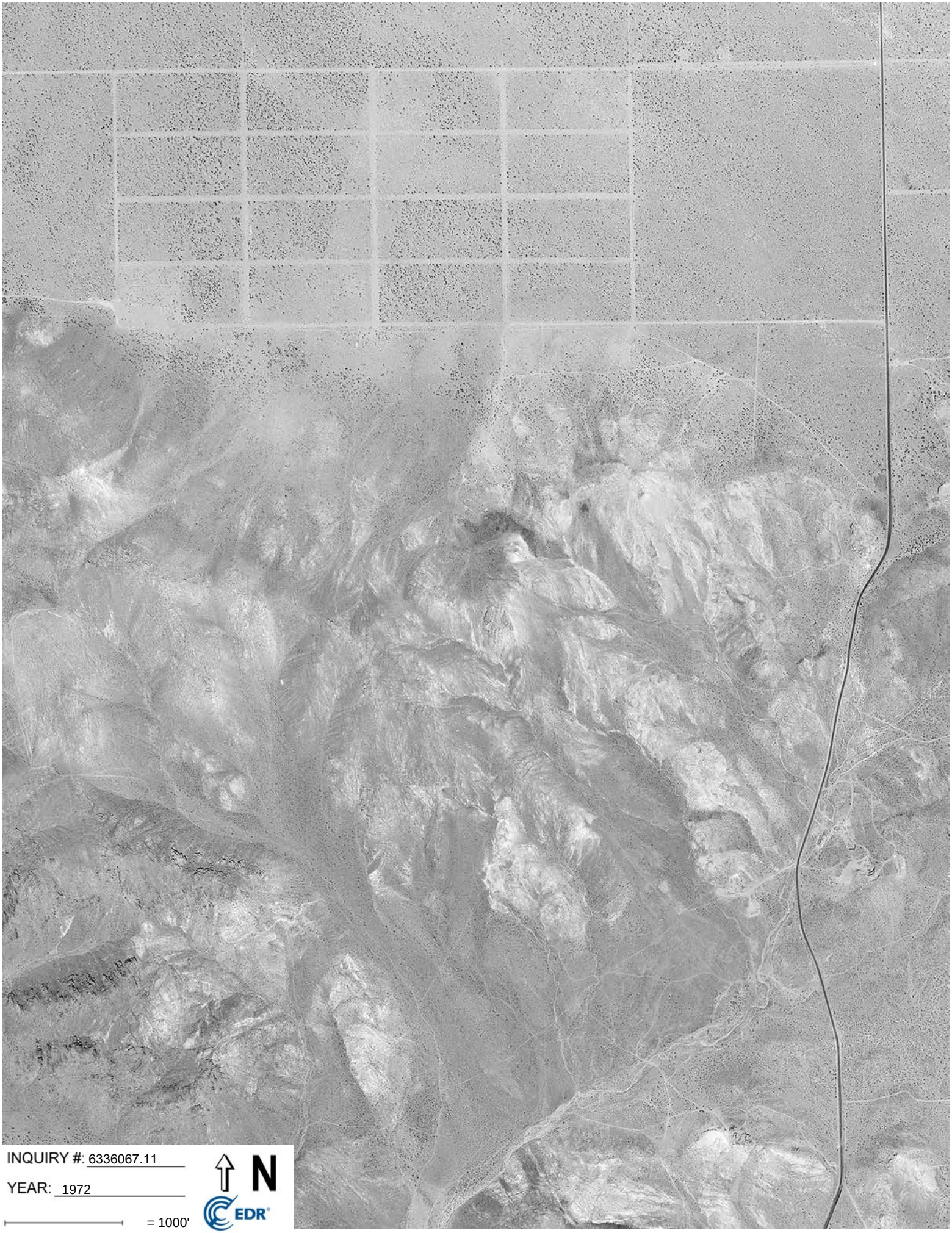
= 1000'

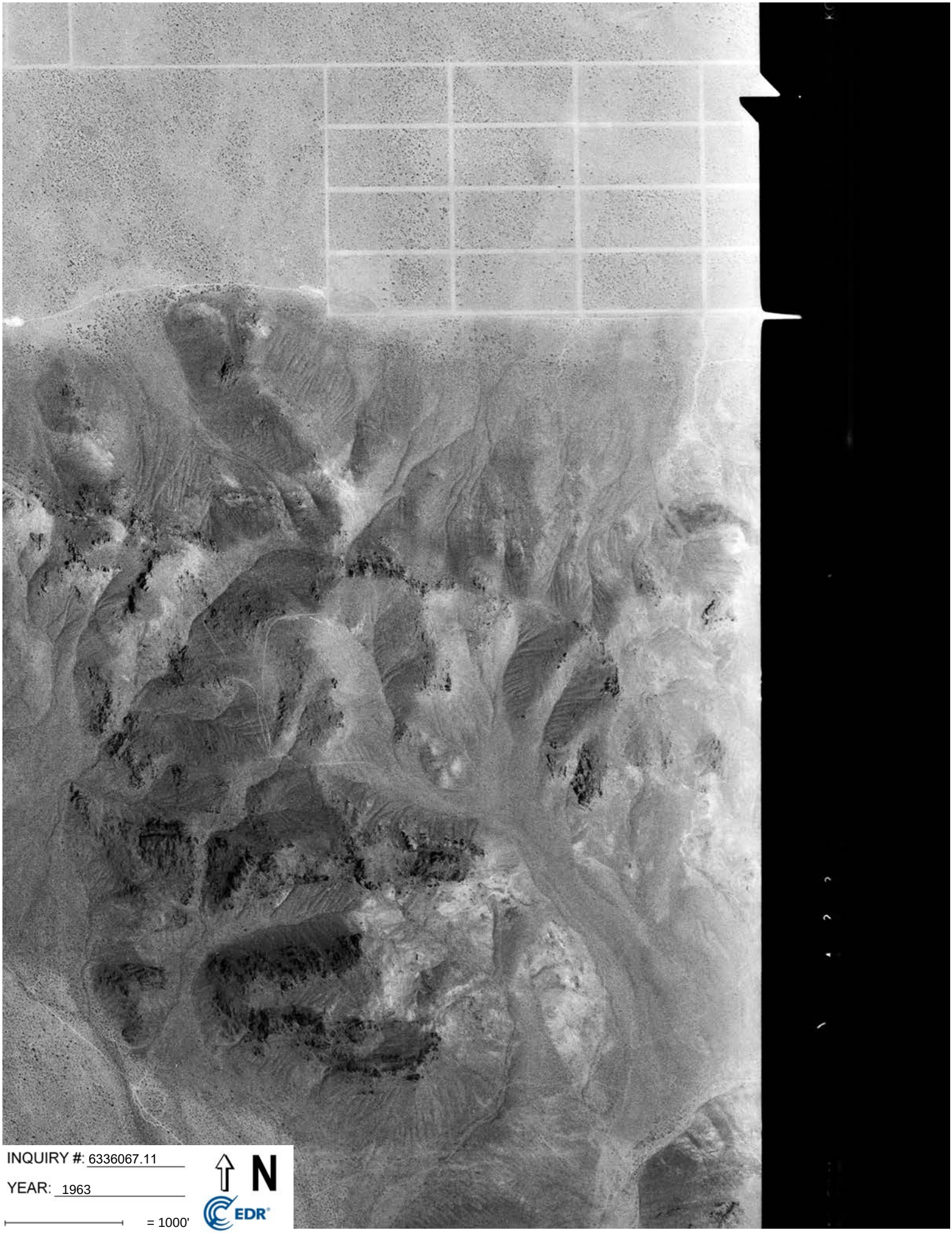
N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 6336067.11
YEAR: 1977
= 1000'
N
EDR


INQUIRY #: 6336067.11
YEAR: 1972
= 1000'
N
EDR



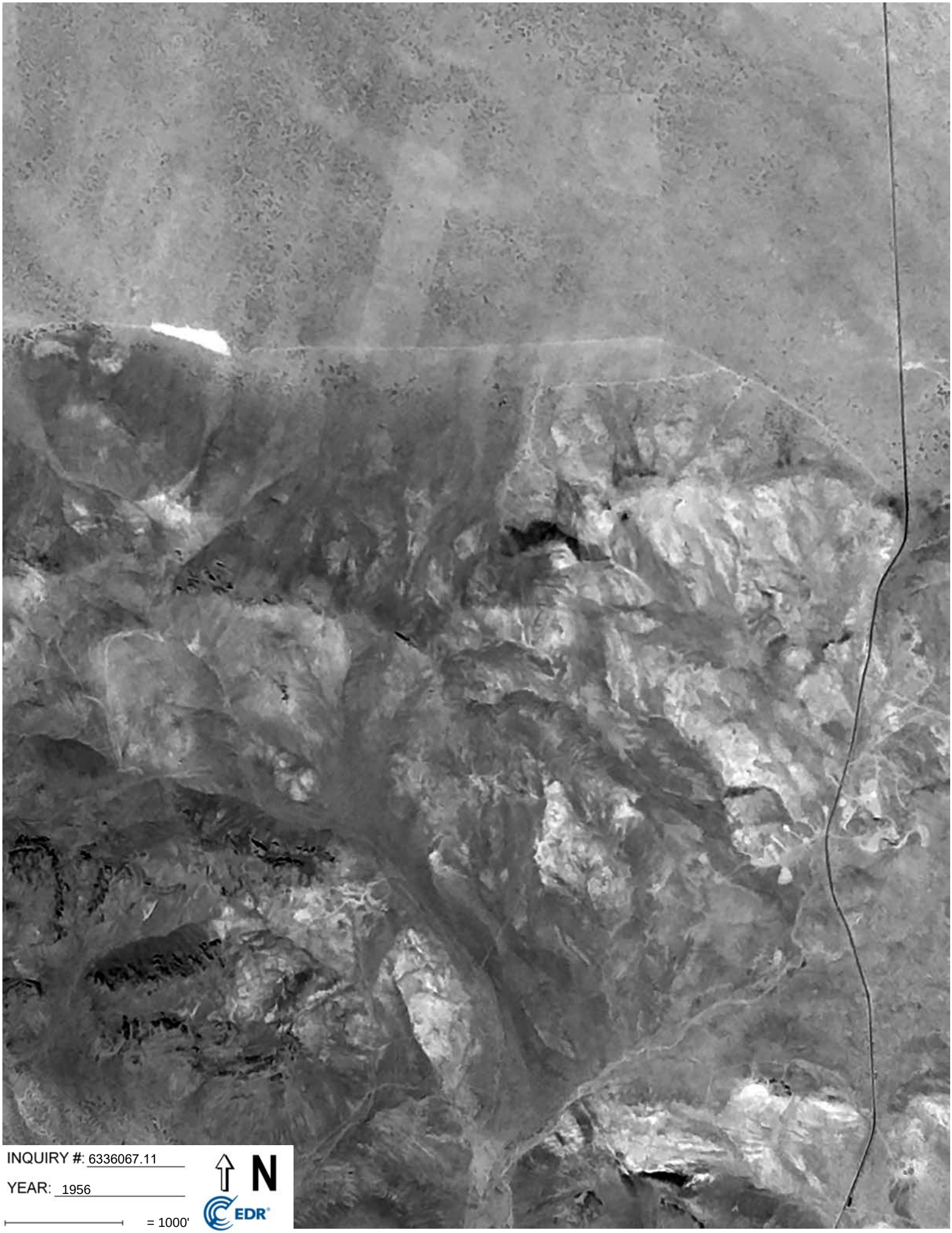
INQUIRY #: 6336067.11

YEAR: 1963

= 1000'

N

EDR



INQUIRY #: 6336067.11

YEAR: 1956

= 1000'

N

EDR

# Appendix G: Historical City Directory



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Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.
SC07360_Gem Hill Phase I ESA_Rev1.docx

**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA 93501

Inquiry Number: 6336067.5
January 20, 2021

# The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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## SECTION

**Executive Summary**

**Findings**

**City Directory Images**

***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EXECUTIVE SUMMARY

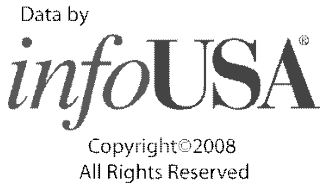
## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

## RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

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## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

| Year | Target Street | Cross Street | Source |
|---|---|---|---|
| 2017 | ☑ | ☑ | EDR Digital Archive |
| 2014 | ☑ | ☑ | EDR Digital Archive |
| 2010 | ☑ | ☑ | EDR Digital Archive |
| 2005 | ☑ | ☑ | EDR Digital Archive |
| 2000 | ☑ | ☑ | EDR Digital Archive |
| 1995 | ☑ | ☐ | EDR Digital Archive |
| 1992 | ☑ | ☑ | EDR Digital Archive |
| 1985 | ☑ | ☑ | Haines Criss-Cross Directory |
| 1980 | ☑ | ☑ | Haines Criss-Cross Directory |
| 1975 | ☐ | ☐ | Haines Criss-Cross Directory |

# FINDINGS

## TARGET PROPERTY STREET

6459 Mojave-Tropico Rd
Mojave, CA 93501

| *Year* | *CD Image* | *Source* | |
|---|---|---|---|
| **MOJAVE TROPICO RD** | | | |
| 2017 | pg A2 | EDR Digital Archive | |
| 2014 | pg A5 | EDR Digital Archive | |
| 2010 | pg A8 | EDR Digital Archive | |
| 2005 | pg A11 | EDR Digital Archive | |
| 2000 | pg A14 | EDR Digital Archive | |
| 1995 | pg A16 | EDR Digital Archive | |
| 1992 | pg A18 | EDR Digital Archive | |
| 1985 | pg A21 | Haines Criss-Cross Directory | |
| 1980 | pg A23 | Haines Criss-Cross Directory | |
| 1975 | - | Haines Criss-Cross Directory | Target and Adjoining not listed in Source |

# FINDINGS

## CROSS STREETS

| *Year* | *CD Image* | *Source* | |
|---|---|---|---|
| **50TH ST W** | | | |
| 2017 | pg. A1 | EDR Digital Archive | |
| 2014 | pg. A4 | EDR Digital Archive | |
| 2010 | pg. A7 | EDR Digital Archive | |
| 2005 | pg. A10 | EDR Digital Archive | |
| 2000 | pg. A13 | EDR Digital Archive | |
| 1995 | - | EDR Digital Archive | Target and Adjoining not listed in Source |
| 1992 | pg. A17 | EDR Digital Archive | |
| 1985 | pg. A20 | Haines Criss-Cross Directory | |
| 1980 | pg. A22 | Haines Criss-Cross Directory | |
| 1975 | - | Haines Criss-Cross Directory | Target and Adjoining not listed in Source |
| **MOJAVE TROPICO RD** | | | |
| 2017 | pg. A3 | EDR Digital Archive | |
| 2014 | pg. A6 | EDR Digital Archive | |
| 2010 | pg. A9 | EDR Digital Archive | |
| 2005 | pg. A12 | EDR Digital Archive | |
| 2000 | pg. A15 | EDR Digital Archive | |
| 1995 | - | EDR Digital Archive | Target and Adjoining not listed in Source |
| 1992 | pg. A19 | EDR Digital Archive | |

# City Directory Images

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

## 50TH ST W 2017

| | |
| --- | --- |
| 2084 | FULP, PATRICK A |
| 2358 | LOPEZ, GREGORIO |
| 2368 | AMOS, MICHAEL W |
| 3100 | REYES, AMPARO G |
| 3337 | MCKEE, RUSSELL L |
| 3484 | LOGAN, JEFFERY |
| 3701 | KIM, TAE S |
| 3812 | JANE, WILLIAMS |
| 4584 | TRUITT, HAROLD P |
| 4848 | FRENCH, ANDREW C |

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

# MOJAVE TROPICO RD 2017

| | |
|---|---|
| 3123 | WILLIAMS, BOBBY G |
| 3180 | SOUTHERN KERN UNIFIED SCHOOL DISTRIC |
| 3324 | MAXWELL, BETTY J |
| 3609 | RANDLEMAN, RICHARD A |
| 3733 | DONISI, SHELLY |
| 3759 | ROMAN, ERICA |
| 5200 | PAULEY, GIL |
| 5511 | CAMPBELL, LORRAINE |
| 5512 | PIMENTEL, FRANK |
| 7167 | CASH, TORCHY R |
| 7288 | MOORES, PHILLIP M |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLYHELEN |
| 7857 | ROMINES, GAIL C |
| 8043 | SANDENE, DAVID A |
| 8311 | HALL, WENDY M |
| 8317 | MARSILIO, STEVEN A |
| 8323 | SEGAL, PATRICK J |
| 8329 | BAIRD, MARTIN |
| 8520 | JOHNSON, SHARON |
| | JOHNSON, THOMAS S |
| 8837 | OLUFSON, DONNA D |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

# MOJAVE TROPICO RD 2017

| | |
| --- | --- |
| 3123 | WILLIAMS, BOBBY G |
| 3180 | SOUTHERN KERN UNIFIED SCHOOL DISTRIC |
| 3324 | MAXWELL, BETTY J |
| 3609 | RANDLEMAN, RICHARD A |
| 3733 | DONISI, SHELLY |
| 3759 | ROMAN, ERICA |
| 5200 | PAULEY, GIL |
| 5511 | CAMPBELL, LORRAINE |
| 5512 | PIMENTEL, FRANK |
| 7167 | CASH, TORCHY R |
| 7288 | MOORES, PHILLIP M |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLYHELEN |
| 7857 | ROMINES, GAIL C |
| 8043 | SANDENE, DAVID A |
| 8311 | HALL, WENDY M |
| 8317 | MARSILIO, STEVEN A |
| 8323 | SEGAL, PATRICK J |
| 8329 | BAIRD, MARTIN |
| 8520 | JOHNSON, SHARON |
| | JOHNSON, THOMAS S |
| 8837 | OLUFSON, DONNA D |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | EDR Digital Archive |

## 50TH ST W 2014

| | |
|---|---|
| 2084 | FULP, PATRICK A |
| 2224 | BROWN, SHERRI L |
| 2358 | OCCUPANT UNKNOWN, |
| 2362 | OCCUPANT UNKNOWN, |
| 2368 | AMOS, MICHAEL W |
| 2990 | HARDING, ROBERT J |
| 3100 | GLORIA, AMPARO |
| 3337 | MCKEE, RUSSELL L |
| 3383 | OCCUPANT UNKNOWN, |
| 3484 | CASE, KELLY M |
| 3647 | OCCUPANT UNKNOWN, |
| 3701 | KIM, TAE S |
| 3812 | JANE, WILLIAMS |
| 4584 | TRUITT, JAMES P |
| 4848 | PADILLA, DENNIS D |
| 4854 | TRUITT, HAROLD |

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

# MOJAVE TROPICO RD 2014

| | |
|---|---|
| 3123 | WILLIAMS, BOBBY G |
| 3180 | DECAPRIO, DENA |
| | SOUTHERN KERN UNIFIED SCHOOL DISTRIC |
| | TROPICO MIDDLE SCHOOL |
| 3201 | SANCHEZ, YOLANDA Y |
| 3324 | MAXWELL, BETTY J |
| 3478 | FERGUSON, MICHAEL J |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | SHINGLEDECKE, DAWANNA |
| 3737 | DAVIS, JAMES G |
| 3759 | ROMAN, ERICA |
| 5200 | SHELTON, EDWARD W |
| 5511 | CAMPBELL, LORRAINE |
| 5512 | PIMENTEL, FRANK |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, TORCHY R |
| 7288 | SAFRANEK, ALYCE L |
| 7358 | MILHORN, CHRISTINA |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLYHELEN |
| 7857 | ROMINES, GAIL C |
| 8010 | OCCUPANT UNKNOWN, |
| 8025 | OCCUPANT UNKNOWN, |
| 8311 | OCCUPANT UNKNOWN, |
| 8317 | KILBY, RICHARD A |
| 8323 | SEGAL, MICHAEL C |
| 8329 | FEINBERG, STEPHEN |
| 8584 | BEATRICE, STEPHEN |
| 8630 | OCCUPANT UNKNOWN, |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | ROBERTS, JEFF A |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | EDR Digital Archive |

# MOJAVE TROPICO RD 2014

| | |
|---|---|
| 3123 | WILLIAMS, BOBBY G |
| 3180 | DECAPRIO, DENA |
| | SOUTHERN KERN UNIFIED SCHOOL DISTRIC |
| | TROPICO MIDDLE SCHOOL |
| 3201 | SANCHEZ, YOLANDA Y |
| 3324 | MAXWELL, BETTY J |
| 3478 | FERGUSON, MICHAEL J |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | SHINGLEDECKE, DAWANNA |
| 3737 | DAVIS, JAMES G |
| 3759 | ROMAN, ERICA |
| 5200 | SHELTON, EDWARD W |
| 5511 | CAMPBELL, LORRAINE |
| 5512 | PIMENTEL, FRANK |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, TORCHY R |
| 7288 | SAFRANEK, ALYCE L |
| 7358 | MILHORN, CHRISTINA |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLYHELEN |
| 7857 | ROMINES, GAIL C |
| 8010 | OCCUPANT UNKNOWN, |
| 8025 | OCCUPANT UNKNOWN, |
| 8311 | OCCUPANT UNKNOWN, |
| 8317 | KILBY, RICHARD A |
| 8323 | SEGAL, MICHAEL C |
| 8329 | FEINBERG, STEPHEN |
| 8584 | BEATRICE, STEPHEN |
| 8630 | OCCUPANT UNKNOWN, |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | ROBERTS, JEFF A |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | EDR Digital Archive |

## 50TH ST W 2010

| | |
|---|---|
| 2224 | ADAM, SHIRLEY A |
| 2358 | OCCUPANT UNKNOWN, |
| 2368 | AMOS, MICHAEL W |
| 3100 | HIT 4 POWER PRO BASEBALL |
| | YOUNG, ERIC S |
| 3322 | SPOOR, DAN J |
| 3337 | MCKEE, RUSSELL L |
| 3379 | TALLEY, TIM W |
| 3383 | EPPICH, TIMOTHY D |
| 3484 | CASE, KELLY M |
| 3647 | OCCUPANT UNKNOWN, |
| 3701 | NORMAN, G |
| 3812 | WILLIAMS, JANE |
| 4584 | TRUITT, HAROLD P |
| 4848 | SMITH, GERALD C |

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

# MOJAVE TROPICO RD 2010

| | |
|---|---|
| 3123 | WILLIAMS, BOBBY G |
| 3201 | SANCHEZ, SALVADOR |
| 3324 | OCCUPANT UNKNOWN, |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | OCCUPANT UNKNOWN, |
| 3737 | DAVIS, JAMES G |
| 3759 | HAYDEN, SCOTTY |
| 5200 | SHELTON, EDWARD W |
| 5512 | DANEL, BETTIE |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, TORCHY R |
| 7288 | SAFRANEK, WILLIAM R |
| 7358 | MILHORN, CHRISTINA |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLY S |
| 7857 | BRAUN, CHARLES A |
| 8010 | OCCUPANT UNKNOWN, |
| 8025 | OCCUPANT UNKNOWN, |
| 8043 | SANDENE, PATRICIA A |
| 8311 | HAINES, MARYBETH A |
| 8317 | KILBY, RICHARD A |
| 8323 | BRUNK, ERIN |
| 8329 | FEINBERG, STEPHEN |
| 8520 | JOHNSON, THOMAS S |
| 8584 | BEATRICE, STEPHEN |
| 8630 | BOLANOS, RAMIRO |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | ROBERTS, JEFF A |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

# MOJAVE TROPICO RD 2010

| | |
| --- | --- |
| 3123 | WILLIAMS, BOBBY G |
| 3201 | SANCHEZ, SALVADOR |
| 3324 | OCCUPANT UNKNOWN, |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | OCCUPANT UNKNOWN, |
| 3737 | DAVIS, JAMES G |
| 3759 | HAYDEN, SCOTTY |
| 5200 | SHELTON, EDWARD W |
| 5512 | DANEL, BETTIE |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, TORCHY R |
| 7288 | SAFRANEK, WILLIAM R |
| 7358 | MILHORN, CHRISTINA |
| 7494 | MILLER, PATRICIA A |
| 7830 | CLARK, GREGORY L |
| 7850 | HERNANDEZ, BILLY S |
| 7857 | BRAUN, CHARLES A |
| 8010 | OCCUPANT UNKNOWN, |
| 8025 | OCCUPANT UNKNOWN, |
| 8043 | SANDENE, PATRICIA A |
| 8311 | HAINES, MARYBETH A |
| 8317 | KILBY, RICHARD A |
| 8323 | BRUNK, ERIN |
| 8329 | FEINBERG, STEPHEN |
| 8520 | JOHNSON, THOMAS S |
| 8584 | BEATRICE, STEPHEN |
| 8630 | BOLANOS, RAMIRO |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | ROBERTS, JEFF A |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | EDR Digital Archive |

## 50TH ST W 2005

| | |
|---|---|
| 2224 | ADAM, SHIRLEY A |
| 2990 | FLORES, AURELIO |
| 3100 | HIT 4 POWER PROFESSIONAL BASEBALL SC |
| | YOUNG, SELWYN L |
| 3322 | SPOOR, DANIEL L |
| 3337 | MCKEE, RUSSELL L |
| 3379 | LANDSGAARD, DANIEL |
| 3383 | EPPICH, TIMOTHY D |
| 3813 | OCCUPANT UNKNOWN, |
| 4584 | CACTUS KATE MEDIA |
| | TRUITT, HAROLD P |
| 4848 | SMITH, GERALD C |

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

# MOJAVE TROPICO RD 2005

| | |
|---|---|
| 3123 | WILLIAMS, RUSSELL K |
| 3180 | TROPICO MIDDLE SCHOOL |
| 3201 | SANCHEZ, SALVADOR |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | OUDTHONE, DYLLAN |
| 3737 | DAVIS, JAMES G |
| 3759 | URRUTIA, NORMA L |
| 5200 | SHELTON, EDWARD W |
| 5512 | OCCUPANT UNKNOWN, |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, CARL L |
| 7288 | GIGUERE, TIM R |
| 7494 | MILLER, RUSSELL K |
| 7830 | COLEMAN, SHAWN |
| 7850 | HERNANDEZ, BILLY S |
| 7857 | BRAUN, CHARLES A |
| 8025 | OCCUPANT UNKNOWN, |
| 8601 | WOMACK, PAUL C |
| 8630 | BOLANOS, RAMIRO |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | OCCUPANT UNKNOWN, |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

# MOJAVE TROPICO RD 2005

| | |
| --- | --- |
| 3123 | WILLIAMS, RUSSELL K |
| 3180 | TROPICO MIDDLE SCHOOL |
| 3201 | SANCHEZ, SALVADOR |
| 3545 | LEFTWICH, THOMAS E |
| 3733 | OUDTHONE, DYLLAN |
| 3737 | DAVIS, JAMES G |
| 3759 | URRUTIA, NORMA L |
| 5200 | SHELTON, EDWARD W |
| 5512 | OCCUPANT UNKNOWN, |
| 7152 | OCCUPANT UNKNOWN, |
| 7167 | CASH, CARL L |
| 7288 | GIGUERE, TIM R |
| 7494 | MILLER, RUSSELL K |
| 7830 | COLEMAN, SHAWN |
| 7850 | HERNANDEZ, BILLY S |
| 7857 | BRAUN, CHARLES A |
| 8025 | OCCUPANT UNKNOWN, |
| 8601 | WOMACK, PAUL C |
| 8630 | BOLANOS, RAMIRO |
| 8749 | DENNY, CALVIN R |
| 8759 | OCCUPANT UNKNOWN, |
| 8837 | OCCUPANT UNKNOWN, |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

## 50TH ST W 2000

3337 MCKEE, RUSSELL L
3383 EPPICH, T D

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

# MOJAVE TROPICO RD 2000

| | |
|---|---|
| 3123 | RATZLAFF, MELVIN E |
| 3180 | TROPICO MIDDLE SCHOOL |
| 3545 | LEFTWICH, THOMAS E |
| 3737 | DAVIS, JAMES G |
| 7152 | CANTU, MARTHA L |
| | CANTU, MARTHA L |
| 7167 | CASH, CARL L |
| | CASH, CARL L |
| 7494 | MILLER, RUSSELL K |
| | MILLER, RUSSELL K |
| 7830 | OCCUPANT UNKNOWN, |
| | OCCUPANT UNKNOWN, |
| 7850 | HELVER, PAUL |
| | HELVER, PAUL |
| 7857 | LOPEZ, ANNA |
| | LOPEZ, ANNA |
| 8010 | BUCHANAN, LARRY |
| | BUCHANAN, LARRY |
| 8025 | OCCUPANT UNKNOWN, |
| 8584 | LEFTWICH, L |
| 8601 | NEVERS, WILLIAM E |
| 8749 | DENNY, ROBERT |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | EDR Digital Archive |

# MOJAVE TROPICO RD 2000

| | |
|---|---|
| 3123 | RATZLAFF, MELVIN E |
| 3180 | TROPICO MIDDLE SCHOOL |
| 3545 | LEFTWICH, THOMAS E |
| 3737 | DAVIS, JAMES G |
| 7152 | CANTU, MARTHA L |
| | CANTU, MARTHA L |
| 7167 | CASH, CARL L |
| | CASH, CARL L |
| 7494 | MILLER, RUSSELL K |
| | MILLER, RUSSELL K |
| 7830 | OCCUPANT UNKNOWN, |
| | OCCUPANT UNKNOWN, |
| 7850 | HELVER, PAUL |
| | HELVER, PAUL |
| 7857 | LOPEZ, ANNA |
| | LOPEZ, ANNA |
| 8010 | BUCHANAN, LARRY |
| | BUCHANAN, LARRY |
| 8025 | OCCUPANT UNKNOWN, |
| 8584 | LEFTWICH, L |
| 8601 | NEVERS, WILLIAM E |
| 8749 | DENNY, ROBERT |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| ✓ | - | EDR Digital Archive |

## MOJAVE TROPICO RD 1995

3752 POCHMARA, GARY

| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

## 50TH ST W 1992

3383 EPPICH, T D

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | EDR Digital Archive |

## MOJAVE TROPICO RD 1992

3180 KIRKWOOD DYNAELEC
MCLAUGHLIN CONSTR
TROPICO ELEM SC
3752 POCHMARA, GARY
7857 LOPEZ, ANNA
8025 MONROE, J L
8520 HERNANDEZ, ALMA
8749 DENNY, ROBERT

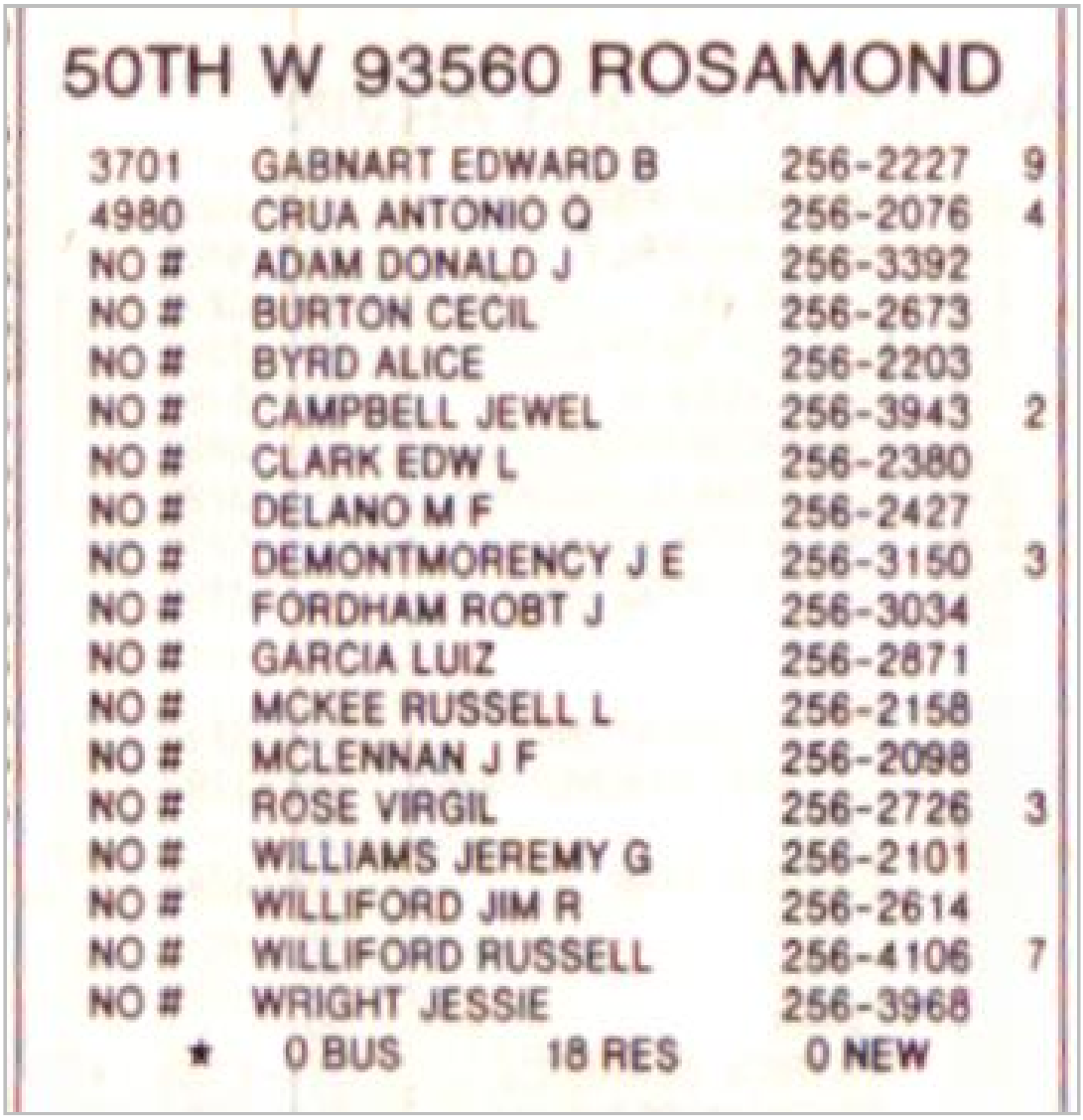
| Target Street | Cross Street | Source |
| --- | --- | --- |
| - | ✓ | EDR Digital Archive |

## MOJAVE TROPICO RD 1992

| | |
| --- | --- |
| 3180 | KIRKWOOD DYNAELEC |
| | MCLAUGHLIN CONSTR |
| | TROPICO ELEM SC |
| 3752 | POCHMARA, GARY |
| 7857 | LOPEZ, ANNA |
| 8025 | MONROE, J L |
| 8520 | HERNANDEZ, ALMA |
| 8749 | DENNY, ROBERT |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

## 50TH ST W 1985



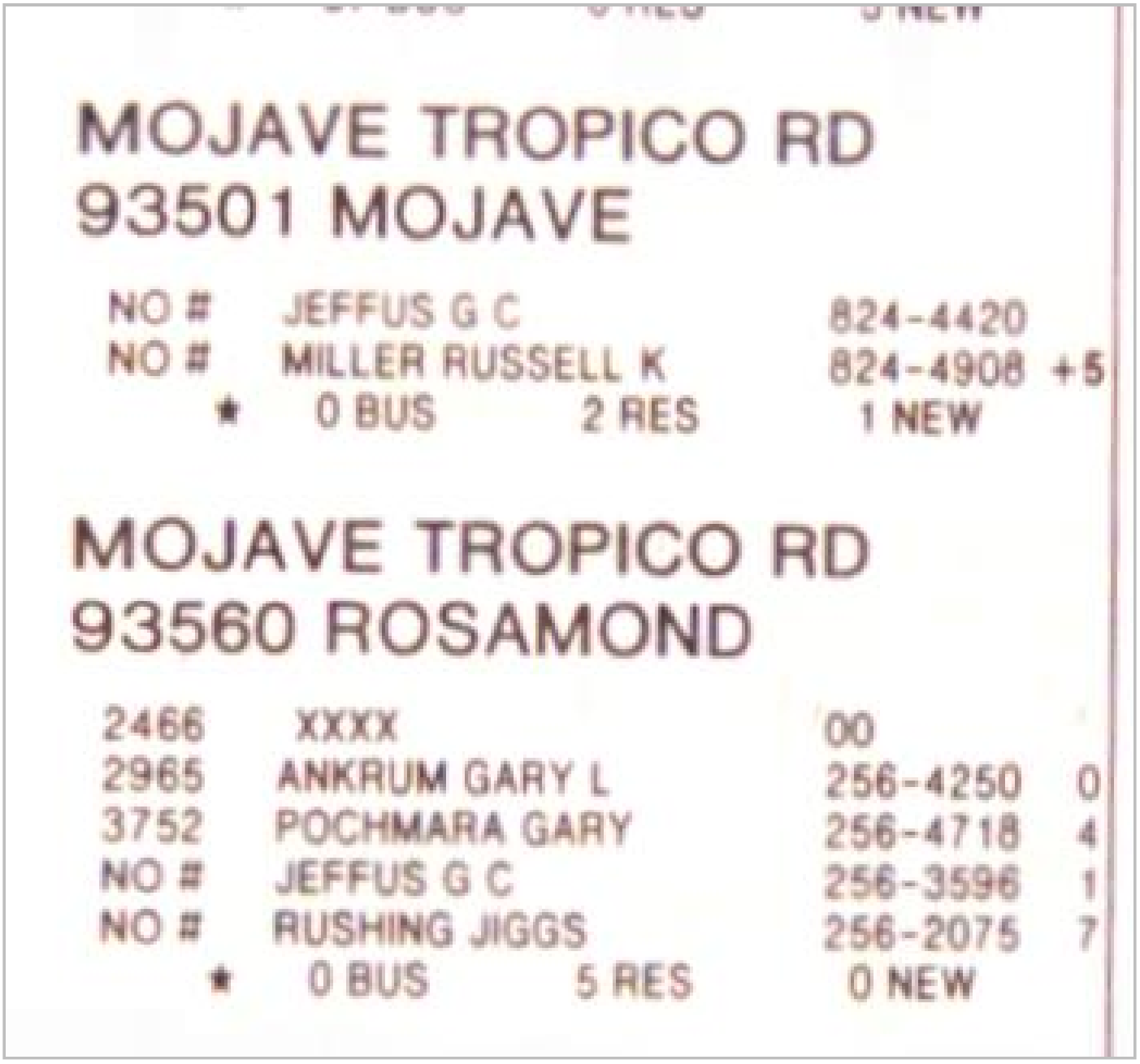
50TH W 93560 ROSAMOND

| | | | |
|---|---|---|---|
| 3701 | GABNART EDWARD B | 256-2227 | 9 |
| 4980 | CRUA ANTONIO Q | 256-2076 | 4 |
| NO # | ADAM DONALD J | 256-3392 | |
| NO # | BURTON CECIL | 256-2673 | |
| NO # | BYRD ALICE | 256-2203 | |
| NO # | CAMPBELL JEWEL | 256-3943 | 2 |
| NO # | CLARK EDW L | 256-2380 | |
| NO # | DELANO M F | 256-2427 | |
| NO # | DEMONTMORENCY J E | 256-3150 | 3 |
| NO # | FORDHAM ROBT J | 256-3034 | |
| NO # | GARCIA LUIZ | 256-2871 | |
| NO # | MCKEE RUSSELL L | 256-2158 | |
| NO # | MCLENNAN J F | 256-2098 | |
| NO # | ROSE VIRGIL | 256-2726 | 3 |
| NO # | WILLIAMS JEREMY G | 256-2101 | |
| NO # | WILLIFORD JIM R | 256-2614 | |
| NO # | WILLIFORD RUSSELL | 256-4106 | 7 |
| NO # | WRIGHT JESSIE | 256-3968 | |

★ 0 BUS 18 RES 0 NEW

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | Haines Criss-Cross Directory |

**MOJAVE TROPICO RD 1985**



MOJAVE TROPICO RD
93501 MOJAVE

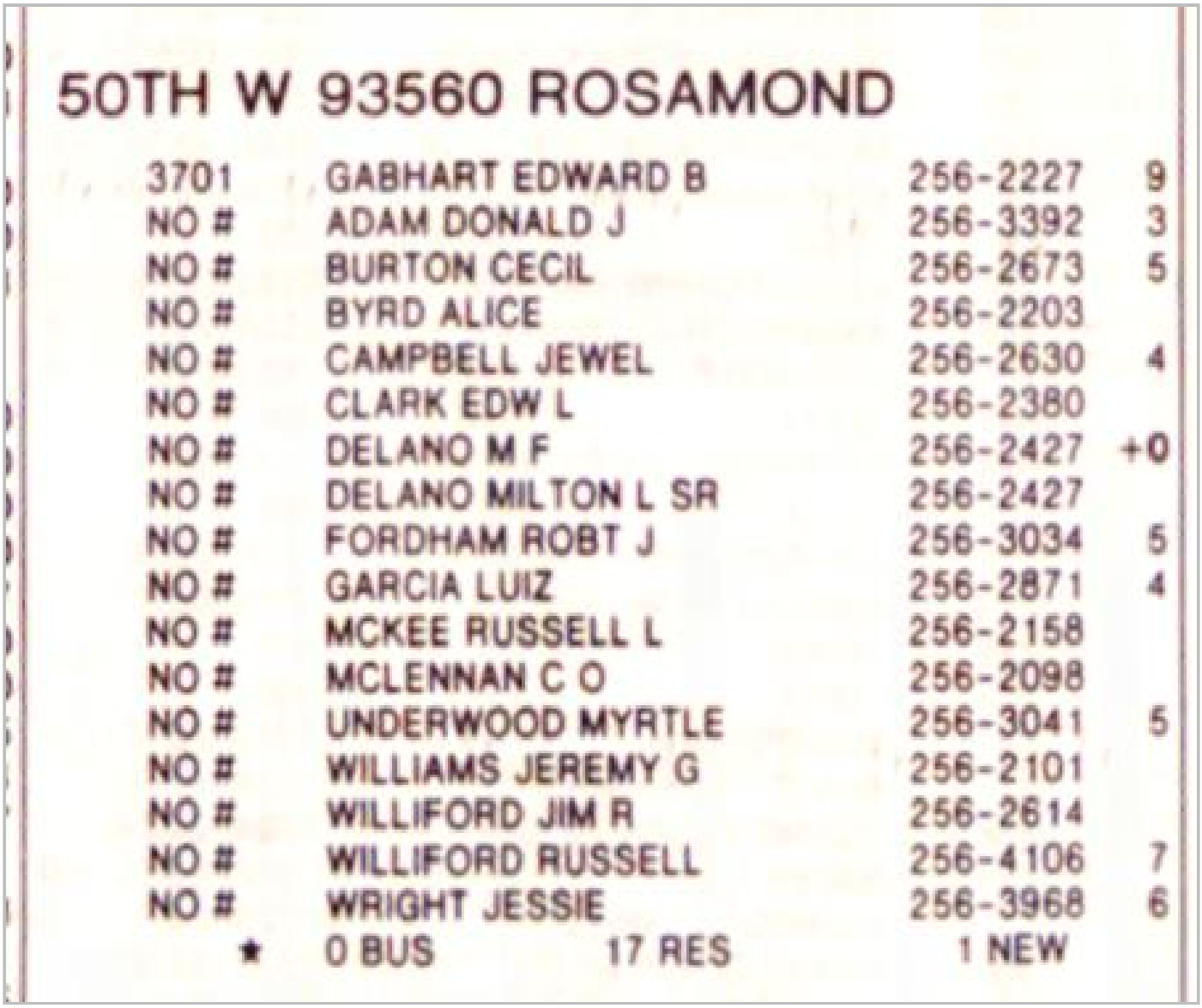
| | | | |
|---|---|---|---|
| NO # | JEFFUS G C | 824-4420 | |
| NO # | MILLER RUSSELL K | 824-4908 | +5 |
| * | 0 BUS 2 RES | 1 NEW | |

MOJAVE TROPICO RD
93560 ROSAMOND

| | | | |
|---|---|---|---|
| 2466 | XXXX | 00 | |
| 2965 | ANKRUM GARY L | 256-4250 | 0 |
| 3752 | POCHMARA GARY | 256-4718 | 4 |
| NO # | JEFFUS G C | 256-3596 | 1 |
| NO # | RUSHING JIGGS | 256-2075 | 7 |
| * | 0 BUS 5 RES | 0 NEW | |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

## 50TH ST W 1980

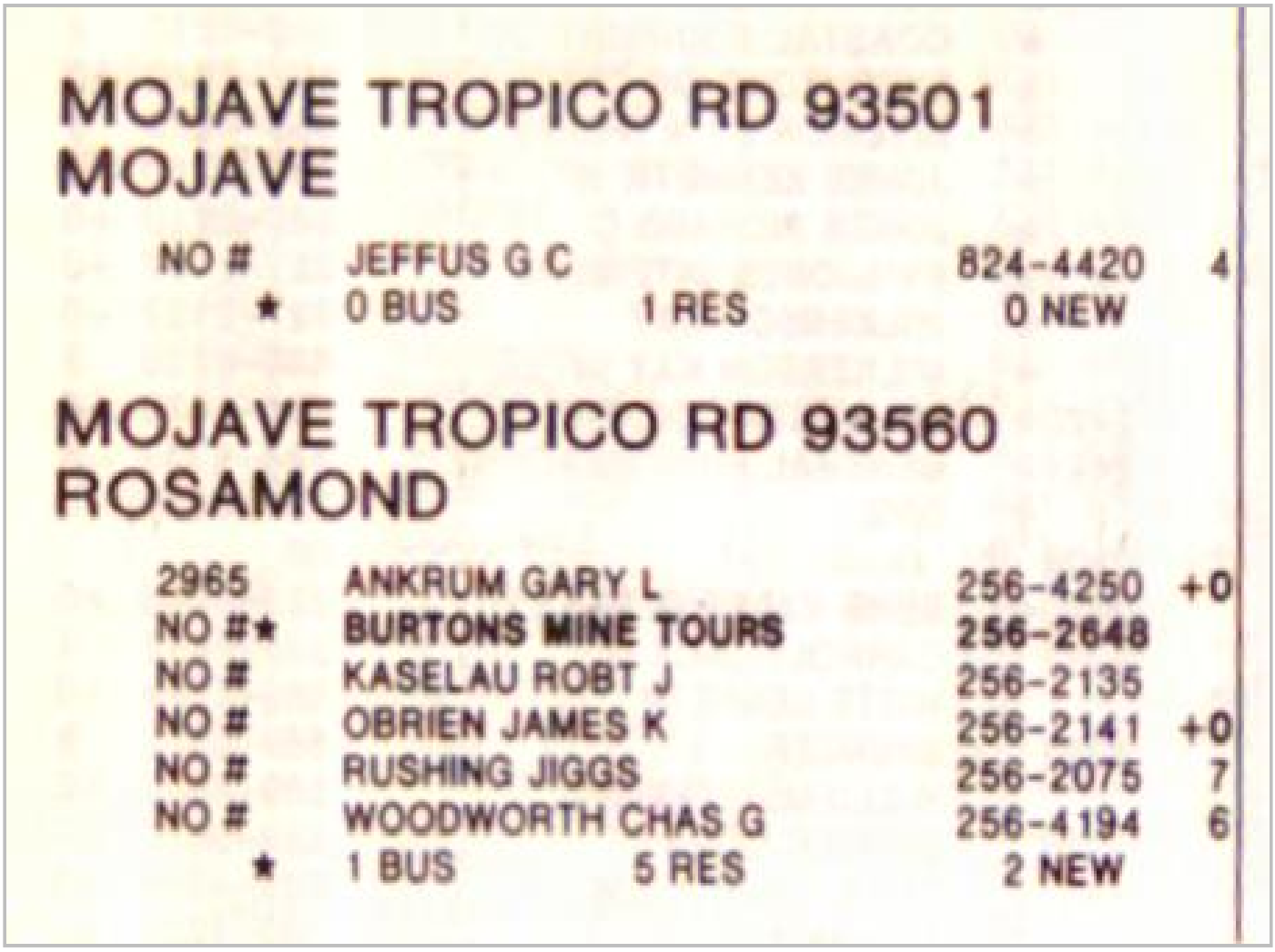


# 50TH W 93560 ROSAMOND

| | | | |
|---|---|---|---|
| 3701 | GABHART EDWARD B | 256-2227 | 9 |
| NO # | ADAM DONALD J | 256-3392 | 3 |
| NO # | BURTON CECIL | 256-2673 | 5 |
| NO # | BYRD ALICE | 256-2203 | |
| NO # | CAMPBELL JEWEL | 256-2630 | 4 |
| NO # | CLARK EDW L | 256-2380 | |
| NO # | DELANO M F | 256-2427 | +0 |
| NO # | DELANO MILTON L SR | 256-2427 | |
| NO # | FORDHAM ROBT J | 256-3034 | 5 |
| NO # | GARCIA LUIZ | 256-2871 | 4 |
| NO # | MCKEE RUSSELL L | 256-2158 | |
| NO # | MCLENNAN C O | 256-2098 | |
| NO # | UNDERWOOD MYRTLE | 256-3041 | 5 |
| NO # | WILLIAMS JEREMY G | 256-2101 | |
| NO # | WILLIFORD JIM R | 256-2614 | |
| NO # | WILLIFORD RUSSELL | 256-4106 | 7 |
| NO # | WRIGHT JESSIE | 256-3968 | 6 |
| * | 0 BUS 17 RES | 1 NEW | |

| Target Street | Cross Street | Source |
|---|---|---|
| ✓ | - | Haines Criss-Cross Directory |

## MOJAVE TROPICO RD 1980



MOJAVE TROPICO RD 93501
MOJAVE

| | | | |
|---|---|---|---|
| NO # | JEFFUS G C | 824-4420 | 4 |
| * | 0 BUS 1 RES | 0 NEW | |

MOJAVE TROPICO RD 93560
ROSAMOND

| | | | |
|---|---|---|---|
| 2965 | ANKRUM GARY L | 256-4250 | +0 |
| NO #* | BURTONS MINE TOURS | 256-2648 | |
| NO # | KASELAU ROBT J | 256-2135 | |
| NO # | OBRIEN JAMES K | 256-2141 | +0 |
| NO # | RUSHING JIGGS | 256-2075 | 7 |
| NO # | WOODWORTH CHAS G | 256-4194 | 6 |
| * | 1 BUS 5 RES | 2 NEW | |

# Appendix H: Historical Topographic Maps



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Gem Hill

6459 Mojave-Tropico Rd

Mojave, CA 93501

Inquiry Number: 6336067.4

January 20, 2021

# EDR Historical Topo Map Report

## with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Historical Topo Map Report

01/20/21

| Site Name: | Client Name: |
|---|---|
| Gem Hill | Brown & Caldwell Consultants |
| 6459 Mojave-Tropico Rd | 9665 Chesapeake Drive |
| Mojave, CA 93501 | San Diego, CA 92123 |
| EDR Inquiry # 6336067.4 | Contact: Corey Strauss |

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Brown & Caldwell Consultants were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

| *Search Results:* | | *Coordinates:* | |
|---|---|---|---|
| **P.O.#** | 061032.003 | **Latitude:** | 34.92178 34° 55' 18" North |
| **Project:** | CalPortland Kern Cty Phase 1 | **Longitude:** | -118.2269 -118° 13' 37" West |
| | | **UTM Zone:** | Zone 11 North |
| | | **UTM X Meters:** | 387933.93 |
| | | **UTM Y Meters:** | 3865055.75 |
| | | **Elevation:** | 2946.72' above sea level |

**Maps Provided:**

2012
1973, 1974
1956
1947
1943
1917
1915

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## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 2012 Source Sheets



Soledad Mountain
2012
7.5-minute, 24000



Willow Springs
2012
7.5-minute, 24000

### 1973, 1974 Source Sheets



Soledad Mtn
1973
7.5-minute, 24000
Aerial Photo Revised 1972



Willow Springs
1974
7.5-minute, 24000
Aerial Photo Revised 1963

### 1956 Source Sheets



Rosamond
1956
15-minute, 62500
Aerial Photo Revised 1952

### 1947 Source Sheets



Soledad Mountain
1947
7.5-minute, 24000

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1943 Source Sheets



Rosamond
1943
15-minute, 62500



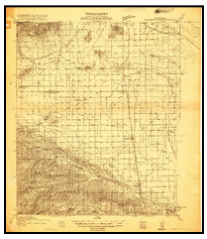
Willow Springs
1943
15-minute, 62500
Aerial Photo Revised 1943

### 1917 Source Sheets



Elizabeth Lake
1917
30-minute, 125000

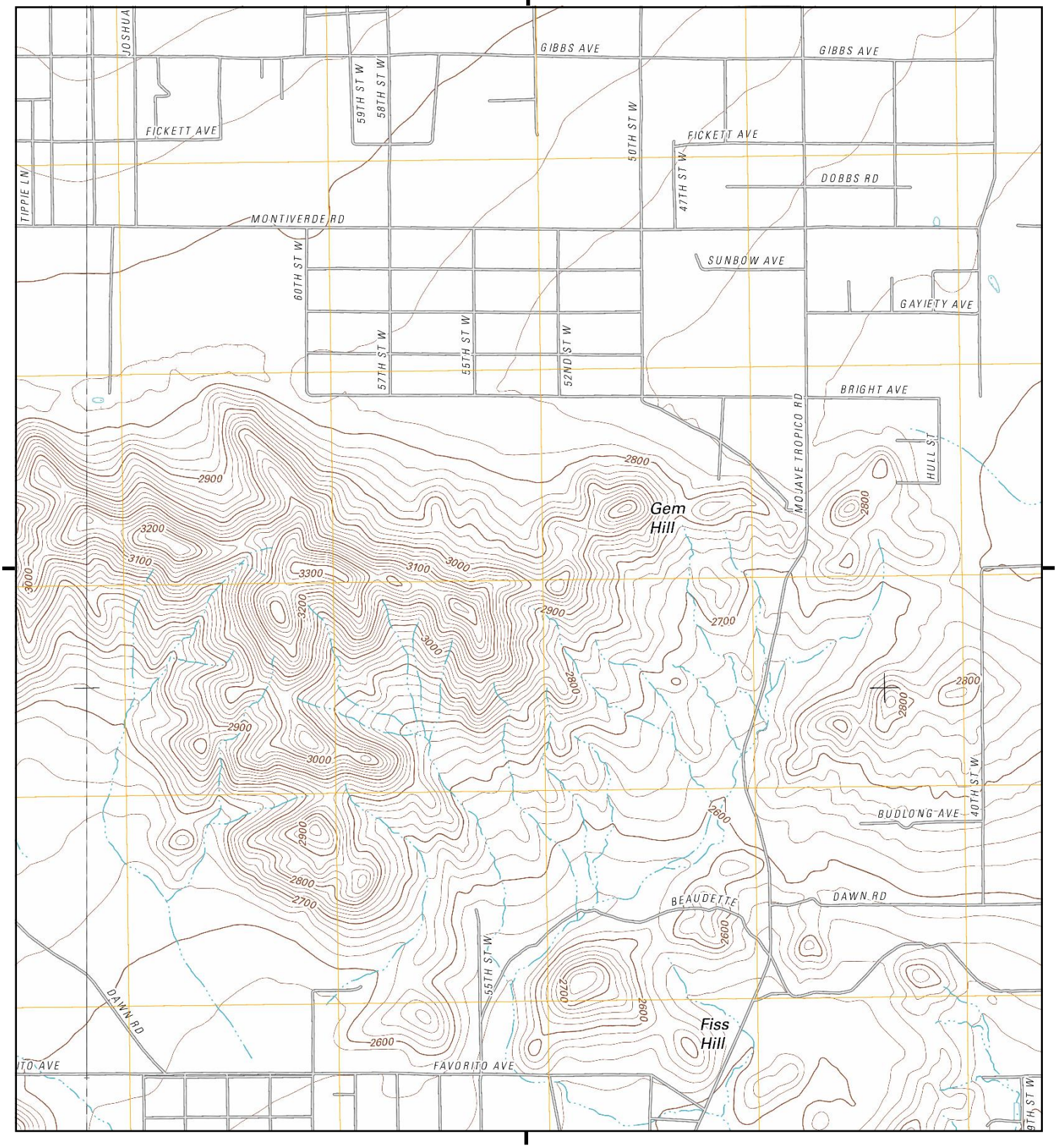
### 1915 Source Sheets



Elizabeth Lake
1915
30-minute, 96000

# Historical Topo Map

2012




This report includes information from the following map sheet(s).

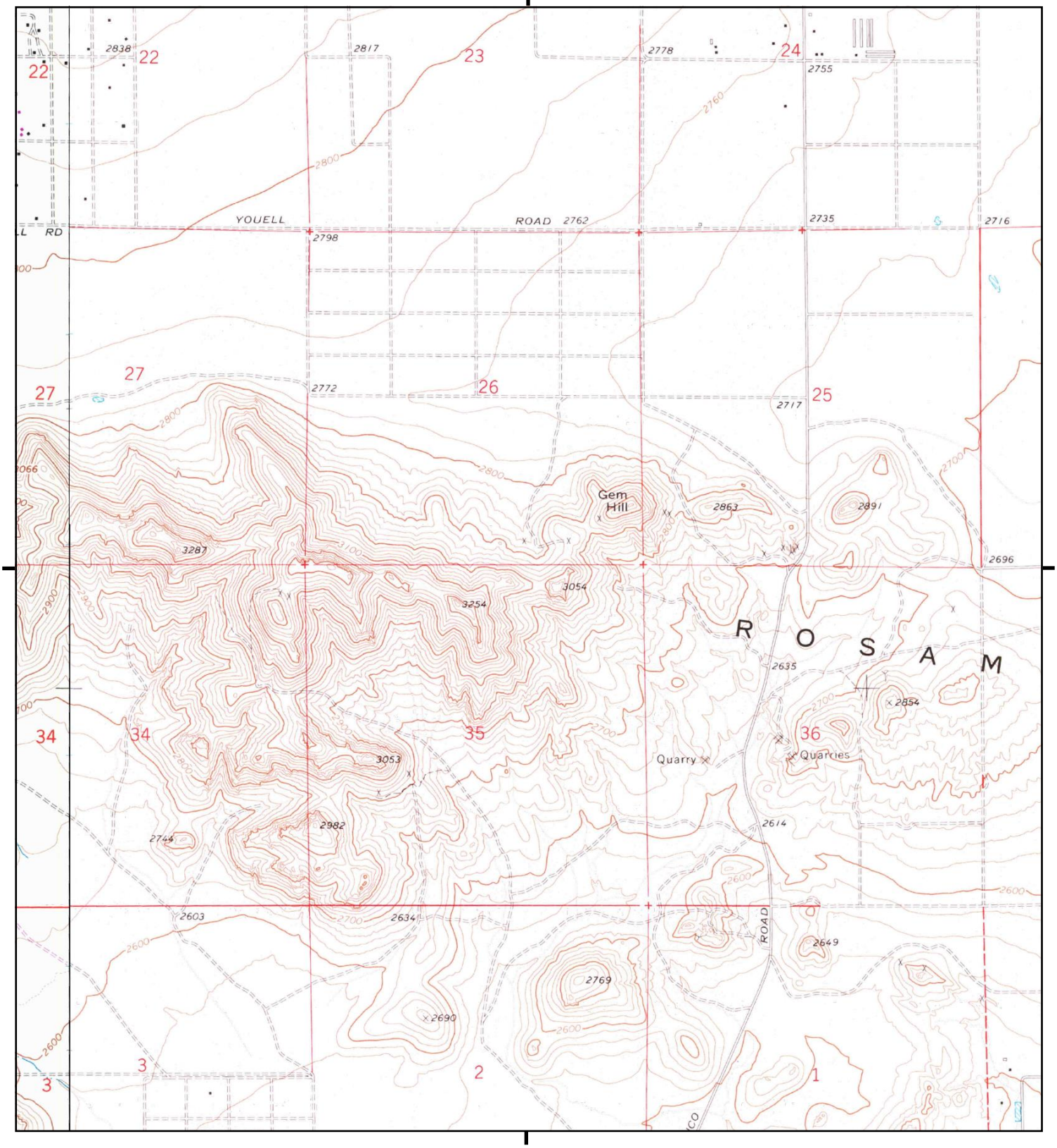
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Soledad Mountain, 2012, 7.5-minute
W, Willow Springs, 2012, 7.5-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N




This report includes information from the following map sheet(s).

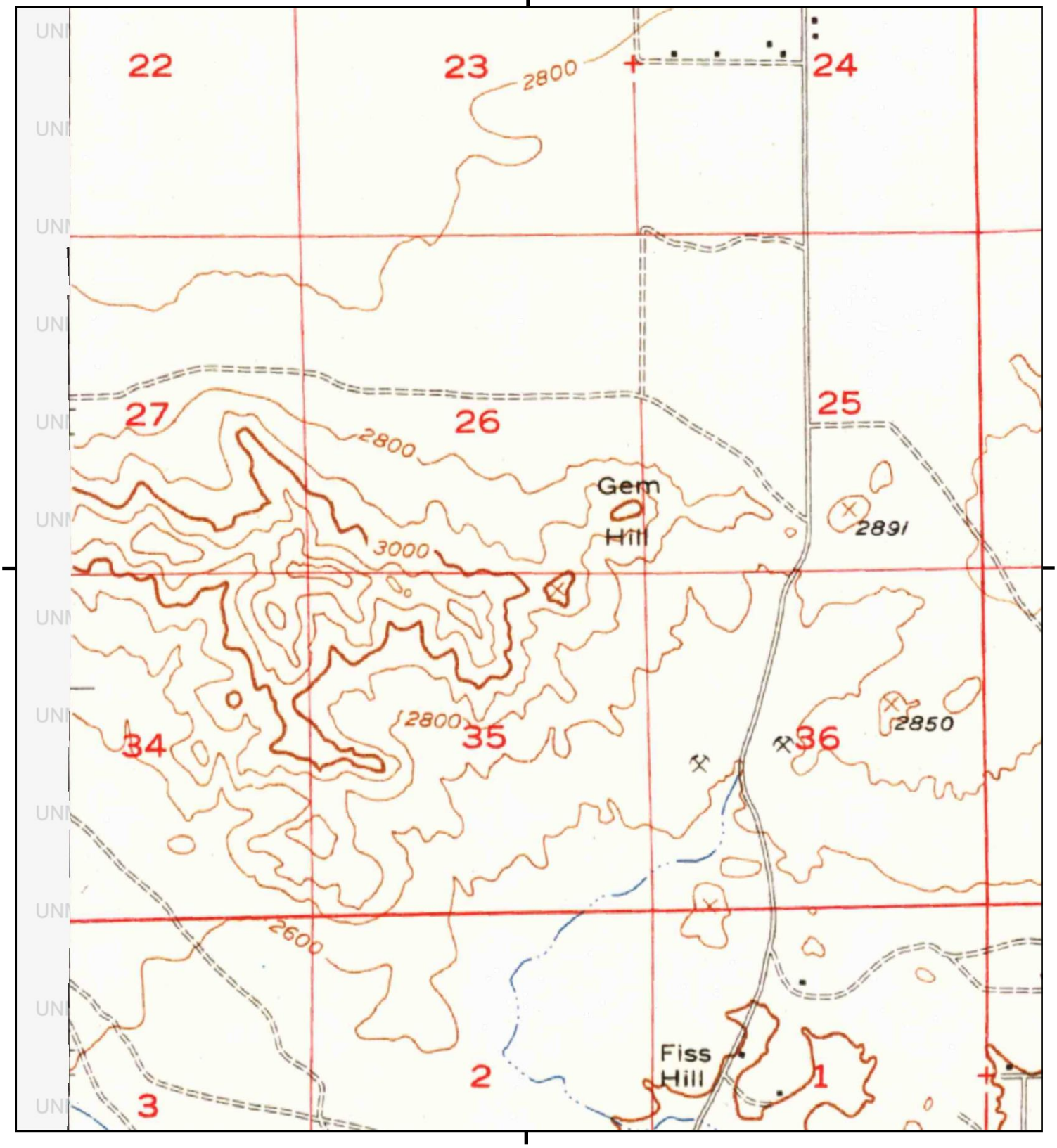
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Soledad Mtn, 1973, 7.5-minute
W, Willow Springs, 1974, 7.5-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N




This report includes information from the following map sheet(s).

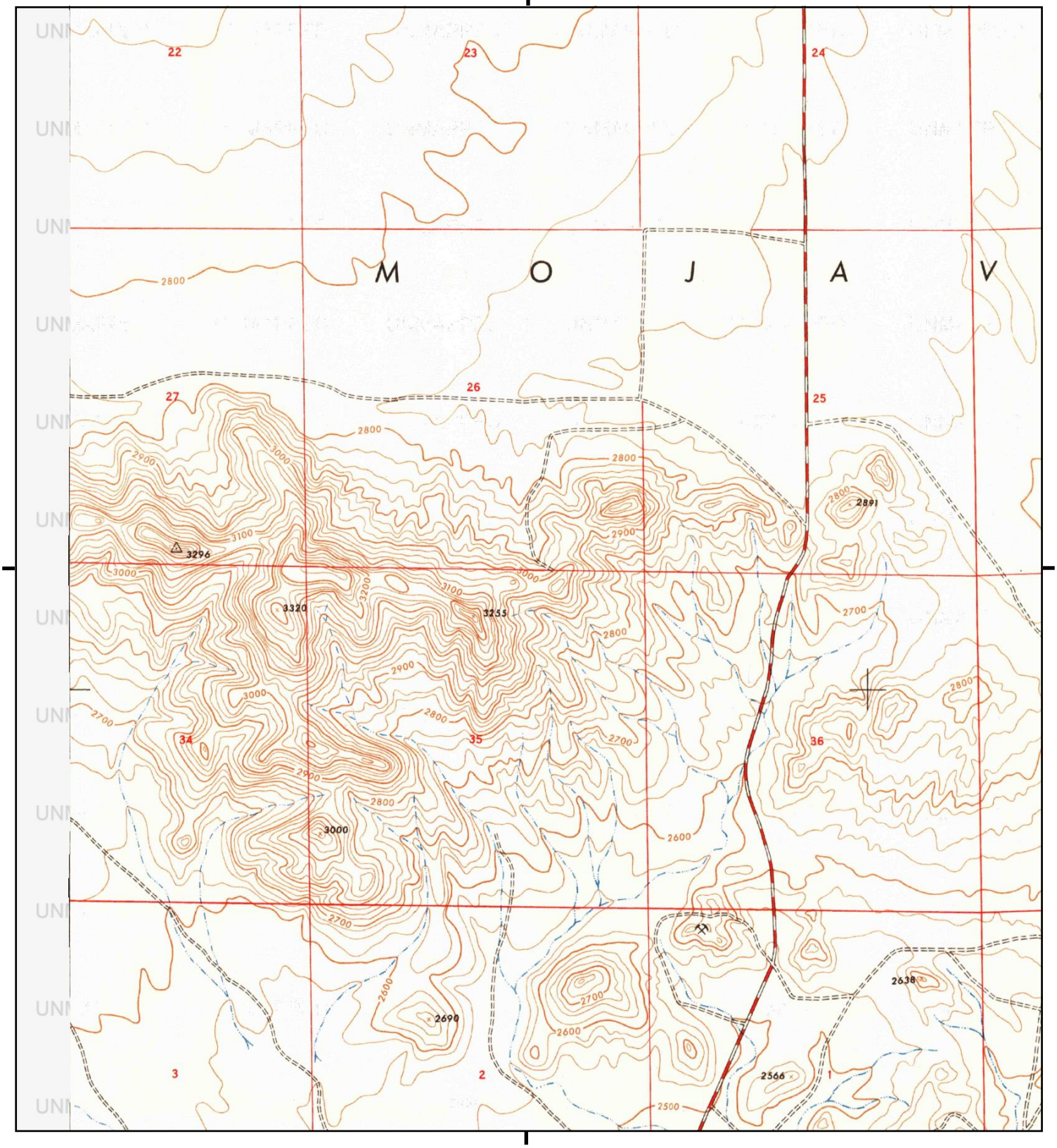
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Rosamond, 1956, 15-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N




This report includes information from the following map sheet(s).

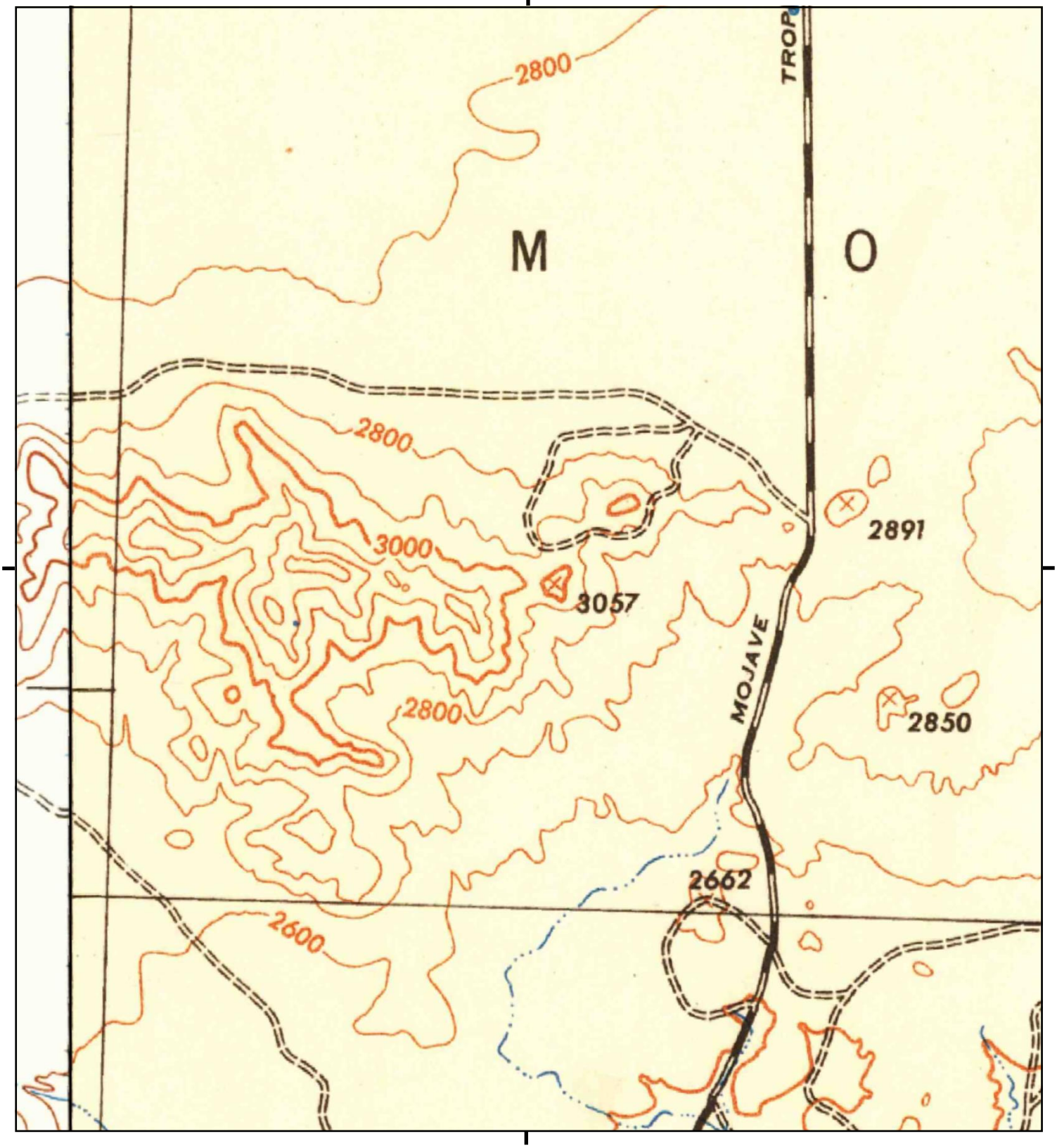
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Soledad Mountain, 1947, 7.5-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N




This report includes information from the following map sheet(s).

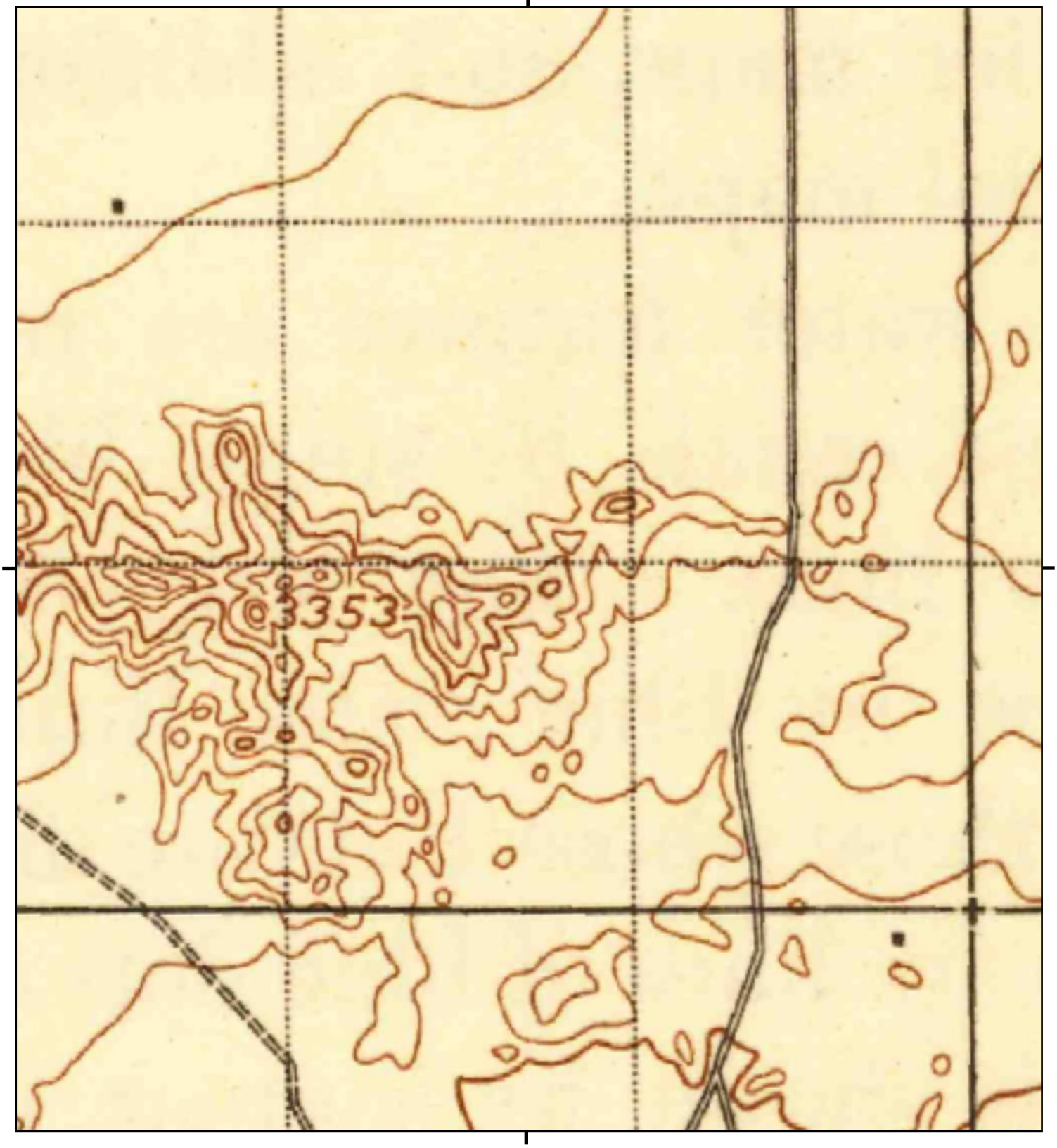
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Rosamond, 1943, 15-minute
W, Willow Springs, 1943, 15-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N




This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

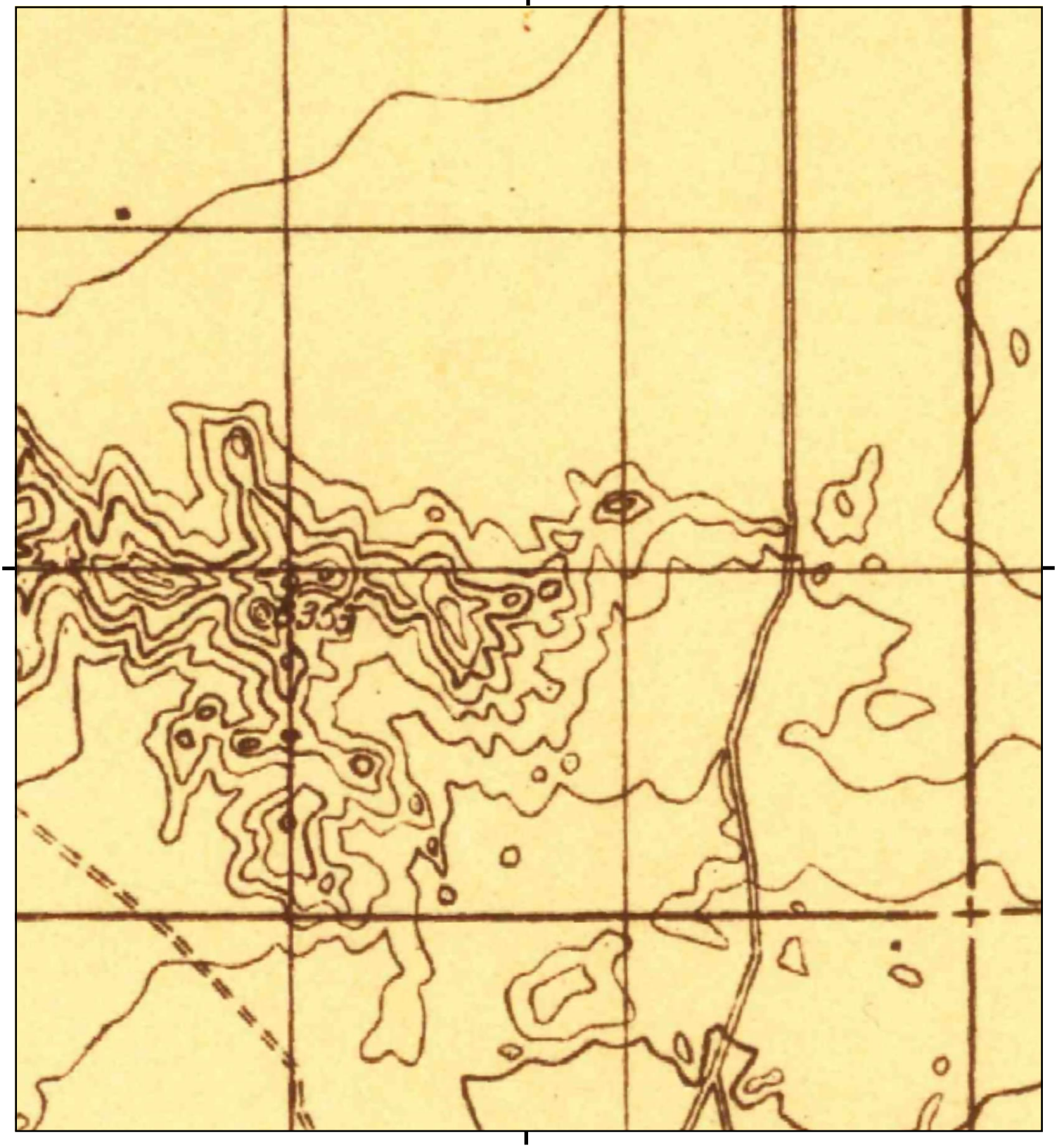
TP, Elizabeth Lake, 1917, 30-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N

# Historical Topo Map

1915



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elizabeth Lake, 1915, 30-minute

SITE NAME: Gem Hill
ADDRESS: 6459 Mojave-Tropico Rd
Mojave, CA 93501
CLIENT: Brown & Caldwell Consultants

N

# Appendix I: Sanborn or Other Fire Insurance Maps



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Gem Hill

6459 Mojave-Tropico Rd

Mojave, CA 93501

Inquiry Number: 6336067.3

January 21, 2021

# Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

01/21/21

**Site Name:**

Gem Hill
6459 Mojave-Tropico Rd
Mojave, CA 93501
EDR Inquiry # 6336067.3

**Client Name:**

Brown & Caldwell Consultants
9665 Chesapeake Drive
San Diego, CA 92123
Contact: Corey Strauss

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The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## *Certified Sanborn Results:*

**Certification #** F367-422C-8DE2

**PO #** 061032.003

**Project** CalPortland Kern Cty Phase 1

### UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: F367-422C-8DE2

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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# Appendix J: Owner Occupant Questionnaire



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SC07360_Gem Hill Phase I ESA_Rev1.docx

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

The time you take to complete this questionnaire will help Brown and Caldwell minimize the impact on your time and staff resources when we arrive onsite. Please feel free to use additional sheets if necessary. Thank you!

| SOURCE OF KNOWLEDGE CONCERNING SITE | |
|---|---|
| DATE: JANUARY 18, 2021 | |
| 1. Name of individual completing questionnaire | Alison Brewer |
| 2. Title | Environmental Specialist |
| 3. Telephone | 626-619-2459 |
| 4. Email | abrewer@calportland.com |
| 5. What is the nature of your knowledge of the Site (i.e. on-site management, staff, absentee owner, etc.)? | Staff |
| 6. When does your first-hand knowledge of the Site begin (year)? | 2020 |

| BASIC SITE INFORMATION | |
|---|---|
| 1. Site number or unique identifier, such as facility name | Gem Hill |
| 2. Site address, including zip code | 4.3 Miles north of West Rosamond Blvd. on Tropico Rd, Rosamond, CA 93560 |
| 3. Inside incorporated area of… | Not applicable |
| 4. County | Kern |
| 5. Legal description (please attach if necessary) | **Section(s):**25,26,34,35<br>**Township:** 10N<br>**Range:** 13 W San Bernardino |
| 6. Approximate size of property / building | 778.14 Acres |
| 7. Tax parcel number | 0345-294-17,0345-032-05,0345-032-31,0345-031-02 |
| 8. NAICS / SIC code | Not applicable, vacant land. |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| CURRENT SITE CONDITIONS | |
|---|---|
| 1. Who owns the Site? | CalPortland Company |
| 2. Does anyone other than the owner occupy the Site? | No |
| 3. What is the nature of the current use? | Vacant land |
| 4. When was the Site first occupied and/or developed? | The site was first developed following the grading plan approval in 2019. |
| 5. Was the Site ever occupied for the same use by a previous occupant? If so, when? | No |

| SITE FEATURES/INDICATORS OF RECOGNIZED ENVIRONMENTAL CONDITIONS | | | | |
|---|---|---|---|---|
| **To the best of your knowledge,** does the subject Site have, or has it ever had… | Please check (✓) as appropriate | | | |
| | Never had | Currently has | Formerly had | Don't know |
| 1. Underground storage tanks? | √ | | | |
| 2. Indications of a release from an underground storage tank? | √ | | | |
| 3. Above-ground storage tanks? | √ | | | |
| 4. Fuel storage and dispensing equipment? | √ | | | |
| 5. Solvent use? If so, what solvents? | √ | | | |
| 6. Ponds, pits or lagoons? | √ | | | |
| 7. A septic system? | √ | | | |
| 8. Water wells? | √ | | | |
| 9. Disposal wells? | √ | | | |
| 10. Retention basins? | √ | | | |
| 11. Paint Booth? | √ | | | |
| 12. Wash Rack or Area? | √ | | | |
| 13. Storm drains? | √ | | | |
| 14. Dry wells? | √ | | | |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| SITE FEATURES/INDICATORS OF RECOGNIZED ENVIRONMENTAL CONDITIONS | | | | |
|---|---|---|---|---|
| **To the best of your knowledge,** does the subject Site have, or has it ever had… | Please check (✓) as appropriate | | | |
| | Never had | Currently has | Formerly had | Don't know |
| 15. On-site waste treatment or disposal? | √ | | | |
| 16. Electrical transformers or other equipment potentially containing polychlorinated biphenyls (PCBs)? | √ | | | |
| 17. Stationary, in-the-ground hydraulic lifts? | √ | | | |
| 18. Fill material brought onto the Site? By whom? | √ | | | |
| 19. Pipelines carrying petroleum or hazardous materials? | √ | | | |
| 20. Oil / gas wells located at the Site | √ | | | |
| 21. Stained soil? | √ | | | |
| 22. Unusual odors? | √ | | | |
| 23. Pipes, fill ports, or access ways of unknown origin protruding from the ground? | √ | | | |
| 24. Sheen or other discoloration of surface water? | √ | | | |
| 25. Distressed vegetation (other than due to lack of water)? | √ | | | |
| 26. Does the Site accept construction debris for pit backfill? | √ | | | |
| 27. Mixing, filling, or on-site application of pesticides other than for structural treatment or sanitation? | √ | | | |
| 28. Environmental assessments or investigations? | √ | | | |
| 29. Lead-based paint? | √ | | | |
| 30. Surveys for lead-based paint? | √ | | | |
| 31. Lead abatement activities? | √ | | | |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| SITE FEATURES/INDICATORS OF RECOGNIZED ENVIRONMENTAL CONDITIONS | | | | |
|---|---|---|---|---|
| **To the best of your knowledge,** does the subject Site have, or has it ever had… | **Please check (✓) as appropriate** | | | |
| | **Never had** | **Currently has** | **Formerly had** | **Don't know** |
| 32. Asbestos-containing materials? | √ | | | |
| 33. Asbestos surveys? | √ | | | |
| 34. Asbestos abatement activities? | √ | | | |
| 35. Environmental liens against the Site? | √ | | | |
| 36. Notices of environmental violations from any regulatory agency? | √ | | | |
| 37. Any investigation by a governmental agency of potential responsibility for environmental contamination, including responsibility for off-Site concerns? | √ | | | |
| 38. Any lawsuits, disputes or administrative proceedings regarding environmental concerns associated with the Site, or activities conducted at the Site? | √ | | | |

| PREVIOUS SITE USES | | | |
|---|---|---|---|
| **To the best of your knowledge**, please identify previous uses, occupants, and dates of occupancy for the subject Site | | **Check if appropriate** | ✓ |
| • Previous occupant | Narvaez, Patamakanthin, Woolsey, and Bevacqua | Don't know | |
| • Nature of use | Vacant land | Don't know | |
| • Dates of occupancy | Prior to 2019 | Don't know | |
| • Previous occupant | | Don't know | |
| • Nature of use | | Don't know | |
| • Dates of occupancy | | Don't know | |
| • Previous occupant | | Don't know | |
| • Nature of use | | Don't know | |
| • Dates of occupancy | | Don't know | |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| ADJACENT PROPERTY USES | |
|---|---|
| **To the best of your knowledge**, please identify the business names and uses of the adjacent properties | |
| North | Vacant Land |
| East | Vacant Land |
| South | Vacant Land |
| West | Vacant Land |

| To the best of your knowledge, has the subject Site or an adjoining property ever been used as a… | Subject Site | | | Adjoining Properties (including those across the street) | | |
|---|---|---|---|---|---|---|
| | Yes | No | Don't Know | Yes | No | Don't Know |
| 1. Fueling station (other than during current use)? | | √ | | | √ | |
| 2. Manufacturing facility | | √ | | | √ | |
| 3. Vehicle repair facility? | | √ | | | √ | |
| 4. Commercial printing facility? | | √ | | | √ | |
| 5. Dry cleaner? | | √ | | | √ | |
| 6. Photo-processing laboratory? | | √ | | | √ | |
| 7. Junkyard? | | √ | | | √ | |
| 8. Commercial painting facility? | | √ | | | √ | |
| 9. Recycler? | | √ | | | √ | |
| 10. Waste treatment, storage or disposal facility? | | √ | | | √ | |
| 11. Waste transfer station? | | √ | | | √ | |
| 12. Landfill? | | √ | | | √ | |
| 13. Pest control facility? | | √ | | | √ | |
| 14. Asphalt batch plants? | | √ | | | √ | |
| 15. Concrete batch plants? | | √ | | | √ | |
| 16. Gravel pit or other mining operations? | | √ | | | √ | |
| 17. Other industrial facility? | | √ | | | √ | |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| WASTE DISPOSAL | How is waste disposed of and by whom (if applicable)? | Check (✓) if N/A |
|---|---|---|
| 1. Used oil | | √ |
| 2. Oil filters | | √ |
| 3. Wash rack oil/grease | | √ |
| 4. Mud/grit from wash racks | | √ |
| 5. Paint waste | | √ |
| 6. Solvent wash tank waste | | √ |
| 7. Off-spec fuel | | √ |
| 8. Waste antifreeze | | √ |
| 9. Non-hazardous solid waste (dumpsters) | | √ |
| 10. Tires | | √ |
| 11. Batteries | | √ |
| 12. Return concrete or off-spec products | | √ |
| 13. Slimes or fines from wash plant | | √ |
| 14. Other wastes (please specify) | | √ |
| 15. Other wastes (please specify) | | √ |

| UTILITIES | |
|---|---|
| Who provide the following services to the Site? | |
| 1. drinking water | Not applicable |
| 2. gas | Not applicable |
| 3. electricity | Not applicable |
| 4. heating oil, if applicable | Not applicable |
| 5. sanitary sewage disposal | Not applicable |
| 6. garbage disposal | Not applicable |
| 7. industrial wastewater disposal | Not applicable |

# ENVIRONMENTAL SITE ASSESSMENT
# OWNER/OCCUPANT QUESTIONNAIRE

| PERMITS | | | | |
|---|---|---|---|---|
| **To the best of your knowledge,** does the Site have, or has it ever had, any of the following? | **Yes** | **No** | **Don't know** | **Descriptions and/or comments** |
| 1. Storm Water Discharge Permit? Issuing agency and issue date? Fees/taxes paid? Any actions required? When? | √ | | | |
| | SWPPP | | | Permit No. WDID #: 6B15C384488<br>Expiration Date: 06/05/2024 |
| 2. Air quality permit? Issuing agency and issue date? Fees/taxes paid? Any actions required? When? | | √ | | Permit No. Expiration Date: |
| 3. Is the Site registered as a hazardous waste generator? Other registration numbers? Fees/taxes paid? Any actions required? When? | | √ | | RCRA EPA ID No. |
| | | √ | | RCRA State ID No. |
| 4. Wastewater discharge permit? Issuing agency and issue date? Fees/taxes paid? Any actions required? When? | | √ | | Permit No. Expiration Date: |
| 5. Reclamation or mining permit? | | √ | | |
| | | | | Permit No. Expiration Date: |
| | | | | Permit No. Expiration Date: |
| | | | | Permit No. Expiration Date: |
| 6. Special use permit? | √ | | | |
| | Grading Permit | | | Permit No. K2018-06271 Expiration Date: |
| | | | | Permit No. Expiration Date: |
| | | | | Permit No. Expiration Date: |
| 7. Any other types of permits? Please list. | | √ | | |
| | | | | Permit No. Expiration Date: |
| | | | | Permit No. Expiration Date: |
| | | | | Permit No. Expiration Date: |

Please return this questionnaire to:
Angela Brush
abrush@brwncald.com
phone – 619 333 9728

# Appendix K: Vapor Encroachment Screening Report



Privileged and Confidential
Use of contents on this sheet is subject to the limiting conditions specified in Section 1.3 of this document.

**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA 93501

Inquiry Number: 6336067.2s
January 26, 2021

# EDR Vapor Encroachment Screen

## Prepared using EDR's Vapor Encroachment Worksheet

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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| **Secondary Map** | **3** |
| **Map Findings** | **4** |
| **Record Sources and Currency** | **GR-1** |


***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by EDR. The report was designed to assist parties seeking to meet the search requirements of the ASTM Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions (E 2600).

| STANDARD ENVIRONMENTAL RECORDS | Default Area of Concern (Miles)* | property | 1/10 | > 1/10 |
|---|---|---|---|---|
| Federal NPL site list | 2.0 | 0 | 0 | 0 |
| Federal Delisted NPL site list | 2.0 | 0 | 0 | 0 |
| Federal CERCLIS list | 1.5 | 0 | 0 | 0 |
| Federal CERCLIS NFRAP site list | 1.5 | 0 | 0 | 0 |
| Federal RCRA CORRACTS facilities list | 2.0 | 0 | 0 | 0 |
| Federal RCRA non-CORRACTS TSD facilities list | 1.5 | 0 | 0 | 0 |
| Federal RCRA generators list | 1.25 | 0 | 0 | 0 |
| Federal institutional controls / engineering controls registries | 1.5 | 0 | 0 | 0 |
| Federal ERNS list | 1.0 | 0 | 0 | 0 |
| State- and tribal - equivalent NPL | 2.0 | 0 | 0 | 0 |
| State- and tribal - equivalent CERCLIS | 2.0 | 0 | 0 | 0 |
| State and tribal landfill and/or solid waste disposal site lists | 1.5 | 0 | 0 | 0 |
| State and tribal leaking storage tank lists | 1.5 | 0 | 0 | 0 |
| State and tribal registered storage tank lists | 1.25 | 0 | 0 | 0 |
| State and tribal institutional control / engineering control registries | not searched | - | - | - |
| State and tribal voluntary cleanup sites | 1.5 | 0 | 0 | 0 |
| State and tribal Brownfields sites | 1.5 | 0 | 0 | 0 |

| ADDITIONAL ENVIRONMENTAL RECORDS | | | | |
|---|---|---|---|---|
| Local Brownfield lists | 1.5 | 0 | 0 | 0 |
| Local Lists of Landfill / Solid Waste Disposal Sites | 1.5 | 0 | 0 | 0 |
| Local Lists of Hazardous waste / Contaminated Sites | 2.0 | 0 | 0 | 0 |
| Local Lists of Registered Storage Tanks | 1.25 | 0 | 0 | 0 |
| Local Land Records | 1.5 | 0 | 0 | 0 |
| Records of Emergency Release Reports | 1.5 | 0 | 0 | 0 |
| Other Ascertainable Records | 2.0 | 0 | 0 | 0 |

| EDR HIGH RISK HISTORICAL RECORDS | | | | |
|---|---|---|---|---|
| EDR Exclusive Records | 2.0 | 0 | 0 | 0 |
| Exclusive Recovered Govt. Archives | 1.0 | 0 | 0 | 0 |

# EXECUTIVE SUMMARY

**EDR RECOVERED GOVERNMENT ARCHIVES**

| | | | | |
|---|---|---|---|---|
| EDR Exclusive Records | 2.0 | 0 | 0 | 0 |
| Exclusive Recovered Govt. Archives | 1.0 | 0 | 0 | 0 |

*The Default Area of Concern may be adjusted by the environmental professional using experience and professional judgement. Each category may include several databases, and each database may have a different distance. A list of individual databases is provided at the back of this report.

# EXECUTIVE SUMMARY

## TARGET PROPERTY INFORMATION

### ADDRESS

GEM HILL
6459 MOJAVE-TROPICO RD
MOJAVE, CA 93501

### COORDINATES

| | |
|---|---|
| Latitude (North): | 34.92178 - 34° 55′ 18.406677″ |
| Longitude (West): | 118.2269 - 118° 13′ 36.833496″ |
| Elevation: | 2944 ft. above sea level |

# EXECUTIVE SUMMARY

## SEARCH RESULTS

Unmappable (orphan) sites are not considered in the foregoing analysis.

## STANDARD ENVIRONMENTAL RECORDS

| Name | Address | Dist/Dir | Map ID | Page |
|---|---|---|---|---|

Not Reported

## ADDITIONAL ENVIRONMENTAL RECORDS

| Name | Address | Dist/Dir | Map ID | Page |
|---|---|---|---|---|

Not Reported

## EDR HIGH RISK HISTORICAL RECORDS

| Name | Address | Dist/Dir | Map ID | Page |
|---|---|---|---|---|

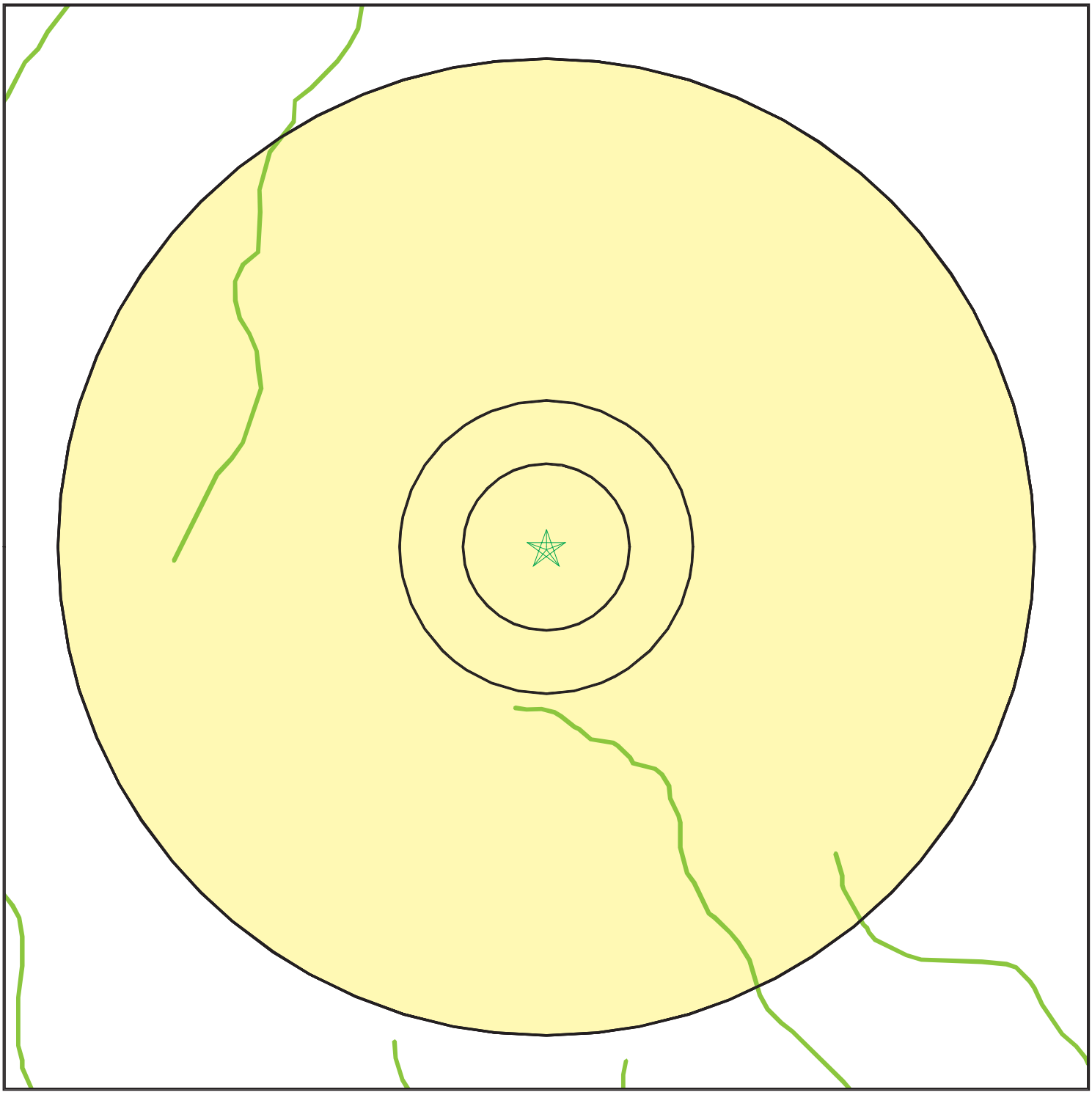
Not Reported

## EDR RECOVERED GOVERNMENT ARCHIVES

| Name | Address | Dist/Dir | Map ID | Page |
|---|---|---|---|---|

Not Reported

# PRIMARY MAP - 6336067.2S



0 300 1/3 Miles

N

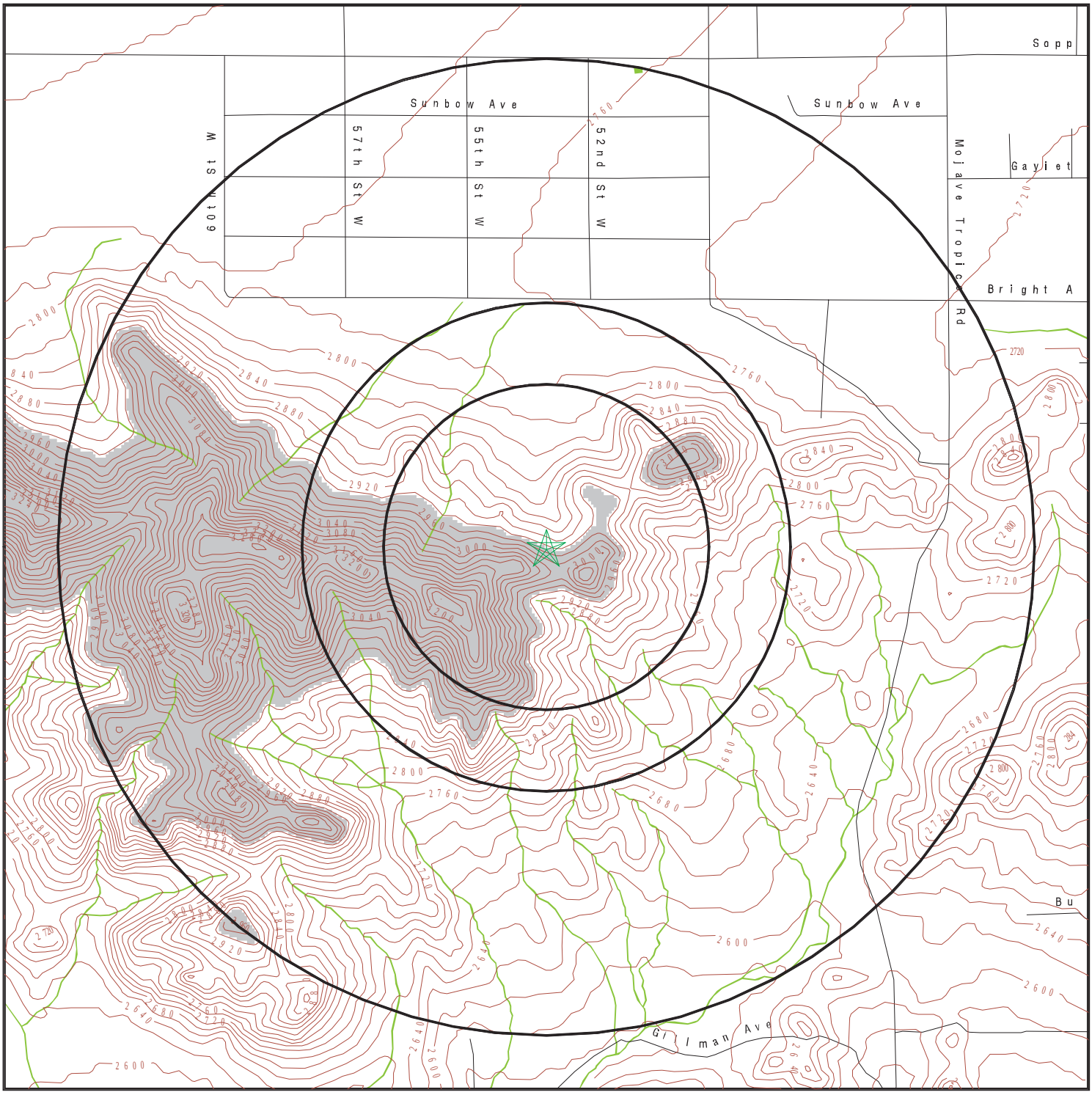
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:08 pm |

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# SECONDARY MAP - 6336067.2S




- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | | | |
|---|---|---|---|
| SITE NAME: | Gem Hill | CLIENT: | Brown & Caldwell Consultants |
| ADDRESS: | 6459 Mojave-Tropico Rd<br>Mojave CA 93501 | CONTACT: | Corey Strauss |
| LAT/LONG: | 34.92178 / 118.2269 | INQUIRY #: | 6336067.2s |
| | | DATE: | January 19, 2021 8:06 pm |

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MAP FINDINGS

**LEGEND**

| | | | |
|---|---|---|---|
| **FACILITY NAME**<br>**FACILITY ADDRESS, CITY, ST, ZIP** | | | EDR SITE ID NUMBER |
| ◆ **MAP ID#** | Direction Distance Range<br>Relative Elevation | (Distance feet / miles)<br>Feet Above Sea Level | ASTM 2600 Record Sources found in this report. Each database searched has been assigned to one or more categories. For detailed information about categorization, see the section of the report Records Searched and Currency. |

**Worksheet:**

**Comments:**

Comments may be added on the online Vapor Encroachment Worksheet.

DATABASE ACRONYM: Applicable categories (A hoverbox with database description).

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| **ENVIRONMENTAL RECORDS** | | | | | | |
| ***Federal NPL site list*** | | | | | | |
| US | NPL | National Priority List | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | Proposed NPL | Proposed National Priority List Sites | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | NPL LIENS | Federal Superfund Liens | EPA | 10/15/1991 | 02/02/1994 | 03/30/1994 |
| ***Federal CERCLIS list*** | | | | | | |
| US | SEMS | Superfund Enterprise Management System | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | |
| US | CORRACTS | Corrective Action Report | EPA | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| ***Federal RCRA TSD facilities list*** | | | | | | |
| US | RCRA-TSDF | RCRA - Treatment, Storage and Disposal | Environmental Protection Agency | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| ***Federal RCRA generators list*** | | | | | | |
| US | RCRA-LQG | RCRA - Large Quantity Generators | Environmental Protection Agency | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| US | RCRA-SQG | RCRA - Small Quantity Generators | Environmental Protection Agency | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| US | RCRA-VSQG | RCRA - Very Small Quantity Generators (Formerly Conditionall | Environmental Protection Agency | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | |
| US | LUCIS | Land Use Control Information System | Department of the Navy | 08/06/2020 | 08/21/2020 | 11/11/2020 |
| US | US ENG CONTROLS | Engineering Controls Sites List | Environmental Protection Agency | 10/28/2020 | 11/05/2020 | 11/18/2020 |
| US | US INST CONTROLS | Institutional Controls Sites List | Environmental Protection Agency | 10/28/2020 | 11/05/2020 | 11/18/2020 |
| ***Federal ERNS list*** | | | | | | |
| US | ERNS | Emergency Response Notification System | National Response Center, United States Coast | 12/14/2020 | 12/15/2020 | 12/22/2020 |
| ***State and tribal - equivalent NPL*** | | | | | | |
| CA | RESPONSE | State Response Sites | Department of Toxic Substances Control | 10/26/2020 | 10/26/2020 | 01/13/2021 |
| ***State and tribal - equivalent CERCLIS*** | | | | | | |
| CA | ENVIROSTOR | EnviroStor Database | Department of Toxic Substances Control | 10/26/2020 | 10/26/2020 | 01/13/2021 |
| ***State and tribal landfill / solid waste disposal*** | | | | | | |
| CA | SWF/LF (SWIS) | Solid Waste Information System | Department of Resources Recycling and Recover | 11/09/2020 | 11/10/2020 | 01/14/2021 |
| ***State and tribal leaking storage tank lists*** | | | | | | |
| CA | LUST REG 9 | Leaking Underground Storage Tank Report | California Regional Water Quality Control Boa | 03/01/2001 | 04/23/2001 | 05/21/2001 |
| CA | LUST REG 7 | Leaking Underground Storage Tank Case Listing | California Regional Water Quality Control Boa | 02/26/2004 | 02/26/2004 | 03/24/2004 |
| CA | LUST REG 4 | Underground Storage Tank Leak List | California Regional Water Quality Control Boa | 09/07/2004 | 09/07/2004 | 10/12/2004 |
| CA | LUST REG 6V | Leaking Underground Storage Tank Case Listing | California Regional Water Quality Control Boa | 06/07/2005 | 06/07/2005 | 06/29/2005 |
| CA | LUST REG 1 | Active Toxic Site Investigation | California Regional Water Quality Control Boa | 02/01/2001 | 02/28/2001 | 03/29/2001 |
| CA | LUST REG 2 | Fuel Leak List | California Regional Water Quality Control Boa | 09/30/2004 | 10/20/2004 | 11/19/2004 |
| CA | LUST REG 8 | Leaking Underground Storage Tanks | California Regional Water Quality Control Boa | 02/14/2005 | 02/15/2005 | 03/28/2005 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| CA | LUST | Leaking Underground Fuel Tank Report (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | LUST REG 5 | Leaking Underground Storage Tank Database | California Regional Water Quality Control Boa | 07/01/2008 | 07/22/2008 | 07/31/2008 |
| CA | LUST REG 3 | Leaking Underground Storage Tank Database | California Regional Water Quality Control Boa | 05/19/2003 | 05/19/2003 | 06/02/2003 |
| CA | LUST REG 6L | Leaking Underground Storage Tank Case Listing | California Regional Water Quality Control Boa | 09/09/2003 | 09/10/2003 | 10/07/2003 |
| US | INDIAN LUST R10 | Leaking Underground Storage Tanks on Indian Land | EPA Region 10 | 04/14/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R1 | Leaking Underground Storage Tanks on Indian Land | EPA Region 1 | 04/29/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R5 | Leaking Underground Storage Tanks on Indian Land | EPA, Region 5 | 04/14/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R4 | Leaking Underground Storage Tanks on Indian Land | EPA Region 4 | 04/14/2020 | 05/26/2020 | 08/12/2020 |
| US | INDIAN LUST R7 | Leaking Underground Storage Tanks on Indian Land | EPA Region 7 | 04/15/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R6 | Leaking Underground Storage Tanks on Indian Land | EPA Region 6 | 04/08/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R8 | Leaking Underground Storage Tanks on Indian Land | EPA Region 8 | 04/14/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN LUST R9 | Leaking Underground Storage Tanks on Indian Land | Environmental Protection Agency | 04/08/2020 | 05/20/2020 | 08/12/2020 |
| CA | CPS-SLIC | Statewide SLIC Cases (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | SLIC REG 1 | Active Toxic Site Investigations | California Regional Water Quality Control Boa | 04/03/2003 | 04/07/2003 | 04/25/2003 |
| CA | SLIC REG 2 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | Regional Water Quality Control Board San Fran | 09/30/2004 | 10/20/2004 | 11/19/2004 |
| CA | SLIC REG 3 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | California Regional Water Quality Control Boa | 05/18/2006 | 05/18/2006 | 06/15/2006 |
| CA | SLIC REG 4 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | Region Water Quality Control Board Los Angele | 11/17/2004 | 11/18/2004 | 01/04/2005 |
| CA | SLIC REG 5 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | Regional Water Quality Control Board Central | 04/01/2005 | 04/05/2005 | 04/21/2005 |
| CA | SLIC REG 6V | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | Regional Water Quality Control Board, Victorv | 05/24/2005 | 05/25/2005 | 06/16/2005 |
| CA | SLIC REG 6L | SLIC Sites | California Regional Water Quality Control Boa | 09/07/2004 | 09/07/2004 | 10/12/2004 |
| CA | SLIC REG 7 | SLIC List | California Regional Quality Control Board, Co | 11/24/2004 | 11/29/2004 | 01/04/2005 |
| CA | SLIC REG 8 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | California Region Water Quality Control Board | 04/03/2008 | 04/03/2008 | 04/14/2008 |
| CA | SLIC REG 9 | Spills, Leaks, Investigation & Cleanup Cost Recovery Listing | California Regional Water Quality Control Boa | 09/10/2007 | 09/11/2007 | 09/28/2007 |
| ***State and tribal registered storage tank lists*** | | | | | | |
| CA | UST | Active UST Facilities | SWRCB | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | MILITARY UST SITES | Military UST Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | UST CLOSURE | Proposed Closure of Underground Storage Tank (UST) Cases | State Water Resources Control Board | 09/03/2020 | 09/08/2020 | 12/03/2020 |
| CA | UST MENDOCINO | Mendocino County UST Database | Department of Public Health | 05/20/2020 | 05/20/2020 | 08/06/2020 |
| CA | AST | Aboveground Petroleum Storage Tank Facilities | California Environmental Protection Agency | 07/06/2016 | 07/12/2016 | 09/19/2016 |
| US | INDIAN UST R9 | Underground Storage Tanks on Indian Land | EPA Region 9 | 04/08/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN UST R6 | Underground Storage Tanks on Indian Land | EPA Region 6 | 04/08/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN UST R7 | Underground Storage Tanks on Indian Land | EPA Region 7 | 04/03/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN UST R1 | Underground Storage Tanks on Indian Land | EPA, Region 1 | 04/29/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN UST R8 | Underground Storage Tanks on Indian Land | EPA Region 8 | 04/14/2020 | 05/20/2020 | 08/13/2020 |
| US | INDIAN UST R4 | Underground Storage Tanks on Indian Land | EPA Region 4 | 04/14/2020 | 05/26/2020 | 08/12/2020 |
| US | INDIAN UST R5 | Underground Storage Tanks on Indian Land | EPA Region 5 | 04/14/2020 | 05/20/2020 | 08/12/2020 |
| US | INDIAN UST R10 | Underground Storage Tanks on Indian Land | EPA Region 10 | 04/14/2020 | 05/20/2020 | 08/12/2020 |
| US | FEMA UST | Underground Storage Tank Listing | FEMA | 07/21/2020 | 09/03/2020 | 11/25/2020 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| ***State and tribal voluntary cleanup sites*** | | | | | | |
| CA | VCP | Voluntary Cleanup Program Properties | Department of Toxic Substances Control | 10/26/2020 | 10/26/2020 | 01/13/2021 |
| US | INDIAN VCP R1 | Voluntary Cleanup Priority Listing | EPA, Region 1 | 07/27/2015 | 09/29/2015 | 02/18/2016 |
| US | INDIAN VCP R7 | Voluntary Cleanup Priority Lisitng | EPA, Region 7 | 03/20/2008 | 04/22/2008 | 05/19/2008 |
| ***State and tribal Brownfields sites*** | | | | | | |
| CA | BROWNFIELDS | Considered Brownfieds Sites Listing | State Water Resources Control Board | 09/21/2020 | 09/22/2020 | 12/11/2020 |
| ***Other Records*** | | | | | | |
| US | CONSENT | Superfund (CERCLA) Consent Decrees | Department of Justice, Consent Decree Library | 09/30/2020 | 10/08/2020 | 01/04/2021 |
| US | ROD | Records Of Decision | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | LIENS 2 | CERCLA Lien Information | Environmental Protection Agency | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| CA | HIST CAL-SITES | Calsites Database | Department of Toxic Substance Control | 08/08/2005 | 08/03/2006 | 08/24/2006 |
| US | DEBRIS REGION 9 | Torres Martinez Reservation Illegal Dump Site Locations | EPA, Region 9 | 01/12/2009 | 05/07/2009 | 09/21/2009 |
| CA | SWRCY | Recycler Database | Department of Conservation | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | CA FID UST | Facility Inventory Database | California Environmental Protection Agency | 10/31/1994 | 09/05/1995 | 09/29/1995 |
| CA | HIST UST | Hazardous Substance Storage Container Database | State Water Resources Control Board | 10/15/1990 | 01/25/1991 | 02/12/1991 |
| CA | SAN FRANCISCO AST | Aboveground Storage Tank Site Listing | San Francisco County Department of Public Hea | 08/03/2020 | 08/05/2020 | 10/22/2020 |
| CA | SWEEPS UST | SWEEPS UST Listing | State Water Resources Control Board | 06/01/1994 | 07/07/2005 | 08/11/2005 |
| US | US AIRS MINOR | Air Facility System Data | EPA | 10/12/2016 | 10/26/2016 | 02/03/2017 |
| US | US AIRS (AFS) | Aerometric Information Retrieval System Facility Subsystem ( | EPA | 10/12/2016 | 10/26/2016 | 02/03/2017 |
| US | SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing | Environmental Protection Agency | 01/01/2017 | 02/03/2017 | 04/07/2017 |
| US | US FIN ASSUR | Financial Assurance Information | Environmental Protection Agency | 09/21/2020 | 09/22/2020 | 12/14/2020 |
| US | COAL ASH EPA | Coal Combustion Residues Surface Impoundments List | Environmental Protection Agency | 01/12/2017 | 03/05/2019 | 11/11/2019 |
| US | PCB TRANSFORMER | PCB Transformer Registration Database | Environmental Protection Agency | 09/13/2019 | 11/06/2019 | 02/10/2020 |
| US | LEAD SMELTER 1 | Lead Smelter Sites | Environmental Protection Agency | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | LEAD SMELTER 2 | Lead Smelter Sites | American Journal of Public Health | 04/05/2001 | 10/27/2010 | 12/02/2010 |
| US | COAL ASH DOE | Steam-Electric Plant Operation Data | Department of Energy | 12/31/2018 | 12/04/2019 | 01/15/2020 |
| US | 2020 COR ACTION | 2020 Corrective Action Program List | Environmental Protection Agency | 09/30/2017 | 05/08/2018 | 07/20/2018 |
| US | US HIST CDL | National Clandestine Laboratory Register | Drug Enforcement Administration | 03/18/2020 | 03/19/2020 | 06/09/2020 |
| US | FUSRAP | Formerly Utilized Sites Remedial Action Program | Department of Energy | 08/08/2017 | 09/11/2018 | 09/14/2018 |
| US | EPA WATCH LIST | EPA WATCH LIST | Environmental Protection Agency | 08/30/2013 | 03/21/2014 | 06/17/2014 |
| US | Delisted NPL | National Priority List Deletions | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | SEMS-ARCHIVE | Superfund Enterprise Management System Archive | EPA | 10/28/2020 | 11/05/2020 | 11/25/2020 |
| US | RCRA NonGen / NLR | RCRA - Non Generators / No Longer Regulated | Environmental Protection Agency | 12/14/2020 | 12/17/2020 | 12/22/2020 |
| US | HMIRS | Hazardous Materials Information Reporting System | U.S. Department of Transportation | 09/20/2020 | 09/22/2020 | 12/14/2020 |
| US | DOT OPS | Incident and Accident Data | Department of Transporation, Office of Pipeli | 01/02/2020 | 01/28/2020 | 04/17/2020 |
| US | US CDL | Clandestine Drug Labs | Drug Enforcement Administration | 03/18/2020 | 03/19/2020 | 06/09/2020 |
| US | US BROWNFIELDS | A Listing of Brownfields Sites | Environmental Protection Agency | 09/14/2020 | 09/15/2020 | 12/10/2020 |
| US | DOD | Department of Defense Sites | USGS | 12/31/2005 | 11/10/2006 | 01/11/2007 |
| US | FEDLAND | Federal and Indian Lands | U.S. Geological Survey | 04/02/2018 | 04/11/2018 | 11/06/2019 |
| US | FUDS | Formerly Used Defense Sites | U.S. Army Corps of Engineers | 08/05/2020 | 08/13/2020 | 10/21/2020 |
| US | UMTRA | Uranium Mill Tailings Sites | Department of Energy | 08/30/2019 | 11/15/2019 | 01/28/2020 |
| US | ODI | Open Dump Inventory | Environmental Protection Agency | 06/30/1985 | 08/09/2004 | 09/17/2004 |
| US | MINES VIOLATIONS | MSHA Violation Assessment Data | DOL, Mine Safety & Health Admi | 09/10/2020 | 09/15/2020 | 11/20/2020 |
| US | US MINES | Mines Master Index File | Department of Labor, Mine Safety and Health A | 08/04/2020 | 08/25/2020 | 11/18/2020 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| US | US MINES 2 | Ferrous and Nonferrous Metal Mines Database Listing | USGS | 05/06/2020 | 05/27/2020 | 08/13/2020 |
| US | US MINES 3 | Active Mines & Mineral Plants Database Listing | USGS | 04/14/2011 | 06/08/2011 | 09/13/2011 |
| US | PRP | Potentially Responsible Parties | EPA | 04/27/2020 | 05/06/2020 | 06/09/2020 |
| US | TRIS | Toxic Chemical Release Inventory System | EPA | 12/31/2018 | 08/14/2020 | 11/04/2020 |
| US | TSCA | Toxic Substances Control Act | EPA | 12/31/2016 | 06/17/2020 | 09/10/2020 |
| US | FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu | EPA/Office of Prevention, Pesticides and Toxi | 04/09/2009 | 04/16/2009 | 05/11/2009 |
| US | FTTS INSP | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fu | EPA | 04/09/2009 | 04/16/2009 | 05/11/2009 |
| US | HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing | Environmental Protection Agency | 10/19/2006 | 03/01/2007 | 04/10/2007 |
| US | HIST FTTS INSP | FIFRA/TSCA Tracking System Inspection & Enforcement Case Lis | Environmental Protection Agency | 10/19/2006 | 03/01/2007 | 04/10/2007 |
| US | SSTS | Section 7 Tracking Systems | EPA | 10/19/2020 | 10/19/2020 | 01/04/2021 |
| US | ICIS | Integrated Compliance Information System | Environmental Protection Agency | 11/18/2016 | 11/23/2016 | 02/10/2017 |
| US | PADS | PCB Activity Database System | EPA | 10/09/2019 | 10/11/2019 | 12/20/2019 |
| US | MLTS | Material Licensing Tracking System | Nuclear Regulatory Commission | 08/05/2020 | 08/10/2020 | 10/08/2020 |
| US | RADINFO | Radiation Information Database | Environmental Protection Agency | 07/01/2019 | 07/01/2019 | 09/23/2019 |
| US | FINDS | Facility Index System/Facility Registry System | EPA | 09/04/2020 | 09/15/2020 | 11/20/2020 |
| US | RAATS | RCRA Administrative Action Tracking System | EPA | 04/17/1995 | 07/03/1995 | 08/07/1995 |
| US | RMP | Risk Management Plans | Environmental Protection Agency | 07/24/2020 | 08/03/2020 | 10/21/2020 |
| US | BRS | Biennial Reporting System | EPA/NTIS | 12/31/2017 | 06/22/2020 | 11/20/2020 |
| US | PWS | Public Water System Data | EPA | 12/17/2013 | 01/09/2014 | 10/15/2014 |
| US | INDIAN RESERV | Indian Reservations | USGS | 12/31/2014 | 07/14/2015 | 01/10/2017 |
| US | INDIAN ODI | Report on the Status of Open Dumps on Indian Lands | Environmental Protection Agency | 12/31/1998 | 12/03/2007 | 01/24/2008 |
| US | IHS OPEN DUMPS | Open Dumps on Indian Land | Department of Health & Human Serivces, Indian | 04/01/2014 | 08/06/2014 | 01/29/2015 |
| US | ABANDONED MINES | Abandoned Mines | Department of Interior | 09/16/2020 | 09/17/2020 | 12/10/2020 |
| CA | CA BOND EXP. PLAN | Bond Expenditure Plan | Department of Health Services | 01/01/1989 | 07/27/1994 | 08/02/1994 |
| CA | CDL | Clandestine Drug Labs | Department of Toxic Substances Control | 06/30/2019 | 05/28/2020 | 08/12/2020 |
| CA | CHMIRS | California Hazardous Material Incident Report System | Office of Emergency Services | 09/30/2020 | 10/19/2020 | 01/07/2021 |
| CA | CORTESE | "Cortese" Hazardous Waste & Substances Sites List | CAL EPA/Office of Emergency Information | 06/22/2020 | 06/22/2020 | 09/04/2020 |
| CA | CUPA LIVERMORE-PLEASANTON | CUPA Facility Listing | Livermore-Pleasanton Fire Department | 05/01/2019 | 05/14/2019 | 07/17/2019 |
| CA | DEED | Deed Restriction Listing | DTSC and SWRCB | 08/31/2020 | 08/31/2020 | 11/20/2020 |
| CA | DRYCLEANERS | Cleaner Facilities | Department of Toxic Substance Control | 08/06/2020 | 08/28/2020 | 11/17/2020 |
| CA | DRYCLEAN SOUTH COAST | South Coast Air Quality Management District Drycleaner Listi | South Coast Air Quality Management District | 08/19/2020 | 08/21/2020 | 09/04/2020 |
| CA | DRYCLEAN AVAQMD | Antelope Valley Air Quality Management District Drycleaner L | Antelope Valley Air Quality Management Distri | 08/25/2020 | 08/26/2020 | 11/13/2020 |
| CA | EMI | Emissions Inventory Data | California Air Resources Board | 12/31/2018 | 06/16/2020 | 08/28/2020 |
| CA | ENF | Enforcement Action Listing | State Water Resoruces Control Board | 10/16/2020 | 10/19/2020 | 01/07/2021 |
| CA | Financial Assurance 1 | Financial Assurance Information Listing | Department of Toxic Substances Control | 10/13/2020 | 10/14/2020 | 01/04/2021 |
| CA | Financial Assurance 2 | Financial Assurance Information Listing | California Integrated Waste Management Board | 08/05/2020 | 08/05/2020 | 10/23/2020 |
| CA | HAULERS | Registered Waste Tire Haulers Listing | Integrated Waste Management Board | 05/28/2020 | 05/29/2020 | 08/12/2020 |
| CA | HAZNET | Facility and Manifest Data | California Environmental Protection Agency | 12/31/2019 | 04/15/2020 | 07/02/2020 |
| CA | HIST CORTESE | Hazardous Waste & Substance Site List | Department of Toxic Substances Control | 04/01/2001 | 01/22/2009 | 04/08/2009 |
| CA | HWP | EnviroStor Permitted Facilities Listing | Department of Toxic Substances Control | 08/17/2020 | 08/17/2020 | 11/05/2020 |
| CA | HWT | Registered Hazardous Waste Transporter Database | Department of Toxic Substances Control | 10/05/2020 | 10/06/2020 | 12/23/2020 |
| CA | ICE | ICE | Department of Toxic Subsances Control | 08/17/2020 | 08/17/2020 | 11/05/2020 |
| CA | LDS | Land Disposal Sites Listing (GEOTRACKER) | State Water Qualilty Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | LIENS | Environmental Liens Listing | Department of Toxic Substances Control | 08/26/2020 | 08/28/2020 | 11/17/2020 |
| CA | MCS | Military Cleanup Sites Listing (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | MINES | Mines Site Location Listing | Department of Conservation | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | MWMP | Medical Waste Management Program Listing | Department of Public Health | 08/31/2020 | 08/31/2020 | 11/20/2020 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| CA | NPDES | NPDES Permits Listing | State Water Resources Control Board | 08/10/2020 | 08/10/2020 | 10/29/2020 |
| CA | PEST LIC | Pesticide Regulation Licenses Listing | Department of Pesticide Regulation | 08/31/2020 | 08/31/2020 | 11/20/2020 |
| CA | PROC | Certified Processors Database | Department of Conservation | 09/08/2020 | 09/08/2020 | 12/01/2020 |
| CA | NOTIFY 65 | Proposition 65 Records | State Water Resources Control Board | 12/07/2020 | 12/09/2020 | 12/10/2020 |
| CA | SCH | School Property Evaluation Program | Department of Toxic Substances Control | 10/26/2020 | 10/26/2020 | 01/13/2021 |
| CA | SPILLS 90 | SPILLS90 data from FirstSearch | FirstSearch | 06/06/2012 | 01/03/2013 | 02/22/2013 |
| CA | TOXIC PITS | Toxic Pits Cleanup Act Sites | State Water Resources Control Board | 07/01/1995 | 08/30/1995 | 09/26/1995 |
| CA | UIC | UIC Listing | Deaprtment of Conservation | 09/08/2020 | 09/08/2020 | 12/01/2020 |
| CA | WASTEWATER PITS | Oil Wastewater Pits Listing | RWQCB, Central Valley Region | 11/19/2019 | 01/07/2020 | 03/09/2020 |
| CA | WDS | Waste Discharge System | State Water Resources Control Board | 06/19/2007 | 06/20/2007 | 06/29/2007 |
| CA | WIP | Well Investigation Program Case List | Los Angeles Water Quality Control Board | 07/03/2009 | 07/21/2009 | 08/03/2009 |
| CA | WMUDS/SWAT | Waste Management Unit Database | State Water Resources Control Board | 04/01/2000 | 04/10/2000 | 05/10/2000 |
| CA | PFAS | PFAS Contamination Site Location Listing | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 12/01/2020 |
| US | FUELS PROGRAM | EPA Fuels Program Registered Listing | EPA | 08/17/2020 | 08/17/2020 | 10/21/2020 |
| CA | CIWQS | California Integrated Water Quality System | State Water Resources Control Board | 08/31/2020 | 08/31/2020 | 11/20/2020 |
| CA | CERS HAZ WASTE | CERS HAZ WASTE | CalEPA | 10/19/2020 | 10/19/2020 | 01/07/2021 |
| US | ECHO | Enforcement & Compliance History Information | Environmental Protection Agency | 10/03/2020 | 10/06/2020 | 01/04/2021 |
| CA | WELL STIM PROJ | Well Stimulation Project (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | UIC GEO | Underground Injection Control Sites (GEOTRACKER) | State Water Resource Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | PROD WATER PONDS | Produced Water Ponds Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | OTHER OIL GAS | Other Oil & Gas Projects Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | NON-CASE INFO | Non-Case Information Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | MILITARY PRIV SITES | Military Privatized Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | SAMPLING POINT | Sampling Point ? Public Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | PROJECT | Project Sites (GEOTRACKER) | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 11/30/2020 |
| CA | CERS | CalEPA Regulated Site Portal Data | California Environmental Protection Agency | 10/19/2020 | 10/19/2020 | 01/07/2021 |
| CA | HWTS | Hazardous Waste Tracking System | Department of Toxic Substances Control | 10/13/2020 | 10/14/2020 | 11/03/2020 |
| US | DOCKET HWC | Hazardous Waste Compliance Docket Listing | Environmental Protection Agency | 05/31/2018 | 07/26/2018 | 10/05/2018 |
| CA | WDR | Waste Discharge Requirements Listing | State Water Resources Control Board | 09/08/2020 | 09/08/2020 | 12/01/2020 |
| US | MINES MRDS | Mineral Resources Data System | USGS | 04/06/2018 | 10/21/2019 | 10/24/2019 |
| US | UXO | Unexploded Ordnance Sites | Department of Defense | 12/31/2018 | 07/02/2020 | 09/17/2020 |
| CA | CERS TANKS | California Environmental Reporting System (CERS) Tanks | California Environmental Protection Agency | 10/19/2020 | 10/19/2020 | 01/07/2021 |
| **HISTORICAL USE RECORDS** | | | | | | |
| US | EDR MGP | EDR Proprietary Manufactured Gas Plants | EDR, Inc. | | | |
| US | EDR Hist Auto | EDR Exclusive Historical Auto Stations | EDR, Inc. | | | |
| US | EDR Hist Cleaner | EDR Exclusive Historical Cleaners | EDR, Inc. | | | |
| CA | RGA LF | Recovered Government Archive Solid Waste Facilities List | Department of Resources Recycling and Recover | | 07/01/2013 | 01/13/2014 |
| CA | RGA LUST | Recovered Government Archive Leaking Underground Storage Tan | State Water Resources Control Board | | 07/01/2013 | 12/30/2013 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| **COUNTY RECORDS** | | | | | | |
| CA | CS ALAMEDA | Contaminated Sites | Alameda County Environmental Health Services | 01/09/2019 | 01/11/2019 | 03/05/2019 |
| CA | UST ALAMEDA | Underground Tanks | Alameda County Environmental Health Services | 10/01/2020 | 10/06/2020 | 12/23/2020 |
| CA | CUPA AMADOR | CUPA Facility List | Amador County Environmental Health | 10/19/2020 | 10/22/2020 | 01/12/2021 |
| CA | CUPA BUTTE | CUPA Facility Listing | Public Health Department | 04/21/2017 | 04/25/2017 | 08/09/2017 |
| CA | CUPA CALVERAS | CUPA Facility Listing | Calveras County Environmental Health | 12/15/2020 | 12/16/2020 | 12/24/2020 |
| CA | CUPA COLUSA | CUPA Facility List | Health & Human Services | 04/06/2020 | 04/23/2020 | 07/10/2020 |
| CA | SL CONTRA COSTA | Site List | Contra Costa Health Services Department | 10/19/2020 | 10/22/2020 | 01/13/2021 |
| CA | CUPA DEL NORTE | CUPA Facility List | Del Norte County Environmental Health Divisio | 06/08/2020 | 08/13/2020 | 10/22/2020 |
| CA | CUPA EL DORADO | CUPA Facility List | El Dorado County Environmental Management Dep | 08/13/2020 | 08/13/2020 | 10/22/2020 |
| CA | CUPA FRESNO | CUPA Resources List | Dept. of Community Health | 10/02/2020 | 10/06/2020 | 12/22/2020 |
| CA | CUPA GLENN | CUPA Facility List | Glenn County Air Pollution Control District | 01/22/2018 | 01/24/2018 | 03/14/2018 |
| CA | CUPA HUMBOLDT | CUPA Facility List | Humboldt County Environmental Health | 08/13/2020 | 08/17/2020 | 11/05/2020 |
| CA | CUPA IMPERIAL | CUPA Facility List | San Diego Border Field Office | 10/14/2020 | 10/15/2020 | 01/05/2021 |
| CA | CUPA INYO | CUPA Facility List | Inyo County Environmental Health Services | 04/02/2018 | 04/03/2018 | 06/14/2018 |
| CA | CUPA KERN | CUPA Facility List | Kern County Public Health | 10/29/2020 | 10/30/2020 | 01/15/2021 |
| CA | UST KERN | Underground Storage Tank Sites & Tank Listing | Kern County Environment Health Services Depar | 07/28/2020 | 07/30/2020 | 10/14/2020 |
| CA | CUPA KINGS | CUPA Facility List | Kings County Department of Public Health | 05/11/2020 | 05/12/2020 | 07/27/2020 |
| CA | CUPA LAKE | CUPA Facility List | Lake County Environmental Health | 08/13/2020 | 08/13/2020 | 10/23/2020 |
| CA | CUPA LASSEN | CUPA Facility List | Lassen County Environmental Health | 07/31/2020 | 08/21/2020 | 11/09/2020 |
| CA | AOCONCERN | Key Areas of Concerns in Los Angeles County | | 03/30/2009 | 03/31/2009 | 10/23/2009 |
| CA | HMS LOS ANGELES | HMS: Street Number List | Department of Public Works | 10/19/2020 | 10/20/2020 | 01/12/2021 |
| CA | LF LOS ANGELES | List of Solid Waste Facilities | La County Department of Public Works | 10/09/2020 | 10/09/2020 | 12/29/2020 |
| CA | LF LOS ANGELES CITY | City of Los Angeles Landfills | Engineering & Construction Division | 12/31/2019 | 08/17/2020 | 11/05/2020 |
| CA | LOS ANGELES AST | Active & Inactive AST Inventory | Los Angeles Fire Department | 06/01/2019 | 06/25/2019 | 08/22/2019 |
| CA | LOS ANGELES CO LF METHANE | Methane Producing Landfills | Los Angeles County Department of Public Works | 04/30/2012 | 04/17/2019 | 05/29/2019 |
| CA | LOS ANGELES HM | Active & Inactive Hazardous Materials Inventory | Los Angeles Fire Department | 06/01/2019 | 06/25/2019 | 08/22/2019 |
| CA | LOS ANGELES UST | Active & Inactive UST Inventory | Los Angeles Fire Department | 06/01/2019 | 06/25/2019 | 08/22/2019 |
| CA | SITE MIT LOS ANGELES | Site Mitigation List | Community Health Services | 07/20/2020 | 10/09/2020 | 12/29/2020 |
| CA | UST EL SEGUNDO | City of El Segundo Underground Storage Tank | City of El Segundo Fire Department | 01/21/2017 | 04/19/2017 | 05/10/2017 |
| CA | UST LONG BEACH | City of Long Beach Underground Storage Tank | City of Long Beach Fire Department | 04/22/2019 | 04/23/2019 | 06/27/2019 |
| CA | UST TORRANCE | City of Torrance Underground Storage Tank | City of Torrance Fire Department | 09/11/2020 | 10/07/2020 | 12/23/2020 |
| CA | CUPA MADERA | CUPA Facility List | Madera County Environmental Health | 08/10/2020 | 08/12/2020 | 10/23/2020 |
| CA | UST MARIN | Underground Storage Tank Sites | Public Works Department Waste Management | 09/26/2018 | 10/04/2018 | 11/02/2018 |
| CA | CUPA MERCED | CUPA Facility List | Merced County Environmental Health | 07/28/2020 | 07/30/2020 | 07/31/2020 |
| CA | CUPA MONO | CUPA Facility List | Mono County Health Department | 08/20/2020 | 08/24/2020 | 11/09/2020 |
| CA | CUPA MONTEREY | CUPA Facility Listing | Monterey County Health Department | 07/13/2020 | 07/15/2020 | 07/31/2020 |
| CA | LUST NAPA | Sites With Reported Contamination | Napa County Department of Environmental Manag | 01/09/2017 | 01/11/2017 | 03/02/2017 |
| CA | UST NAPA | Closed and Operating Underground Storage Tank Sites | Napa County Department of Environmental Manag | 09/05/2019 | 09/09/2019 | 10/31/2019 |
| CA | CUPA NEVADA | CUPA Facility List | Community Development Agency | 10/26/2020 | 10/28/2020 | 01/15/2021 |
| CA | IND_SITE ORANGE | List of Industrial Site Cleanups | Health Care Agency | 06/10/2020 | 08/03/2020 | 10/19/2020 |
| CA | LUST ORANGE | List of Underground Storage Tank Cleanups | Health Care Agency | 07/02/2020 | 08/05/2020 | 10/23/2020 |
| CA | UST ORANGE | List of Underground Storage Tank Facilities | Health Care Agency | 07/01/2020 | 08/03/2020 | 10/19/2020 |
| CA | MS PLACER | Master List of Facilities | Placer County Health and Human Services | 11/24/2020 | 11/24/2020 | 11/25/2020 |
| CA | CUPA PLUMAS | CUPA Facility List | Plumas County Environmental Health | 03/31/2019 | 04/23/2019 | 06/26/2019 |
| CA | LUST RIVERSIDE | Listing of Underground Tank Cleanup Sites | Department of Environmental Health | 10/06/2020 | 10/07/2020 | 11/03/2020 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|
| CA | UST RIVERSIDE | Underground Storage Tank Tank List | Department of Environmental Health | 10/06/2020 | 10/07/2020 | 11/03/2020 |
| CA | CS SACRAMENTO | Toxic Site Clean-Up List | Sacramento County Environmental Management | 02/18/2020 | 03/31/2020 | 06/15/2020 |
| CA | ML SACRAMENTO | Master Hazardous Materials Facility List | Sacramento County Environmental Management | 02/24/2020 | 03/31/2020 | 06/17/2020 |
| CA | CUPA SAN BENITO | CUPA Facility List | San Benito County Environmental Health | 10/28/2020 | 10/30/2020 | 01/15/2021 |
| CA | PERMITS SAN BERNARDINO | Hazardous Material Permits | San Bernardino County Fire Department Hazardo | 08/04/2020 | 08/05/2020 | 10/26/2020 |
| CA | HMMD SAN DIEGO | Hazardous Materials Management Division Database | Hazardous Materials Management Division | 08/31/2020 | 08/31/2020 | 11/23/2020 |
| CA | LF SAN DIEGO | Solid Waste Facilities | Department of Health Services | 04/18/2018 | 04/24/2018 | 06/19/2018 |
| CA | SAN DIEGO CO LOP | Local Oversight Program Listing | Department of Environmental Health | 07/14/2020 | 07/16/2020 | 09/29/2020 |
| CA | SAN DIEGO CO SAM | Environmental Case Listing | San Diego County Department of Environmental | 03/23/2010 | 06/15/2010 | 07/09/2010 |
| CA | CUPA SAN FRANCISCO CO | CUPA Facility Listing | San Francisco County Department of Environmen | 08/03/2020 | 08/05/2020 | 10/22/2020 |
| CA | LUST SAN FRANCISCO | Local Oversite Facilities | Department Of Public Health San Francisco Cou | 09/19/2008 | 09/19/2008 | 09/29/2008 |
| CA | UST SAN FRANCISCO | Underground Storage Tank Information | Department of Public Health | 08/03/2020 | 08/05/2020 | 10/26/2020 |
| CA | UST SAN JOAQUIN | San Joaquin Co. UST | Environmental Health Department | 06/22/2018 | 06/26/2018 | 07/11/2018 |
| CA | CUPA SAN LUIS OBISPO | CUPA Facility List | San Luis Obispo County Public Health Departme | 07/27/2020 | 08/12/2020 | 10/26/2020 |
| CA | BI SAN MATEO | Business Inventory | San Mateo County Environmental Health Service | 02/20/2020 | 02/20/2020 | 04/24/2020 |
| CA | LUST SAN MATEO | Fuel Leak List | San Mateo County Environmental Health Service | 03/29/2019 | 03/29/2019 | 05/29/2019 |
| CA | CUPA SANTA BARBARA | CUPA Facility Listing | Santa Barbara County Public Health Department | 09/08/2011 | 09/09/2011 | 10/07/2011 |
| CA | CUPA SANTA CLARA | Cupa Facility List | Department of Environmental Health | 08/20/2020 | 08/20/2020 | 11/09/2020 |
| CA | HIST LUST SANTA CLARA | HIST LUST - Fuel Leak Site Activity Report | Santa Clara Valley Water District | 03/29/2005 | 03/30/2005 | 04/21/2005 |
| CA | LUST SANTA CLARA | LOP Listing | Department of Environmental Health | 03/03/2014 | 03/05/2014 | 03/18/2014 |
| CA | SAN JOSE HAZMAT | Hazardous Material Facilities | City of San Jose Fire Department | 07/30/2020 | 07/31/2020 | 10/16/2020 |
| CA | CUPA SANTA CRUZ | CUPA Facility List | Santa Cruz County Environmental Health | 01/21/2017 | 02/22/2017 | 05/23/2017 |
| CA | CUPA SHASTA | CUPA Facility List | Shasta County Department of Resource Manageme | 06/15/2017 | 06/19/2017 | 08/09/2017 |
| CA | LUST SOLANO | Leaking Underground Storage Tanks | Solano County Department of Environmental Man | 06/04/2019 | 06/06/2019 | 08/13/2019 |
| CA | UST SOLANO | Underground Storage Tanks | Solano County Department of Environmental Man | 08/25/2020 | 08/26/2020 | 09/16/2020 |
| CA | CUPA SONOMA | Cupa Facility List | County of Sonoma Fire & Emergency Services De | 12/15/2020 | 12/16/2020 | 12/23/2020 |
| CA | LUST SONOMA | Leaking Underground Storage Tank Sites | Department of Health Services | 09/18/2020 | 09/22/2020 | 12/14/2020 |
| CA | CUPA STANISLAUS | CUPA Facility List | Stanislaus County Department of Ennvironmenta | 10/01/2020 | 10/06/2020 | 12/22/2020 |
| CA | UST SUTTER | Underground Storage Tanks | Sutter County Environmental Health Services | 08/25/2020 | 08/26/2020 | 11/17/2020 |
| CA | CUPA TEHAMA | CUPA Facility List | Tehama County Department of Environmental Hea | 08/11/2020 | 08/12/2020 | 10/26/2020 |
| CA | CUPA TRINITY | CUPA Facility List | Department of Toxic Substances Control | 10/14/2020 | 10/15/2020 | 01/05/2021 |
| CA | CUPA TULARE | CUPA Facility List | Tulare County Environmental Health Services D | 08/06/2020 | 08/06/2020 | 10/26/2020 |
| CA | CUPA TUOLUMNE | CUPA Facility List | Divison of Environmental Health | 04/23/2018 | 04/25/2018 | 06/25/2018 |
| CA | BWT VENTURA | Business Plan, Hazardous Waste Producers, and Operating Unde | Ventura County Environmental Health Division | 09/28/2020 | 10/22/2020 | 01/12/2021 |
| CA | LF VENTURA | Inventory of Illegal Abandoned and Inactive Sites | Environmental Health Division | 12/01/2011 | 12/01/2011 | 01/19/2012 |
| CA | LUST VENTURA | Listing of Underground Tank Cleanup Sites | Environmental Health Division | 05/29/2008 | 06/24/2008 | 07/31/2008 |
| CA | MED WASTE VENTURA | Medical Waste Program List | Ventura County Resource Management Agency | 09/28/2020 | 10/22/2020 | 01/12/2021 |
| CA | UST VENTURA | Underground Tank Closed Sites List | Environmental Health Division | 08/26/2020 | 09/08/2020 | 12/01/2020 |
| CA | UST YOLO | Underground Storage Tank Comprehensive Facility Report | Yolo County Department of Health | 12/21/2020 | 12/23/2020 | 01/04/2021 |
| CA | CUPA YUBA | CUPA Facility List | Yuba County Environmental Health Department | 08/06/2020 | 08/07/2020 | 10/26/2020 |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

| St | Acronym | Full Name | Government Agency | Gov Date | Arvl. Date | Active Date |
|---|---|---|---|---|---|---|

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# Appendix L: Building Permit Report



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SC07360_Gem Hill Phase I ESA_Rev1.docx

**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA 93501

Inquiry Number: 6336067.8
January 19, 2021

# EDR Building Permit Report

## Target Property and Adjoining Properties

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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## SECTION

**About This Report**

**Executive Summary**

**Findings**

**Glossary**

***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EDR BUILDING PERMIT REPORT

## About This Report

The EDR Building Permit Report provides a practical and efficient method to search building department records for indications of environmental conditions. Generated via a search of municipal building permit records gathered from more than 1,600 cities nationwide, this report will assist you in meeting the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

Building permit data can be used to identify current and/or former operations and structures/features of environmental concern. The data can provide information on a target property and adjoining properties such as the presence of underground storage tanks, pump islands, sumps, drywells, etc., as well as information regarding water, sewer, natural gas, electrical connection dates, and current/former septic tanks.

## ASTM and EPA Requirements

ASTM E 1527-13 lists building department records as a "standard historical source," as detailed in § 8.3.4.7: "Building Department Records - The term building department records means those records of the local government in which the property is located indicating permission of the local government to construct, alter, or demolish improvements on the property." ASTM also states that "Uses in the area surrounding the property shall be identified in the report, but this task is required only to the extent that this information is revealed in the course of researching the property itself."

EPA's Standards and Practices for All Appropriate Inquires (AAI) states: "§312.24: Reviews of historical sources of information. (a) Historical documents and records must be reviewed for the purposes of achieving the objectives and performance factors of §312.20(e) and (f). Historical documents and records may include, but are not limited to, aerial photographs, fire insurance maps, building department records, chain of title documents, and land use records."

## Methodology

EDR has developed the EDR Building Permit Report through our partnership with BuildFax, the nation's largest repository of building department records. BuildFax collects, updates, and manages building department records from local municipal governments. The database now includes 30 million permits, on more than 10 million properties across 1,600 cities in the United States.

The EDR Building Permit Report comprises local municipal building permit records, gathered directly from local jurisdictions, including both target property and adjoining properties. Years of coverage vary by municipality. Data reported includes (where available): date of permit, permit type, permit number, status, valuation, contractor company, contractor name, and description.

Incoming permit data is checked at seven stages in a regimented quality control process, from initial data source interview, to data preparation, through final auditing. To ensure the building department is accurate, each of the seven quality control stages contains, on average, 15 additional quality checks, resulting in a process of approximately 105 quality control "touch points."

For more information about the EDR Building Permit Report, please contact your EDR Account Executive at (800) 352-0050.

EDR® Environmental Data Resources Inc

BUILDFAX® PROPERTY HISTORY

# EXECUTIVE SUMMARY: SEARCH DOCUMENTATION

A search of building department records was conducted by Environmental Data Resources, Inc (EDR) on behalf of Brown & Caldwell Consultants on Jan 19, 2021.

**TARGET PROPERTY**

6459 Mojave-Tropico Rd
Mojave, CA 93501

**SEARCH METHODS**

EDR searches available lists for both the Target Property and Surrounding Properties.

**RESEARCH SUMMARY**

Building permits identified: **YES**

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

**Kern County**

| *Year* | *Source* | *TP* | *Adjoining* |
|---|---|---|---|
| 2021 | County of Kern, Building Inspection Division | | |
| 2020 | County of Kern, Building Inspection Division | | |
| 2019 | County of Kern, Building Inspection Division | | |
| 2018 | County of Kern, Building Inspection Division | | |
| 2017 | County of Kern, Building Inspection Division | | |
| 2016 | County of Kern, Building Inspection Division | | |
| 2015 | County of Kern, Building Inspection Division | | |
| 2014 | County of Kern, Building Inspection Division | | |
| 2013 | County of Kern, Building Inspection Division | | |
| 2012 | County of Kern, Building Inspection Division | | |
| 2011 | County of Kern, Building Inspection Division | | |
| 2010 | County of Kern, Building Inspection Division | | |
| 2009 | County of Kern, Building Inspection Division | | |
| 2008 | County of Kern, Building Inspection Division | | |
| 2007 | County of Kern, Building Inspection Division | | |
| 2006 | County of Kern, Building Inspection Division | | |
| 2005 | County of Kern, Building Inspection Division | | |
| 2004 | County of Kern, Building Inspection Division | | X |
| 2003 | County of Kern, Building Inspection Division | | |
| 2002 | County of Kern, Building Inspection Division | | |
| 2001 | County of Kern, Building Inspection Division | | |
| 2000 | County of Kern, Building Inspection Division | | |
| 1999 | County of Kern, Building Inspection Division | | |
| 1998 | County of Kern, Building Inspection Division | | |
| 1997 | County of Kern, Building Inspection Division | | |
| 1996 | County of Kern, Building Inspection Division | | |
| 1995 | County of Kern, Building Inspection Division | | |
| 1994 | County of Kern, Building Inspection Division | | |

# EXECUTIVE SUMMARY: SEARCH DOCUMENTATION

| Year | Source | TP | Adjoining |
|---|---|---|---|
| 1993 | County of Kern, Building Inspection Division | | |
| 1992 | County of Kern, Building Inspection Division | | |
| 1991 | County of Kern, Building Inspection Division | | |
| 1990 | County of Kern, Building Inspection Division | | |
| 1989 | County of Kern, Building Inspection Division | | |
| 1988 | County of Kern, Building Inspection Division | | |
| 1987 | County of Kern, Building Inspection Division | | |

Name: JurisdictionName
Years: Years
Source: Source
Phone: Phone

**BUILDING DEPARTMENT RECORDS SEARCHED**

Name: Kern County
Years: 1987-2021
Source: County of Kern, Building Inspection Division, MOJAVE, CA
Phone: (661) 862-8650

# TARGET PROPERTY FINDINGS

## TARGET PROPERTY DETAIL

**6459 Mojave-Tropico Rd**
**Mojave, CA 93501**

No Permits Found

# ADJOINING PROPERTY FINDINGS

## ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

### CRESCENT AVE

#### 3480 CRESCENT AVE

| | |
|---|---|
| Date: | **11/23/2004** |
| Permit Type: | **BUILDING** |
| Description: | **INSTALL MH ON PERM FNDN** |
| Permit Description: | |
| Work Class: | MOBILH |
| Proposed Use: | |
| Permit Number: | K200409862 |
| Status: | FINALED |
| Valuation: | $0.00 |
| Contractor Company: | |
| Contractor Name: | AMERISTAR CONSTRUCTION |

# GLOSSARY

**General Building Department concepts**

- **ICC:** The International Code Council. The governing body for the building/development codes used by all jurisdictions who've adopted the ICC guidelines. MOST of the US has done this. Canada, Mexico, and other countries use ICC codes books and guides as well. There are a few states who have added guidelines to the ICC codes to better fit their needs. For example, California has added seismic retrofit requirements for most commercial structures.
- **Building Department (Permitting Authority, Building Codes, Inspections Department, Building and Inspections):** This is the department in a jurisdiction where an owner or contractor goes to obtain permits and inspections for building, tearing down, remodeling, adding to, re-roofing, moving or otherwise making changes to any structure, Residential or Commercial.
- **Jurisdiction:** This is the geographic area representing the properties over which a Permitting Authority has responsibility.
- **GC:** General Contractor. Usually the primary contractor hired for any Residential or Commercial construction work.
- **Sub:** Subordinate contracting companies or subcontractors. Usually a "trades" contractor working for the GC. These contractors generally have an area of expertise in which they are licensed like Plumbing, Electrical, Heating and Air systems, Gas Systems, Pools etc. (called "trades").
- **Journeymen:** Sub contractors who have their own personal licenses in one or more trades and work for different contracting companies, wherever they are needed or there is work.
- **HVAC (Mechanical, Heating & Air companies):** HVAC = Heating, Ventilation, and Air Conditioning.
- **ELEC (Electrical, TempPole, TPole, TPower, Temporary Power, Panel, AMP Change, Power Release):** Electrical permits can be pulled for many reasons. The most common reason is to increase the AMPs of power in an electrical power panel. This requires a permit in almost every jurisdiction. Other commons reason for Electrical permits is to insert a temporary power pole at a new construction site. Construction requires electricity, and in a new development, power has yet to be run to the lot. The temporary power pole is usually the very first permit pulled for new development. The power is released to the home owner when construction is complete and this sometimes takes the form of a Power Release permit or inspection.
- **"Pull" a permit:** To obtain and pay for a building permit.
- **CBO:** Chief Building Official
- **Planning Department:** The department in the development process where the building /structural plans are reviewed for their completeness and compliance with building codes
- **Zoning Department:** The department in the development process where the site plans are reviewed for their compliance with the regulations associated with the zoning district in which they are situated.
- **Zoning District:** A pre-determined geographic boundary within a jurisdiction where certain types of structures are permitted / prohibited. Examples are Residential structure, Commercial/Retail structures, Industrial/Manufacturing structures etc. Each zoning district has regulations associated with it like the sizes of the lots, the density of the structures on the lots, the number of parking spaces required for certain types of structures on the lots etc.
- **PIN (TMS, GIS ID, Parcel#):** Property Identification Number and Tax Map System number.
- **State Card (Business license):** A license card issued to a contractor to conduct business.
- **Building Inspector (Inspector):** The inspector is a building department employee that inspects building construction for compliance to codes.
- **C.O.:** Certificate of Occupancy. This is the end of the construction process and designates that the owners now have permission to occupy a structure after its building is complete. Sometimes also referred to as a Certificate of Compliance.

# GLOSSARY

**Permit Content Definitions**

- Permit Number: The alphanumerical designation assigned to a permit for tracking within the building department system. Sometimes the permit number gives clues to its role, e.g. a "PL" prefix may designate a plumbing permit.
- Description: A field on the permit form that allows the building department to give a brief description of the work being done. More often than not, this is the most important field for EP's to find clues to the prior use(s) of the property.
- Permit Type: Generally a brief designation of the type of job being done. For example BLDG-RES, BLDG-COM, ELEC, MECH etc.

**Sample Building Permit Data**

Date: Nov 09, 2000
Permit Type: Bldg -
New Permit Number: 101000000405
Status: Valuation: $1,000,000.00
Contractor Company: OWNER-BUILDER
Contractor Name:

Description: New one store retail (SAV-ON) with drive-thru pharmacy. Certificate of Occupancy.

# Appendix M: Property Tax Report



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**Gem Hill**
6459 Mojave-Tropico Rd
Mojave, CA 93501

Inquiry Number: 6336067.6
January 19, 2021

# The EDR Property Tax Map Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

# EDR Property Tax Map Report

Environmental Data Resources, Inc.'s EDR Property Tax Map Report is designed to assist environmental professionals in evaluating potential environmental conditions on a target property by understanding property boundaries and other characteristics. The report includes a search of available property tax maps, which include information on boundaries for the target property and neighboring properties, addresses, parcel identification numbers, as well as other data typically used in property location and identification.

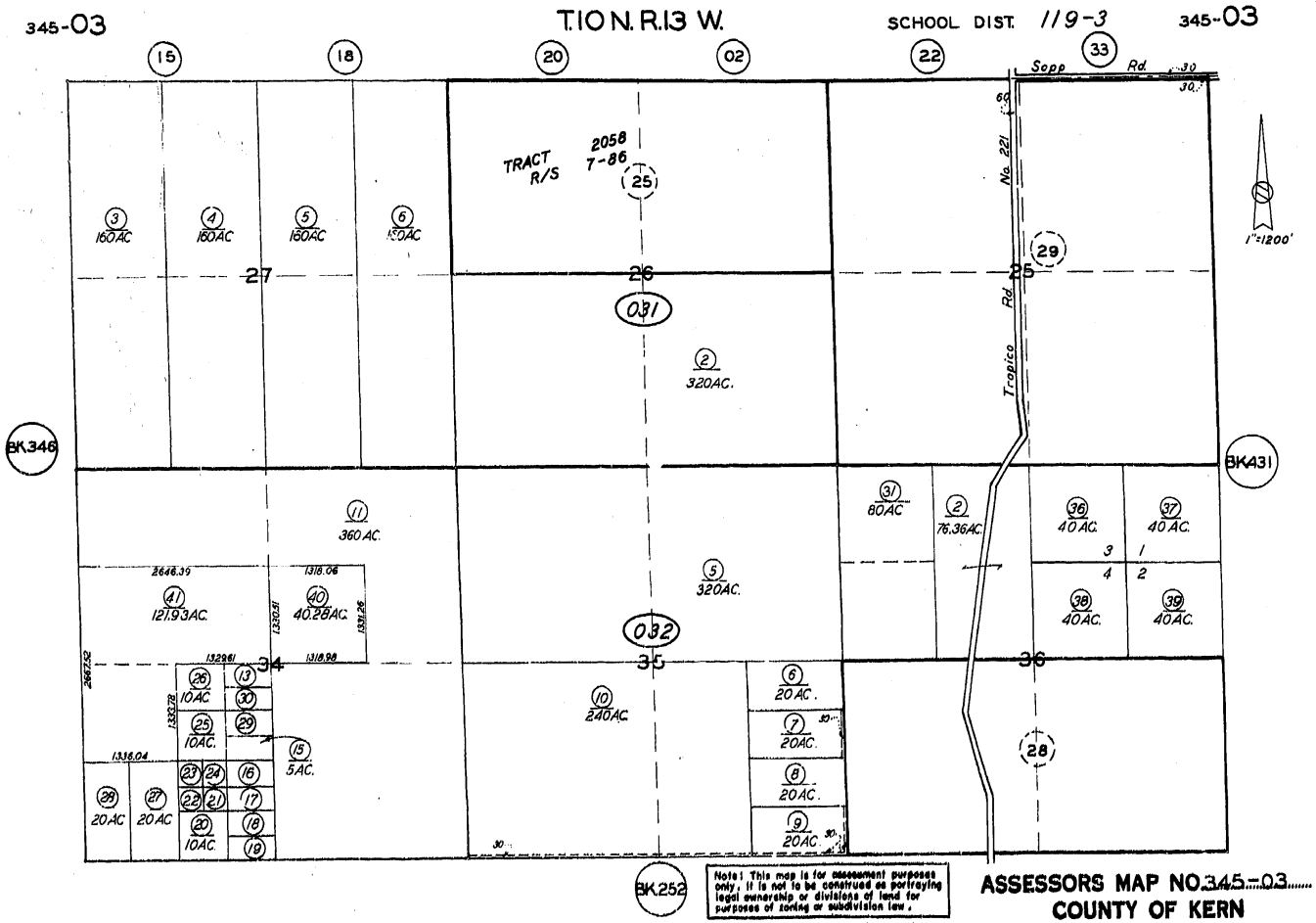
***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

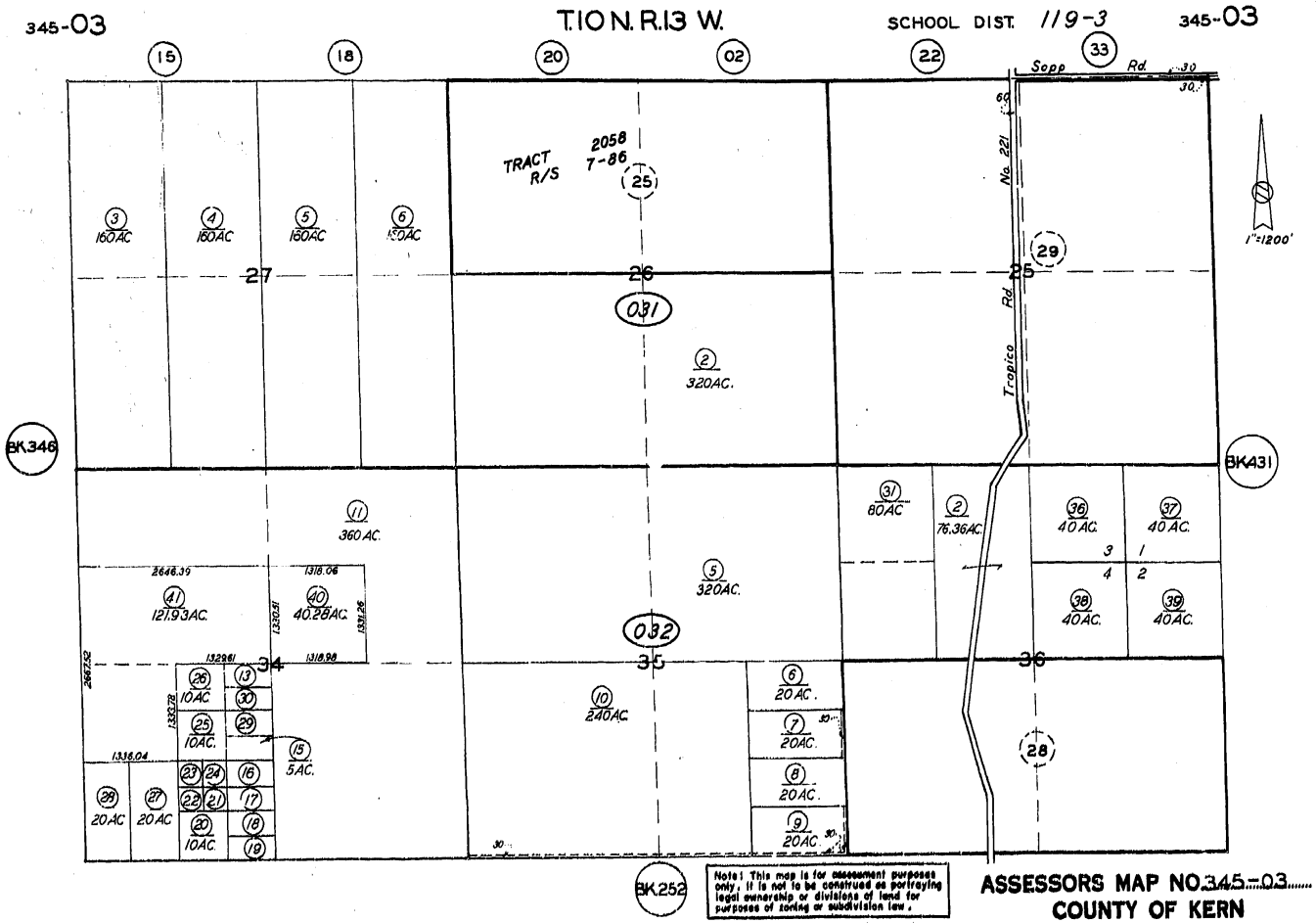
**Disclaimer - Copyright and Trademark Notice**

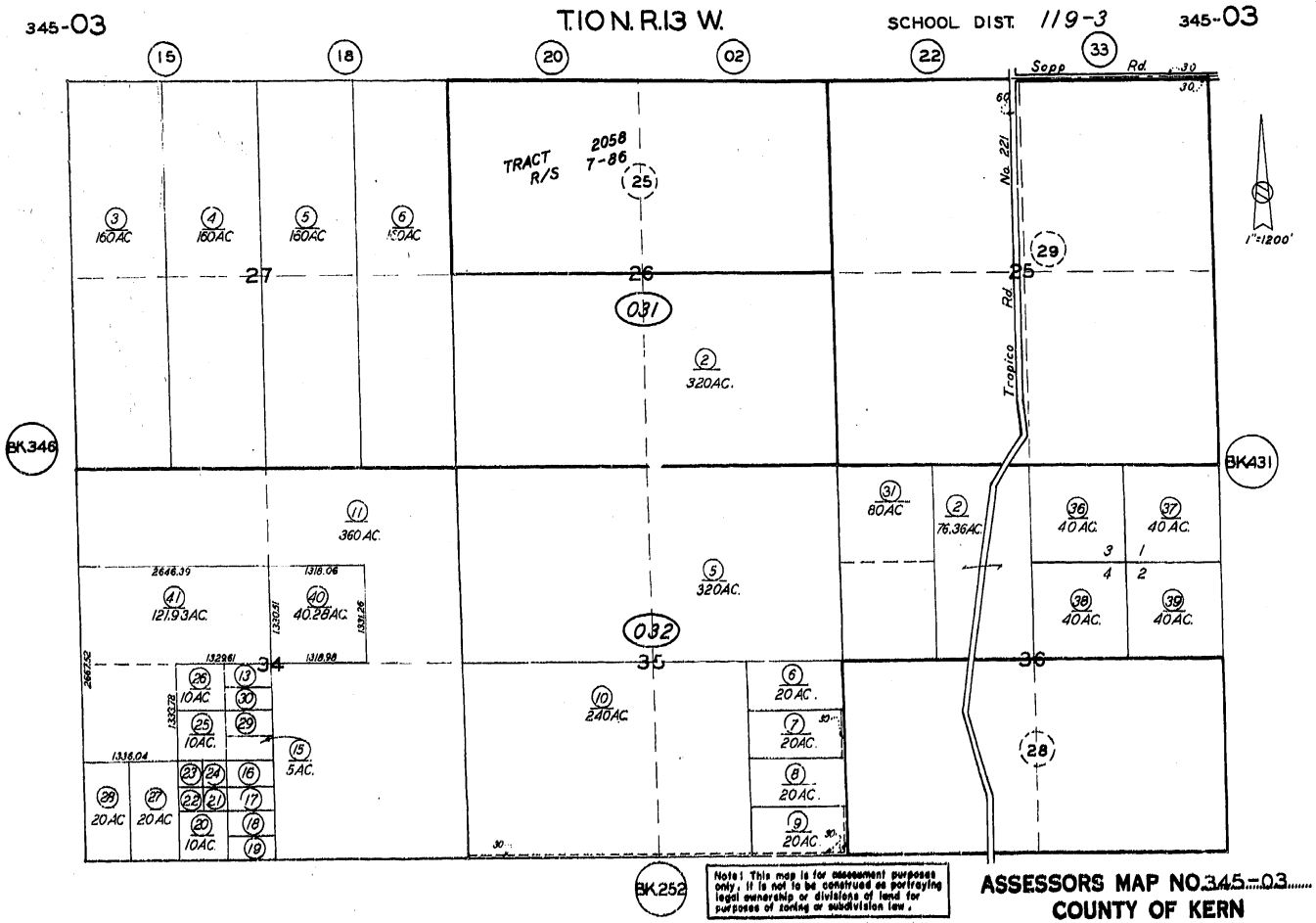
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345-03
T.10 N. R.13 W.
SCHOOL DIST. 119-3
345-03
Sopp Rd.
TRACT 2058 7-86 R/S
No. 221
Tropico Rd.
1"=1200'
BK346
BK431
BK252
031
032
160 AC.
320 AC.
360 AC.
80 AC.
76.36 AC.
40 AC.
121.93 AC.
40.28 AC.
10 AC.
5 AC.
20 AC.
240 AC.
Note: This map is for assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.
ASSESSORS MAP NO. 345-03
COUNTY OF KERN

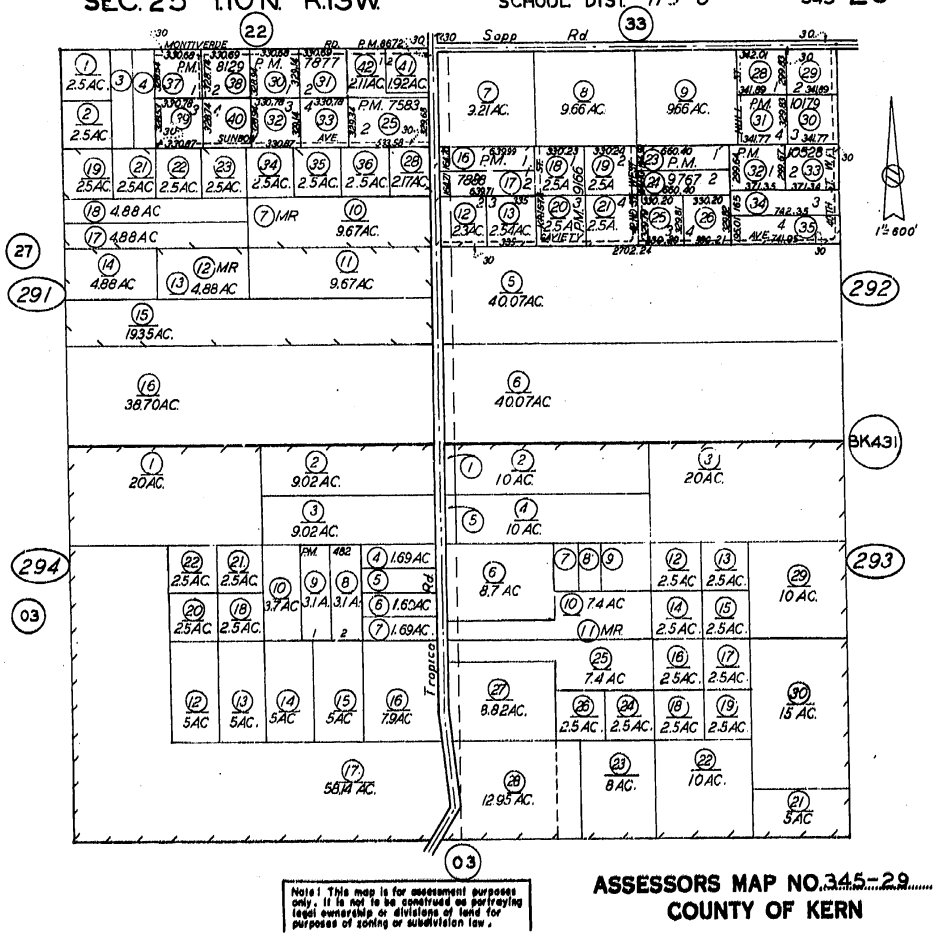

345-03
T.10 N. R.13 W.
SCHOOL DIST. 119-3
345-03
Sopp Rd.
TRACT 2058 7-86 R/S
No. 221
Tropico Rd.
1"=1200'
BK346
BK431
BK252
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032
160 AC.
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ASSESSORS MAP NO. 345-03
COUNTY OF KERN


345-03
T.10 N. R.13 W.
SCHOOL DIST. 119-3
345-03
Sopp Rd.
TRACT 2058 7-86 R/S
No. 221
Tropico Rd.
1"=1200'
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10 AC.
5 AC.
20 AC.
240 AC.
Note: This map is for assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.
ASSESSORS MAP NO. 345-03
COUNTY OF KERN

345-29

SEC. 25 T.10 N. R.13 W. SCHOOL DIST. 119-3

345-29



# Appendix N: Site and Surrounding Property Photographs



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SC07360_Gem Hill Phase I ESA_Rev1.docx



Access road onto the Site from Mojave-Tropico Road up to the graded pads



Small graded pad



Large graded pad



Boulders surrounding the large pad



Typical groundcover across the Site



Adjacent property to southeast, previously excavated area



Dark patch is concentrated area of maroon lava rocks, can be seen on aerial photographs



Dirt road bordering the northern side of the site, no street name



Greenhouse north of the site



Adjacent property to the North



Adjacent property to the East



Adjacent property to the South



Adjacent property to the West

# Appendix O: Resumes



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## Experience Summary

Corey Strauss has 15 years of professional experience as a project geologist conducting various site investigations which includes multiple techniques of contaminated site characterization and assessment groundwater sampling in a variety of media including unconsolidated alluvial and fluvial sediments, glacial deposits, as well as hard and soft rock. He is very experienced managing large drilling investigation programs and routine groundwater monitoring events. He has concurrently managed up to nine drill rigs and two well development rigs and associated crews and geologists from various offices around the country and ensured all data quality objectives were met as well as making health and safety a top priority on all field projects.

**Assignment**

*Project Geologist*

**Education**

*B.S., Geology, Iowa State University, 2006*

**Experience**

*15 years*

**Joined Firm**

*2006*

**Registration**

*Professional Geologist Utah, 9404662-2250*

**Special Skills and Certifications**

*OSHA/HAZWOPER Certified*

*OSHA Site Supervisor*

*MSHA Certified*

*First Aid/CPR*

**Relevant Expertise**

- *Soil, groundwater, and soil vapor sampling techniques*
- *Calibration and operation of YSI water quality probes and various turbidity meters,*
- *USCS Soil classification*
- *Proficient with Surfer® and gINT®*
- *Hydrogeologic characteristic analyses including slug testing and pump testing*
- *Borehole logging techniques using temperature, fluid conductivity, caliper, natural gamma, video logging and spinner/flow meter logging*
- *Fixed and mobile lab work including sample preparation, analysis, and comprehension using standard EPA methods; including: spectrophotometers, colorimetric testing, and titration*
- *Various drilling methods including roto-sonic, air-rotary, casing hammer, mud rotary, rock coring, hollow-stem auger, and GeoProbe®/Hydropunch® in various geologic media.*

## Environmental

### Former Anaconda Copper Mine Site, Atlantic Richfield Company, Yerington, Nevada

**Lead Geologist.** Provided oversight for the drilling, soil logging and classification, and depth-specific water sampling on four, ten-month long field investigation programs. Each borehole was lithologically logged to characterize the hydrogeologic conditions throughout the site and to determine optimal intervals where a bladder pump, outfitted with an inflatable packer, was lowered into a temporary monitoring well to collect a water sample. Conducted field laboratory analyses with test kits to provide in the field results to supplement laboratory analyses. Supervised well development and hydraulic testing and installed dedicated groundwater sampling pumps. In total, approximately 300 permanent PVC monitor wells have been installed for subsequent quarterly groundwater sampling. At the conclusion of each drilling program, compiled all data into a summary report that included potentiometric and chemical distribution maps, hydrographs, and lithologic and geochemical cross-sections.

### Former Anaconda Copper Mine Site, Atlantic Richfield Company, Yerington, Nevada

**Field Manager/Field Staff.** Managed and participated in groundwater domestic well sampling activities for quarterly monitoring events. While managing, coordinated activities with 3-7 person sampling teams ensuring all quality control/quality assurance samples were collected and all activities followed standard operating procedures outlined in the Quality Assurance Project Plan (QAPP). As a part of the sampling team, collected water samples and water quality parameter measurements.

### Former Anaconda Copper Mine Site, Atlantic Richfield Company, Yerington, Nevada

**Lead Geologist.** Conducted a soil and shallow groundwater investigation using GeoProbe® technology to collect electroconductivity logs to determine potential areas to install temporary wells to collect groundwater samples. Managed two rigs that collected approximately 230 samples to assist in groundwater characterization efforts.

### Former Anaconda Copper Mine Site, Atlantic Richfield Company, Yerington, Nevada

**Lead Geologist.** Conducted a shallow groundwater investigation using in and around the historic Evaporation Ponds. Supervised the installation and subsequent abandonment of temporary monitor wells and collected soil samples for geotechnical testing. Supervised the installation of porous cup

lysimeters and soil moisture sensors and data loggers for vadose zone characterization activities. (2015-2016)

### Former Anaconda Copper Mine Site, Atlantic Richfield Company, Yerington, Nevada

**Lead Geologist.** Supervised two additional geologists and participated in the collection of hydrologic tracers from monitor wells and surface water locations to assist in characterizing groundwater migrating through and around a mine site. Tracer parameters included tritium/helium, chlorofluorocarbons, sulfur hexafluoride, uranium, sulfate and nitrogen isotopes, and stable isotopes in water.

### Site Investigation, Confidential Client, Half Moon Bay, California

**Field Geologist.** Provided field support for routine groundwater and surface water sampling activities as well as assisted with streamflow measurements/calculations.

### Lanes Creek Mine Point-of-Compliance Well Installations, Nu-West Industries, Inc., DBA Agrium Conda Phosphate Mine, Caribou County, Idaho

**Field Geologist.** Provided oversight of monitor well installation using air rotary drilling methods at an active phosphate mine site. Logged drill cuttings, evaluated groundwater producing zones, and provided direction on well construction and development.

### Site Investigation, Sacramento Municipal Utilities District (SMUD), Sacramento, California

**Field Geologist.** Provided oversight of installation and development of two monitor wells. Oversaw the abandonment of a large diameter production well via blasting and grouting. Collected soil samples from excavated test pits.

### Site Investigation, Confidential Client, Cheshire, Connecticut

**Field Geologist.** At a hydrocarbon impacted site, staffed a hollow stem auger rig drilling through overburden sediments for the collection of soil samples and the installation of monitor wells. Once bedrock was encountered, a core rig was utilized to drill into bedrock to find potential flow pathways leading away from the site. Twelve monitor wells were installed in overburden deposits and seven in bedrock. During a second phase of drilling a mud rotary rig was used drill and set seven additional wells, two in overburden and five in bedrock.

### Tank Hill Facility, Montana State Superfund Site, Cut Bank, Montana

**Field Scientist.** Conducted and supervised an ongoing quarterly water sampling program with associated reporting. Oversaw drilling, monitoring well installation, aquifer testing, and impact assessment. Conducted investigations to determine origin and fate/transport mechanisms for petroleum-impacted groundwater. Lithological characterization of bedrock including logging of core drilling and air-rotary drilling. Conducted well abandonment of historic monitor wells. Conducted non-aqueous phase liquid (NAPL) removal using vacuum-enhanced skimming extraction technology, absorbent socks, and a belt skimmer system. Site impacts included multiple bedrock aquifers, multiple NAPL groundwater plumes, impacted surface soils, bedrock seeps of NAPL and dissolved hydrocarbons, impacted surface water, and vapors in homes and businesses.

### Phase I & II ESA, Galt Acquisitions, Value Place Hotel, Missoula, Montana

**Field Scientist.** Performed a Phase I and II ESA for three acres of previously-developed land that had once been the Missoula County Department of Transportation Shop. The background search revealed a number of leaking underground storage tanks (USTs) on the property. The surrounding properties were developed as mixed industrial, residential, and commercial property. Performed a site reconnaissance, interviewed on-site personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations. Phase II activities included drilling through glacial till deposits to collect soil and water samples.

### Phase I ESA, Columbus Airport Expansion, Beartooth Resource Conservation and Development, Columbus, Montana

**Field Scientist.** Performed a Phase I ESA of approximately 10 acres of land previously used as a Class III Landfill which also contained wetland areas. The surrounding properties were developed as mixed industrial, chromium processing plant, and undeveloped property. Performed a site reconnaissance, interviewed on-site

personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations. Based on the report's findings, the airport decided not to expand their operations.

### Phase I ESA, Key Energy, Casper, Wyoming

**Field Scientist.** Performed a Phase I ESA for approximately two acres of undeveloped land. The surrounding properties were developed as mixed industrial, residential, and undeveloped property. Performed a site reconnaissance, conducted a naturally-occurring radioactive materials (NORM) survey, interviewed on-site personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations.

### Phase I ESA, McDonald's, Laurel, Montana

**Field Scientist**. Performed a Phase I ESA for approximately 1.5 acres of undeveloped land. The surrounding properties were developed as mixed industrial, commercial, and undeveloped property. Performed a site reconnaissance, interviewed on-site personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations. Based on the report's findings, the client purchased the property.

### Phase I ESA, Advanced Care Hospital, Billings, Montana

**Field Scientist**. Performed a Phase I ESA approximately three acres of undeveloped land. The surrounding properties were developed as mixed industrial, commercial, and undeveloped property. Performed a site reconnaissance, interviewed on-site personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations. Based on the report's findings, the client purchased and built as planned on the property.

### Phase I ESA, BJ Services Co., Dickinson, North Dakota

**Field Scientist**. Performed a Phase I Environmental Site Assessment (ESA) for approximately three acres of undeveloped land. The surrounding properties were developed as mixed industrial, commercial, and undeveloped property. Performed a site reconnaissance, interviewed on-site personnel, photographed and documented findings, and prepared a Phase I ESA Report with conclusions and recommendations.

## Experience Summary

Kristene has 18 years of experience in geology and hydrogeology in the environmental and groundwater industry. Kristene has managed environmental remediation projects of varying size and complexity. She has also managed portfolios, including a high volume of environmental cases for high profile clients. Kristene has provided project management and technical expertise on groundwater investigations, remedial actions, groundwater studies, and risk analyses. Her work has included various projects throughout California, with extensive experience in the Central Valley and the San Francisco Bay Area. She is experienced in remedial investigation for sites with varying contaminants, as well as project oversight and regulatory negotiations. She has also been involved with mine cleanup and hazardous waste management sites. Kristene has overseen a division of an environmental company where she was previously employed. Since joining BC in 2016, Kristene has taken on the project management role for a key client, Sacramento Municipal Utility District (SMUD) and is responsible for the oversight and management of a $2M contract. The primary activities for this client involve primarily providing environmental services for three sites in Sacramento that include remediation pilot testing, design, and implementation for a chlorinated solvent plume, and closure assistance and hazard mitigation at two waste disposal sites.

**Assignment**

*Managing Hydrogeologist*

**Education**

*B.S., Earth Science/Geology, University of California, San Diego, 1999*

**Registration**

*Certified Hydrogeologist, California No. 969, (2009)*

*Professional Geologist, California No. 8583, (2008)*

**Training**

*Occupational Safety and Health Administration (OSHA) 40-Hour Hazardous Waste Operations Certification*

*American Red Cross First Aid, Cardiopulmonary Resuscitation (CPR) and Automated External Defibrillator (AED) Certification*

**Experience**

*19 years*

**Joined Firm**

*2016*

**Relevant Expertise**

- *Hydrogeology*
- *Groundwater monitoring*
- *Aquifer testing*
- *Groundwater remediation*
- *Regulatory negotiation*
- *Hazardous waste management*

## Environmental Services/Remediation

### UC Davis Bodega Marine Laboratory, Bodega Bay, California

**Technical Lead.** Negotiated with the regulatory agency, developed a strategy to progress the project toward closure, and oversaw the execution of the field work. Reviewed the completion report and ensured the project was completed per UC Davis' preferred schedule.

### UC Davis Center for Aquatic Biology and Aquaculture (CABA) Putah Creek Facility, Davis, California

**Project Manager.** Evaluated the potential for groundwater degradation from CABA, Putah Creek Facility current effluent discharge. The primary constituent of interest is chloroform from the university's historic landfill. The study included an evaluation of the existing groundwater plume and background groundwater quality near the effluent ponds, and calculations for infiltration from CABA's discharges. BC also evaluated groundwater flow directions and gradients, analyzed chloroform concentrations trends, and the overall plume distribution. Kristene oversaw the project execution and the on time, on budget delivery of the tech memo to support the UC Davis new Report of Waste Discharge (ROWD).

### Site Remediation, Confidential Client, California

**Project Manager.** This client is investigating the source of chlorinated volatile organize compounds (VOCs) at a site formerly used as an industrial laundry and an adjacent carton manufacturing facility. Work included VOC source investigation and exposure pathway/risk evaluation. Kristene served as project manager and Professional Geologist/Hydrogeologist of Record. Since joining BC, Kristene has overseen a soil vapor extraction pilot test, groundwater amendment pilot test, site investigation, and reporting activities. She provides the client with support for potential community outreach support and public hazard mitigation. She has also been successful in providing regulatory negotiation services for this site.

### Groundwater Evaluation, Folsom Corporation Yard, City of Folsom, California

**Hydrogeologist.** BC provides technical services to the City of Folsom for a former landfill facility. Groundwater monitoring, sampling, and evaluation has

been performed since 1996. The landfill was clean-closed in 2008 and groundwater monitoring has continued since that time. Kristene recently provided technical assistance as the lead hydrogeologist in re-evaluating the well network due to potential data quality issues in the historical well network. She was responsible for evaluating the historical groundwater data, designing the new network, and aiding the project manager with negotiation with the Regional Water Quality Control Board for approval of this new well network. The new well network was put in place in 2017 with the hopes of expedited Site closure based on the new data.

### Groundwater Monitoring Plan, Confidential Client, California

**Project Manager.** BC is helping this client fulfill the provision of a Waste Discharge Requirements (WDR) permit issued by the San Francisco Bay Regional Water Quality Control Board. Kristene served as project manager and Professional Geologist/Hydrogeologist of Record to develop a groundwater monitoring plan and re-engineer the site's wastewater treatment system to meet nitrate limits.

### Remedial Investigation, Feasibility Study, and Remedial Design, Mission Linen Supply, Visalia, California

**Project Manager.** Mission Linen Supply needed to investigate and clean up a chlorinated solvent groundwater plume. The property was a current industrial laundry facility. Historical activities at the site had included dry cleaning operations in the 1970s and 1980s. At that time, tetrachloroethylene (PCE) was heavily used in the dry cleaning industry. PCE in the subsurface had been identified due to an area-wide subsurface investigation performed by the California Department of Toxic Substances Control (DTSC) where elevated PCE concentrations were detected in soil vapor adjacent to the site. The DTSC directed the operator of the laundry and the owner of the Site, Mission Linen Supply, to perform a remedial investigation. Kristene was responsible for the overall site strategy including the scope and magnitude of the investigation, which included groundwater, soil vapor, membrane interface probe (MIP), and indoor air investigation. Kristene oversaw and directed the field effort, and was responsible for technical analysis and report preparation. Two phases of both on and offsite investigation were necessary to identify the source and extent of the solvent impacts to the subsurface. It was determined that the release occurred due to historic waste discharge to the sanitary sewer, which was in poor condition and allowed infiltration of contaminated waste water into the subsurface adjacent to the site.

Kristene prepared a feasibility study and determined that enhanced in-situ bioremediation (EISB) would be the remedial strategy for the site. She was responsible for all aspects of the remedial design and implementation, as well as responsible for cost proposals, budget tracking, and scoping for this project.

*[Performed while at The Source Group, Inc. in 2009]*

### Remediation Investigation and Implementation, Confidential Client, San Leandro, California

**Project Geologist.** Kristene provided technical assistance for the former Kaiser Aerotech Facility in San Leandro, California. Contaminants at the site included PCE, trichloroethylene (TCE), and cis-1,2 dichloroethylene (cis-1,2-DCE). Characterization activities performed by Kristene included designing plans for plume vertical and lateral plume delineation and to aid in remedial design. Kristene prepared a draft and final Remedial Action Plan (RAP) based on site data and previous pilot testing, prepared a Remedial Design and Implementation Plan (RDIP), and carried out remedial activities. The selected remedy was enhanced in-situ bioremediation (EISB) using sodium lactate as a substrate. The remedial effort was carried out in four phases over several years. Kristene additionally performed remedial progress sampling and analysis to determine the success of the EISB. Kristene served as a field team leader and provided overall project support for all aspects of the project.

*[Performed while at The Source Group, Inc. in 2010]*

### Remedial Investigation, Remedial Activities, and Site Closure, SF Rents, Inc., Dublin, California

**Project Manager.** Kristene managed an investigation/cleanup of a hydrocarbon release located at a former furniture shop where various chemical releases had occurred in an onsite sump. Investigation activities included well installation, soil borings, aquifer testing, and data analysis. Kristene also performed risk assessment for vapor intrusion to indoor air. Remediation activities included excavation of approximately 100 tons of impacted soil and EISB. After completion of remedial activities and post-remediation monitoring, Kristene successfully negotiated closure for the site with unrestricted use as a commercial facility.

*[Performed while at The Source Group, Inc. in 2010]*

### Groundwater Investigation and Compliance, Fuel Terminal, Sunoco Oil, Inc., Richmond, California

**Project Manager.** Kristene managed all environmental site activities at a former Sunoco bulk oil distribution terminal in Richmond, California. These activities included monitoring and management of free product consisting of heavy oil. Management included the design and installation of an interceptor trench that bordered the site and directed oil and water within the trench to an onsite oil/water separator. Kristene was responsible for overseeing compliance groundwater monitoring, as well as project scoping, budget management, and project tracking.

*[Performed while at The Source Group, Inc. in 2010]*

### Investigation and Remediation of Pesticides Impacted Site, Occidental Petroleum, Stockton, California

**Project Hydrogeologist.** Kristene provided technical support and project management for a former pesticide manufacturing plant site in Stockton, California. Remedial activities at the site included phytoremediation consisting of a grove of eucalyptus trees, and EISB. Activities performed by Kristene included planning, implementation, and data analysis of a constant rate pump test and using the data to make modifications to the existing phytoremediation design, and plan for the planned EISB. Kristene also directed field efforts, authored several technical documents including complex site remediation progress reports and remedial design and implementation plans.

*[Performed while at The Source Group, Inc. in 2011]*

### Former Mine Waste and Hydrogeologic Investigation, Sunoco, Inc., Clayton, California

**Project Hydrogeologist.** Kristene provided technical support for the characterization of waste and impacts at the former Mt. Diablo Mercury Mine in Clayton, California. Project activities included sampling of springs, surface water, and mine waste characterization. Additionally, Kristene oversaw the drilling and completion of two monitoring wells completed in two different levels of the mine workings. The purpose of these wells was to determine any potential connection in groundwater from the upper to the lower former mine working. Groundwater levels were continuously monitored in these wells and Kristene was responsible for analysis and reporting of this data. Kristene co-authored the report summarizing these activities.

*[Performed while at The Source Group, Inc. in 2011]*

### Environmental Program Management, Atlantic Richfield Company (ARCO/BP), Northern California

**Program Manager and Supervising Geologist/Hydrogeologist.** Kristene served as the program manager for her previous company's largest client, a major oil company. Kristene was responsible for senior oversight and scoping for a total of approximately 50 environmental remediation cases at retail service stations in Northern California. Kristene was responsible for overall budget planning and tracking, senior review of all environmental documents, oversight and ensuring compliance of the client's rigorous health and safety program, and staff mentoring. Additionally, Kristene was the lead regulatory negotiator for these cases. During her tenure as program manager, she achieved case closure at over half of the environmental cases.

*[Performed while at Broadbent, Associates, Inc. in 2012 through 2016]*

## Groundwater Resources

### Stable Isotope Stable Isotope Study, Butte County, California

**Geologist/Hydrogeologist.** Kristene was part of a team of hydrogeologists and isotope experts that compiled, organized, and assessed existing groundwater and surface water stable isotope data in Butte County. Using existing stable isotopes of water (δD and δO18 stable isotopes), the team evaluated existing data and developed a field sampling plan for Butte County to implement field work collecting four rounds of groundwater and surface water samples in existing groundwater monitoring wells from October 2015 to March 2017. These data demonstrated that streams sourced from 3,000 feet above sea level (fasl) exhibited distinct seasonality in stable isotope surface water data. Another finding suggests that these high elevation creeks and rivers are an important source of groundwater recharge in the upper 300-500 feet; below that depth low elevation (100 to 300 fasl) valley floor precipitation constitutes the majority of groundwater. Evaporation complicates identifying recharge source, especially when high elevation water is used for agricultural irrigation.

### Mine Permitting Support/Hydrogeologic Evaluation, CEMEX, Inc., Pleasanton, California

**Supervising Geologist/Hydrogeologist.** Kristene provided technical expertise on a gravel quarry expansion permitting for CEMEX, Inc. The client was proposing to expand the mining activities to a depth where the permitting agency believed a competent aquitard existed. BC compiled existing well logs from the site and locations in the vicinity. From these logs, BC prepared cross sections that helped evaluate whether the aquitard in question was present beneath the area where additional deeper mining activities were proposed. Kristene reviewed the logs and was responsible for the preparation and interpretation of the cross sections.

### Monitoring Well Installation, Sacramento Groundwater Authority (SGA), Sacramento, California

**Technical Advisor.** Kristene provided technical expertise for a project including the design and installation of two monitoring wells for SGA. The purpose of these wells was for enhancement of the monitoring network responsible for ensuring acceptable groundwater quality SGA jurisdiction. for the Kristene was primarily responsible for logging and being the responsible professional for the well logs. She provided geologic expertise in interpreting E-logs and correlating those logs to the core samples. Ultimately, the wells were installed to specification and are providing the intended function to SGA.

### Groundwater Basin Evaluation, Confidential Client, Northeastern California

**Technical Advisor.** Kristene provided technical expertise for a project including analysis for a county water management agency in northeastern California to determine the applicability of alternative monitoring approaches for compliance with the California Statewide Groundwater Elevation Monitoring (CASGEM) program. Six basins were evaluated and a report consistent with California Water Code requirements was prepared within five weeks to meet a legislated deadline. Kristene's role included assisting the expert level CHG in compiling groundwater level data and populating maps and data files, and performing preliminary analysis of the results. She assisted with report preparation and submittal to the client. Kristene's contribution helped deliver the client and excellent and innovative work product and at an approximate 10% cost savings to the client, largely due to Kristene's efficient use of time and effective task management.

*[Performed while at The Source Group, Inc. in 2012]*

### Water Rights Support, Confidential Client, Big Sur, California

**Technical Advisor.** Kristene provided technical support for a project supporting the Water Right Application process on behalf of a client for submittal to the State Water Resources Control Board (SWRCB) Division of Water Rights. To support the permitting process, this long-term, full scale watershed assessment project involved a wide ranging scope of work including installation of monitoring wells, water level monitoring in multiple wells, river stage monitoring, hourly river temperature monitoring, river water quality evaluations, monitoring of irrigation well pumping durations, and daily monitoring of water quality in water pumped from the wells.

*[Performed while at The Source Group, Inc. in 2010]*

## Solid Waste

### Waste Investigation, Confidential Client, California

**Project Manager.** BC is currently providing technical assistance for a historical illegal landfill site. The landfill materials were discovered during earthwork activities in preparation of the client building a new electrical substation. Kristene has taken on the role of project manager and Professional Geologist for this project. Currently, she is providing technical assistance with regards to Title 27 landfill regulations. A draft Partial Clean Closure Plan has been submitted to the Local Oversight Agency and Kristene was primarily responsible for the preparation of this plan. She also oversaw the planning and installation of a landfill gas monitoring network.

### Waste Handling/Capping Consulting, Confidential Client, California

**Project Manager.** BC is providing technical expertise regarding waste handling and/or capping for historic landfill on property where client operates a substation. Kristene has taken on the role of project manager and Professional Geologist for the project. Currently BC is in negotiation with the Local Enforcement Agency to collect delay providing a closure/post closure maintenance plan for a proposed landfill cap. The current

substation is scheduled to be decommissioned in approximately 4 years, and BC is supporting the clients' efforts to mitigate any interim risks (landfill gas

### Remedial Oversight and Hazardous Waste Removal/Disposal, Malcolm Drilling Co., South San Francisco, California

**Project Hydrogeologist.** Kristene planned and oversaw a remedial investigation and clean-up of a vacant site with a history of industrial use. Initial activities included digging of test pits at various locations at the site that had previous industrial uses. The analytical and physical results of those test pits indicated that waste had been buried at the site and this waste was contaminated with barium and lead, making it hazardous waste. Kristene then planned and oversaw the entire field effort which included excavation and disposal of over 5,000 cubic tons of hazardous waste. The planning and collection of confirmation soil samples was carried by Kristene. She authored the report documenting the removal.

*[Performed while at The Source Group, Inc. in 2010]*

## Organizations

Association of Groundwater Scientists and Engineers (National Ground Water Association)

Groundwater Resources Association of California

Appendix I

# Hydrology and Water Supply Studies

Appendix I.1

# Drainage Report for Gem Hill Quarry

# DRAINAGE REPORT

# FOR

# GEM HILL QUARRY

**February 22, 2022**

**Will sign and stamp upon approval**

**Wayne W. Chang, MS, PE 46548, Exp. 6/30/2023**


ChangConsultants

Civil Engineering ◦ Hydrology ◦ Hydraulics ◦ Sedimentation

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**FOR REVIEW ONLY**

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**APPENDIX**

A. Rational Method Data and Results

B. Retention Data

**MAP POCKET**

Rational Method Work Map

FOR REVIEW ONLY

## INTRODUCTION

CalPortland Company is proposing to permit the Gem Hill Quarry located on the west side of Mojave Tropico Road in Kern County (see the Vicinity Map). The site will be located within portions of Assessor's Parcel Numbers (APN) 345-294-17, 345-031-02, 345-032-05, and 345-032-31, which total 778.14 acres. The project site boundary is approximately 210 acres. In addition, the site's primary access road is within APN 345-032-02, which covers 76.36 acres. A secondary access road to the north is within APN 345-294-17, which covers 58.14 acres. The project proposes a rock quarry, north and south overburden stockpile areas, equipment storage, topsoil storage, a test plot area, five stormwater retention basins, parking, haul roads, and associated facilities.




**Vicinity Map**

Under existing (pre-project) conditions, the site is largely undisturbed. There are no significant impervious surfaces at the site and the undisturbed areas contain sparse vegetation common to semi-arid areas. Storm runoff occurs as surface flow in a generally southwest direction.

Under proposed (post-project) conditions, storm runoff will be conveyed along the natural terrain, proposed haul roads, or proposed drainage ditches to one of five retention basins identified as the west quarry basin, east quarry basin, north overburden basin, south overburden basin, and equipment basin (see the Rational Method Work Map in the map pocket). There are three design standards for retention basins. First, Kern County "Engineering Bulletin 11-02" requires retention basins to store the Intermediate Storm Design Discharge 5-day rainfall event from the impervious area. Second, the Industrial General Permit requires volume-based best management practices to be designed for the 85$^{th}$ percentile, 24-hour storm. The project took a more conservative approach than these two and used the maximum historic precipitation event to size the retention basins. This approach is similar to that used to address a Notice of Non-Applicability (NONA).

The National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Industrial Activities (General Permit – Order NPDES No. CAS000001) was adopted by the State Water Resources Control Board on April 1, 2014 and became effective July 1, 2015. The General Permit includes "No Discharge" eligibility requirements under which a facility would not be covered by the General Permit. The environmental consultant, ELMT Consulting, has determined that the facility is located in an area that is not hydrologically connected to waters of the United States. Therefore, it meets the No Discharge eligibility criteria.

This report contains hydrologic analyses for the proposed project and storm water volume calculations for the proposed retention basins. The Gem Hill Quarry has been designed to retain storm volumes in excess of the maximum historic rain event recorded by WRCC's three rain gages closest to the site. This exceeds the Kern County and Industrial General Permit requirements. Since the project incorporates retention, will not create any significant impervious areas, and will generally maintain runoff directions in the undisturbed areas, storm flows to off-site areas will be reduced and flood inundation impacts will not occur. This report also analyzes storm runoff tributary to the project's primary and secondary access roads.

## HYDROLOGIC RESULTS

*Rational Method Analysis*

Quarries are governed by the Surface Mining and Reclamation Act (SMARA) and SMARA Regulations. SMARA Regulations Section 3706 states that "Erosion control methods shall be designed to handle runoff from not less than the 20 year/1 hour intensity storm event." The Kern County *Hydrology Manual* includes 25-year data, which will yield conservative (higher than 20-year) results. A 25-year hydrologic analysis has been performed for existing and proposed conditions. The project will not create impervious surfaces and will retain storm runoff. Therefore, off-site flood inundation impacts will not occur. The overall study area covers 136.60 acres. This is less than 640 acres (1 square mile), so the Kern County *Hydrology Manual* rational method procedure was the basis for the analysis. The hydrologic input parameters are summarized below and the supporting data is included in Appendix A.

- Drainage area: The existing and proposed condition drainage basins were delineated from 5-foot contour interval topographic mapping and the mine plan provided by CalPortland Company. The initial subareas are less than 10 acres as required by the *Hydrology Manual.* The existing and proposed condition drainage basin boundaries and topographic information are included on the respective Rational Method Work Maps. The overall existing and proposed condition drainage areas were set equal to allow a comparison of results.

- Precipitation: The *Hydrology Manual* provides precipitation data based on NOAA Atlas 2. Kern County now requires analyses to be based on NOAA Atlas 14, Volume 6, Version 2, so these values were used.

- Hydrologic soil groups: The Web Soil Survey does not specify a hydrologic soil group at the site. However, the surrounding areas are either within hydrologic soil group A or A/D. Hydrologic soil group A was used for the analysis.

- Land use: The project will not create impervious surfaces and the surrounding area is natural, undeveloped land with sparse vegetation characteristic of the semi-arid region. An undeveloped (poor cover) land use was assigned for all subareas.

- Runoff coefficient: The runoff coefficient is the ratio of rate of runoff to the rate of rainfall at an average intensity when the total drainage area is contributing. The selection of the runoff coefficient depends on rainfall intensity, drainage area slope, type and amount of vegetative cover, infiltration capacity of the ground surface, and various other factors. The *Hydrology Manual* provides equations for calculating runoff coefficient based on related factors, which were used for the analyses.

- Flow lengths and elevations: The subarea flow lengths and elevations were obtained from the topographic mapping and mine plan. The initial flow paths are less than 1,000 feet as required by the *Hydrology Manual.*

The existing and proposed condition 25-year analyses were performed using the CivilDesign software, which incorporates the Kern County standards. The rational method results are included in Appendix A. The existing and proposed condition results are summarized in Table 1 and Table 2, respectively. Table 1 provides the existing condition 25-year flow rates for the seven project drainage basins. Table 2 provides the proposed condition 25-year flow rate tributary to each retention basin associated with a drainage basin as well as to the quarry, primary, and secondary access roads. The retention basins are intended to store the maximum historic precipitation, which is 3.25 inches (see discussion below). This is even greater than the 100-year, 1-hour precipitation of 0.974 inches.

The total existing condition 25-year flow rate from Table 1 is 212 cfs. Under proposed conditions, storm runoff will be retained on-site (see following section), so the downstream 25-year runoff will be reduced by approximately 169 cfs. Since the proposed retention basins and quarry are pervious, some stormwater will naturally infiltrate and recharge the groundwater basin. The retention can potentially increase recharge in the local area. The area is arid (less than 10 inches of annual rainfall), so the native vegetation requires minor and infrequent rainfall to

exist. Storm runoff will continue to be directed to the natural drainages downstream of the site. Table 1 and 2 show that storm runoff tributary to and along the primary access road up to the gated entrance and secondary access road is unchanged by the project, so no drainage facilities are proposed. Stormwater will continue to either sheet flow across and along the roads or cross the roads in natural swales.

| Location | Rational Method Node Number | Tributary Area, ac | 25-Year Flow Rate, cfs |
|---|---|---|---|
| West and East Quarry Basin + Quarry | 104[1] | 94.15[1] | 137 |
| North Overburden Basin | 402[2] | 8.67[2] | 12 |
| South Overburden Basin | 502[2] | 3.49[2] | 5.2 |
| Equipment Basin | 602[2] | 2.67[2] | 4.4 |
| Secondary Access Road | 704[3] | 26.55[3] | 42 |
| Primary Access Road | 714[4] | 1.07[4] | 1.2 |
| Primary Access Road at Gate | 724[5] | 6.77[5] | 10 |

[1]The 94.15 acres tributary to Node 104 include 2.83 acres at Node 102 and 91.32 acres at Node 104.
[2]Nodes 402, 502, and 602 have a single drainage subarea.
[3]The 26.55 acres tributary to Node 704 include 2.01 acres at Node 702 and 24.54 acres at Node 704.
[4]The 1.07 acres tributary to Node 714 include 0.23 acres at Node 712 and 0.84 acres at Node 714.
[5]The 6.77 acres tributary to Node 724 include 2.54 acres at Node 722 and 4.23 acres at Node 724.

**Table 1. Existing Condition Rational Method Results Summary**

| Location | Rational Method Node Number | Tributary Area, ac | 25-Year Flow Rate, cfs |
|---|---|---|---|
| West Quarry Basin | 104[1] | 26.46[1] | 49 |
| East Quarry Basin | 304[2] | 18.80[2] | 24 |
| Quarry | 206[3] | 42.12[3] | 37 |
| North Overburden Basin | 404[4] | 8.67[4] | 7.6 |
| South Overburden Basin | 502[5] | 3.49[5] | 6.2 |
| Equipment Basin | 602[5] | 2.67[5] | 4.8 |
| Secondary Access Road | 704[6] | 26.55[6] | 42 |
| Primary Access Road | 714[7] | 1.07[7] | 1.2 |

[1]The 26.46 acres tributary to Node 104 include 0.79 acres at Node 102 and 25.67 acres at Node 104.
[2]The 18.80 acres tributary to Node 304 include 2.76 acres at Node 302 and 16.04 acres at Node 304.
[3]The 42.12 acres tributary to Node 206 include 1.41 acres at Node 202, 4.32 acres at Node 204, 34.79 acres at Node 206, and 1.60 acres at Node 208.
[4]The 8.67 acres tributary to Node 404 include 1.68 acres at Node 402 and 6.99 acres at Node 304.
[5]Nodes 502 and 602 have a single drainage subarea.
[6]The 26.55 acres tributary to Node 704 include 2.01 acres at Node 702 and 24.54 acres at Node 704.
[7]The 1.07 acres tributary to Node 714 include 0.23 acres at Node 712 and 0.84 acres at Node 714.

**Table 2. Proposed Condition Rational Method Results Summary**

*Retention Analyses*

The three retention criteria discussed in the Introduction have been assessed. First, Kern County "Engineering Bulletin 11-02" is based on the Intermediate Storm Design Discharge 5-day rainfall event from impervious areas. The project does not propose impervious areas, so there are no associated volumes. Second, the Industrial General Permit is based on the 85th percentile, 24-hour storm, which represents an event in which 85 percent will be less (and 15 percent will be larger). This rainfall amount is smaller than the maximum precipitation event, so the Industrial General Permit criteria will result in smaller volumes than the maximum precipitation event. The project has been designed for the maximum precipitation event volumes.

Engineering analyses were performed to determine the retention volumes needed to contain the maximum historic precipitation event. The runoff volume from a precipitation event is determined by the equation:

$V = P/12 \times A \times C$ where, V = maximum precipitation volume, acre-feet
P = maximum precipitation event, inches
A = tributary area, acres
C = runoff coefficient, dimensionless

The following discusses the three input parameters and the associated values.

The maximum historic precipitation data closest to the site was obtained from the Western Regional Climate Center (WRCC), which is administered by NOAA. The US COOP Station Map is included in Appendix B and shows the three rain gages closest to the site. The Mojave gage contains data from January 1, 1904 to June 08, 2016. The gage data is included in Appendix B and contains the maximum daily precipitation over this time period. The highest daily value is 3.00 inches, which occurred on January 30, 1915. The Mojave 2 ESE gage contains data from April 1, 1963 to June 30, 1969. The highest daily value is 3.25 inches, which occurred on November 19, 1967. The Backus RCH gage contains data from June 1, 1936 to February 28, 1963. The highest daily value is 2.81 inches, which occurred on December 11, 1943.

The aforementioned data represents the daily maximums, while the General Permit specifies the maximum "precipitation event," which could extend over more than one day. In order to determine the maximum precipitation event recorded at each of the three gages, the maximum monthly precipitation data was obtained from the WRCC (see Appendix B). The results show that the maximum monthly precipitation at each gage equals the daily maximum, i.e., the maximum storm event precipitation measured each of the three gages is represented by the maximum daily precipitation. The Mojave 2 ESE gage recorded the greatest precipitation event value of 3.25 inches, so this value was used for the retention analyses. A Summary-of-the-Day Graph is included in Appendix B and confirms that the 3.25 inches on November 19, 1967 is also the total rainfall in November 1967.

The tributary area for each of the five retention basins has been delineated on the Rational Method Work Map.

The runoff coefficient represents the portion of rainfall that will be conveyed over the ground surface versus infiltrating. Equation D.4 from the *Hydrology Manual* contains equations for determining the runoff coefficient. The runoff coefficient calculations are included in Appendix B and determined a C value of 0.55 for the entire project site.

Table 3 summarizes the P, A, and C values for each retention basin and the quarry along with the resulting precipitation volumes. The storage provided by each retention basin is also listed. The quarry volume will gradually increase over time as mining progresses. The quarry floor will ultimately cover nearly 10 acres and the depth will be over 200 feet, so the storage volume will be well in excess of 2,000 acre-feet when the side slopes are considered. Table 2 shows that the quarry, north overburden basin, south overburden basin, and equipment basin can retain the maximum historic precipitation event. The maximum historic precipitation exceeds the storage in the west quarry basin and east quarry basin. However, the overflow from these basins is directed into the quarry along the haul roads, so the runoff will remain on-site.

The haul roads will have a cross slope that causes the overflow to be conveyed to the quarry along the inward side of the haul roads. Safety berms will confine runoff within the haul roads and prevent overtopping onto adjacent downward slopes. The maximum 25-year flow rate along the quarry haul road assuming no retention is 110 cfs from the combined west quarry, east quarry, and main quarry flows from Table 2. A quarry haul road normal depth analysis using FlowMaster is included after this text and shows that the flow depth is 5.3 inches, which can be conveyed within the haul road. The flow velocity is 7.9 feet per second. The site is a hard rock quarry, so the natural surface will resist erosion from this velocity and provide energy dissipation. Cobble, gravel, or other lining can be installed along road edges in areas requiring additional erosion protection. The analysis is based on the final quarry condition, which will be the most conservative in terms of flow rate, i.e., the greatest flow rate will occur on the haul road upon mining completion.

| Location | Max. Precip., Inches | Tributary Area, ac | Runoff Coefficient, C | Max. Precip. Vol., ac-ft | Provided Vol., ac-ft |
|---|---|---|---|---|---|
| West Quarry Basin | 3.25 | 26.46 | 0.55 | 3.94 | 2.61 |
| East Quarry Basin | 3.25 | 18.80 | 0.55 | 2.80 | 1.73 |
| Quarry | 3.25 | 42.12 | 0.55 | 6.27 | > 2,000 |
| North Overburden Basin | 3.25 | 8.67 | 0.55 | 1.29 | 1.67 |
| South Overburden Basin | 3.25 | 3.49 | 0.55 | 0.52 | 1.93 |
| Equipment Basin | 3.25 | 2.67 | 0.55 | 0.40 | 0.42 |

**Table 3. Rainfall and Storage Volume Summary**

## CONCLUSION

The Gem Hill Quarry will incorporate conveyance and erosion control measures per SMARA criteria. The SMARA runoff is calculated from Kern County criteria. The measures will be documented in the Industrial SWPPP.

The project is a hard rock quarry, so the natural surface (slopes, haul roads, and pads) will resist erosion. Safety berms will be installed along the top of slopes per Mine Safety and Health Administration guidelines (berms shall be at least mid-axle height of the largest self-propelled mobile equipment which usually travels the roadway). Berms will prevent storm runoff from overtopping the top of slopes. The haul roads will be constructed with a cross-slope that directs storm runoff to the inward side of the haul roads. This will allow runoff to be conveyed along the edge of the haul roads and prevent runoff onto adjacent downward slopes.

Storm runoff along the primary access road leading to the gated entrance and secondary access road will remain the same as under pre-project conditions.

The Gem Hill Quarry has been also been designed to retain storm volumes from the industrial operations areas meeting the maximum historic rain event recorded by WRCC's three rain gages closest to the site. Since the project incorporates retention, will not create any significant impervious areas, and will generally maintain runoff directions in the undisturbed areas, storm flows to off-site areas will be reduced and flood inundation impacts will not occur.

Table 4 summarizes the conveyance, erosion control, and retention standards.

| Analysis | Location | Regulatory Basis | Storm Event and Duration |
|---|---|---|---|
| Conveyance and Erosion Control | Entire Study Area | SMARA and Kern County | 20-Year, 1-Hour Required (25-Year, 1-Hour Calculated) |
| Retention Storage Capacity | West Quarry Basin | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |
| Retention Storage Capacity | East Quarry Basin | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |
| Retention Storage Capacity | Quarry | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |
| Retention Storage Capacity | North Overburden Basin | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |
| Retention Storage Capacity | South Overburden Basin | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |
| Retention Storage Capacity | Equipment Basin | Notice of Non-Applicability | Maximum Precipitation from a Historic Storm Event |

**Table 4. Summary of Storm Water Standards**

# Worksheet for Haul Road

| Project Description | |
|---|---|
| Friction Method | Manning Formula |
| Solve For | Normal Depth |

| Input Data | |
|---|---|
| Roughness Coefficient | 0.030 |
| Channel Slope | 0.078 ft/ft |
| Left Side Slope | 2.000 H:V |
| Right Side Slope | 2.000 H:V |
| Bottom Width | 30.00 ft |
| Discharge | 110.00 cfs |

| Results | |
|---|---|
| Normal Depth | 5.4 in |
| Flow Area | 13.9 ft² |
| Wetted Perimeter | 32.0 ft |
| Hydraulic Radius | 5.2 in |
| Top Width | 31.80 ft |
| Critical Depth | 8.8 in |
| Critical Slope | 0.015 ft/ft |
| Velocity | 7.93 ft/s |
| Velocity Head | 0.98 ft |
| Specific Energy | 1.43 ft |
| Froude Number | 2.115 |
| Flow Type | Supercritical |

| GVF Input Data | |
|---|---|
| Downstream Depth | 0.0 in |
| Length | 0.0 ft |
| Number Of Steps | 0 |

| GVF Output Data | |
|---|---|
| Upstream Depth | 0.0 in |
| Profile Description | N/A |
| Profile Headloss | 0.00 ft |
| Downstream Velocity | Infinity ft/s |
| Upstream Velocity | Infinity ft/s |
| Normal Depth | 5.4 in |
| Critical Depth | 8.8 in |
| Channel Slope | 0.078 ft/ft |
| Critical Slope | 0.015 ft/ft |

# APPENDIX A

## RATIONAL METHOD
## DATA AND RESULTS

**NOAA Atlas 14, Volume 6, Version 2**
**Location name: Rosamond, California, USA***
**Latitude: 34.9194°, Longitude: -118.2188°**
**Elevation: 2695.83 ft****
* source: ESRI Maps
** source: USGS

**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

## PF tabular

**PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]**

| Duration | Average recurrence interval (years) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 5 | 10 | 25 | 50 | 100 | 200 | 500 | 1000 |
| 5-min | 0.068 (0.056-0.083) | 0.088 (0.073-0.108) | 0.118 (0.097-0.146) | 0.146 (0.119-0.181) | 0.188 (0.148-0.241) | 0.224 (0.173-0.293) | 0.265 (0.200-0.356) | 0.312 (0.229-0.431) | 0.392 (0.275-0.563) | 0.520 (0.353-0.774) |
| 10-min | 0.098 (0.080-0.119) | 0.127 (0.104-0.155) | 0.170 (0.139-0.209) | 0.209 (0.170-0.259) | 0.269 (0.212-0.345) | 0.321 (0.248-0.420) | 0.380 (0.286-0.510) | 0.447 (0.328-0.617) | 0.561 (0.394-0.807) | 0.745 (0.506-1.11) |
| 15-min | 0.118 (0.097-0.144) | 0.153 (0.126-0.188) | 0.205 (0.169-0.253) | 0.253 (0.206-0.313) | 0.325 (0.256-0.417) | 0.388 (0.300-0.508) | 0.460 (0.346-0.616) | 0.541 (0.396-0.746) | 0.679 (0.477-0.976) | 0.901 (0.612-1.34) |
| 30-min | 0.159 (0.131-0.195) | 0.207 (0.170-0.253) | 0.277 (0.227-0.341) | 0.341 (0.278-0.422) | 0.439 (0.346-0.562) | 0.524 (0.404-0.685) | 0.620 (0.467-0.831) | 0.730 (0.534-1.01) | 0.915 (0.643-1.32) | 1.22 (0.825-1.81) |
| 60-min | 0.225 (0.185-0.275) | 0.292 (0.240-0.358) | 0.391 (0.321-0.481) | 0.481 (0.392-0.596) | 0.619 (0.488-0.794) | 0.739 (0.571-0.968) | 0.875 (0.659-1.17) | 1.03 (0.755-1.42) | 1.29 (0.908-1.86) | 1.72 (1.17-2.55) |
| 2-hr | 0.344 (0.284-0.422) | 0.438 (0.361-0.538) | 0.572 (0.469-0.703) | 0.688 (0.560-0.853) | 0.858 (0.676-1.10) | 1.00 (0.772-1.31) | 1.15 (0.869-1.55) | 1.32 (0.969-1.82) | 1.57 (1.10-2.26) | 1.78 (1.21-2.64) |
| 3-hr | 0.431 (0.356-0.528) | 0.548 (0.452-0.673) | 0.711 (0.584-0.874) | 0.851 (0.693-1.06) | 1.05 (0.828-1.35) | 1.22 (0.937-1.59) | 1.39 (1.05-1.86) | 1.58 (1.16-2.17) | 1.85 (1.30-2.65) | 2.07 (1.40-3.07) |
| 6-hr | 0.588 (0.485-0.720) | 0.759 (0.625-0.931) | 0.989 (0.813-1.22) | 1.18 (0.963-1.47) | 1.45 (1.14-1.86) | 1.66 (1.28-2.18) | 1.88 (1.42-2.53) | 2.12 (1.55-2.92) | 2.44 (1.71-3.50) | 2.69 (1.83-4.01) |
| 12-hr | 0.727 (0.599-0.890) | 1.00 (0.827-1.23) | 1.37 (1.12-1.68) | 1.66 (1.35-2.06) | 2.06 (1.62-2.64) | 2.36 (1.82-3.09) | 2.67 (2.01-3.58) | 2.99 (2.19-4.12) | 3.41 (2.40-4.91) | 3.74 (2.54-5.57) |
| 24-hr | 0.917 (0.814-1.05) | 1.35 (1.20-1.56) | 1.92 (1.69-2.21) | 2.37 (2.08-2.76) | 2.98 (2.53-3.59) | 3.45 (2.86-4.24) | 3.92 (3.17-4.94) | 4.39 (3.46-5.70) | 5.03 (3.80-6.81) | 5.52 (4.02-7.74) |
| 2-day | 1.14 (1.01-1.31) | 1.64 (1.45-1.89) | 2.31 (2.05-2.67) | 2.87 (2.52-3.34) | 3.64 (3.09-4.39) | 4.25 (3.53-5.22) | 4.87 (3.94-6.14) | 5.52 (4.35-7.16) | 6.42 (4.85-8.69) | 7.13 (5.20-9.99) |
| 3-day | 1.29 (1.14-1.48) | 1.83 (1.62-2.11) | 2.57 (2.27-2.97) | 3.19 (2.80-3.71) | 4.06 (3.44-4.89) | 4.75 (3.95-5.85) | 5.48 (4.44-6.91) | 6.25 (4.92-8.11) | 7.33 (5.53-9.91) | 8.20 (5.97-11.5) |
| 4-day | 1.38 (1.23-1.59) | 1.95 (1.73-2.25) | 2.73 (2.42-3.15) | 3.39 (2.97-3.94) | 4.32 (3.66-5.19) | 5.05 (4.19-6.22) | 5.83 (4.72-7.35) | 6.66 (5.24-8.63) | 7.82 (5.90-10.6) | 8.75 (6.38-12.3) |
| 7-day | 1.53 (1.36-1.76) | 2.15 (1.91-2.48) | 2.99 (2.65-3.46) | 3.70 (3.24-4.31) | 4.68 (3.97-5.64) | 5.46 (4.53-6.71) | 6.26 (5.07-7.90) | 7.11 (5.60-9.22) | 8.29 (6.25-11.2) | 9.22 (6.72-12.9) |
| 10-day | 1.59 (1.41-1.82) | 2.23 (1.98-2.57) | 3.11 (2.75-3.58) | 3.83 (3.36-4.46) | 4.84 (4.10-5.82) | 5.62 (4.67-6.91) | 6.43 (5.21-8.11) | 7.28 (5.73-9.44) | 8.45 (6.37-11.4) | 9.36 (6.82-13.1) |
| 20-day | 1.88 (1.67-2.16) | 2.66 (2.36-3.06) | 3.72 (3.28-4.29) | 4.59 (4.02-5.34) | 5.80 (4.92-6.98) | 6.75 (5.60-8.30) | 7.72 (6.25-9.73) | 8.73 (6.87-11.3) | 10.1 (7.63-13.7) | 11.2 (8.15-15.7) |
| 30-day | 2.15 (1.91-2.48) | 3.06 (2.71-3.52) | 4.28 (3.79-4.95) | 5.30 (4.65-6.17) | 6.72 (5.70-8.09) | 7.83 (6.50-9.63) | 8.98 (7.27-11.3) | 10.2 (8.00-13.2) | 11.8 (8.90-16.0) | 13.1 (9.52-18.3) |
| 45-day | 2.60 (2.31-2.99) | 3.69 (3.28-4.25) | 5.17 (4.57-5.97) | 6.42 (5.62-7.47) | 8.15 (6.91-9.82) | 9.53 (7.91-11.7) | 10.9 (8.86-13.8) | 12.4 (9.78-16.1) | 14.5 (10.9-19.6) | 16.1 (11.7-22.5) |
| 60-day | 2.92 (2.59-3.35) | 4.12 (3.65-4.74) | 5.77 (5.10-6.66) | 7.16 (6.27-8.33) | 9.11 (7.72-11.0) | 10.7 (8.84-13.1) | 12.3 (9.93-15.5) | 13.9 (11.0-18.1) | 16.3 (12.3-22.0) | 18.1 (13.2-25.4) |

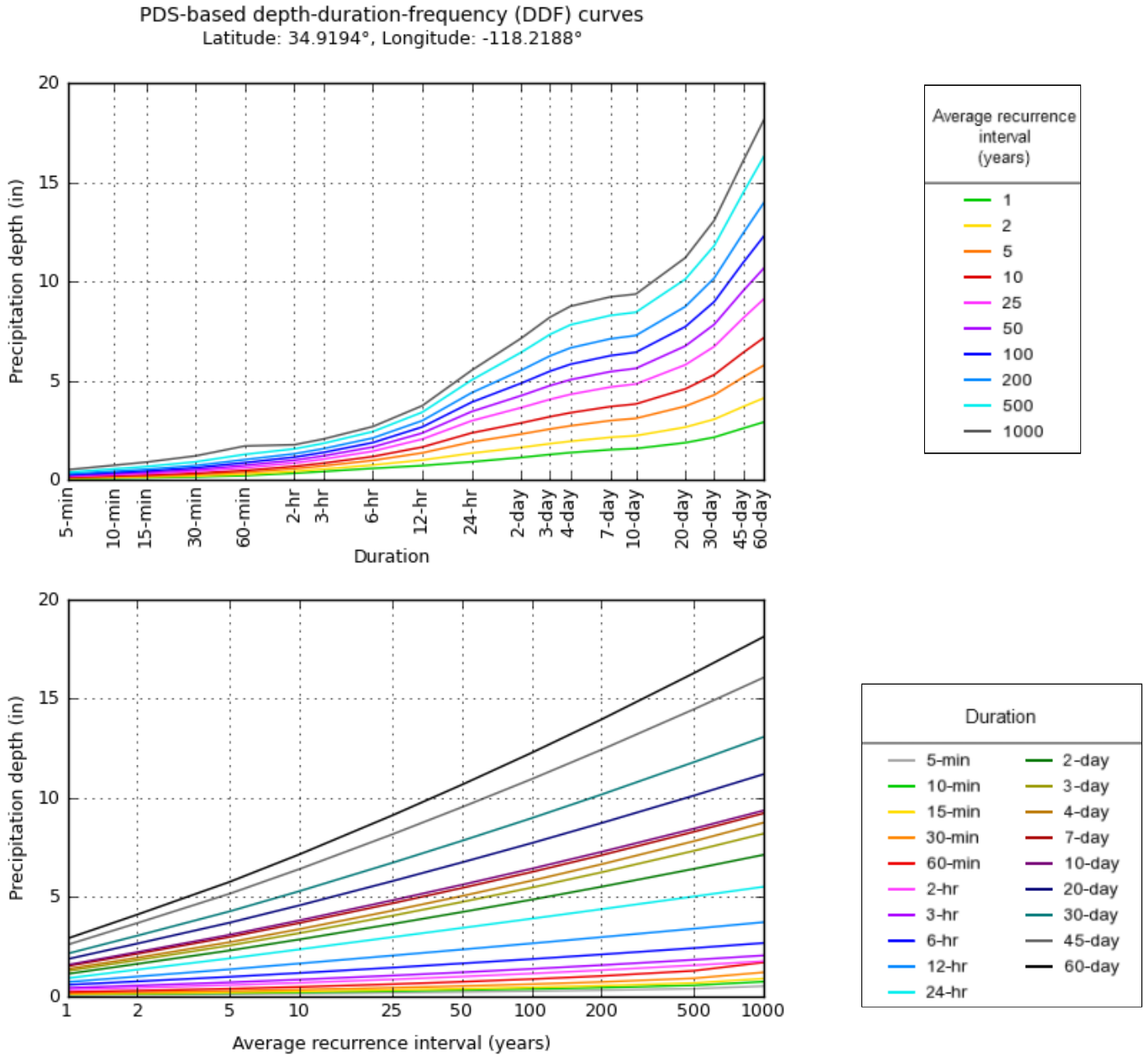
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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## PF graphical




NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Thu Aug 6 18:57:46 2020

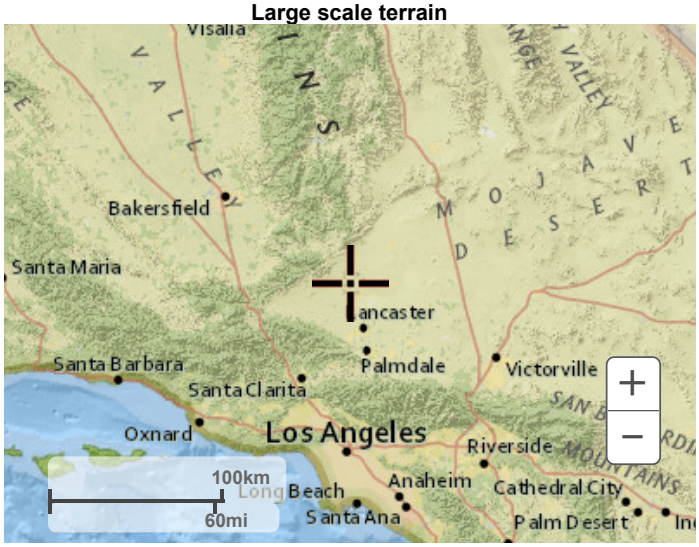
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## Maps & aerials

**Small scale terrain**




**Large scale terrain**




**Large scale map**




**Large scale aerial**

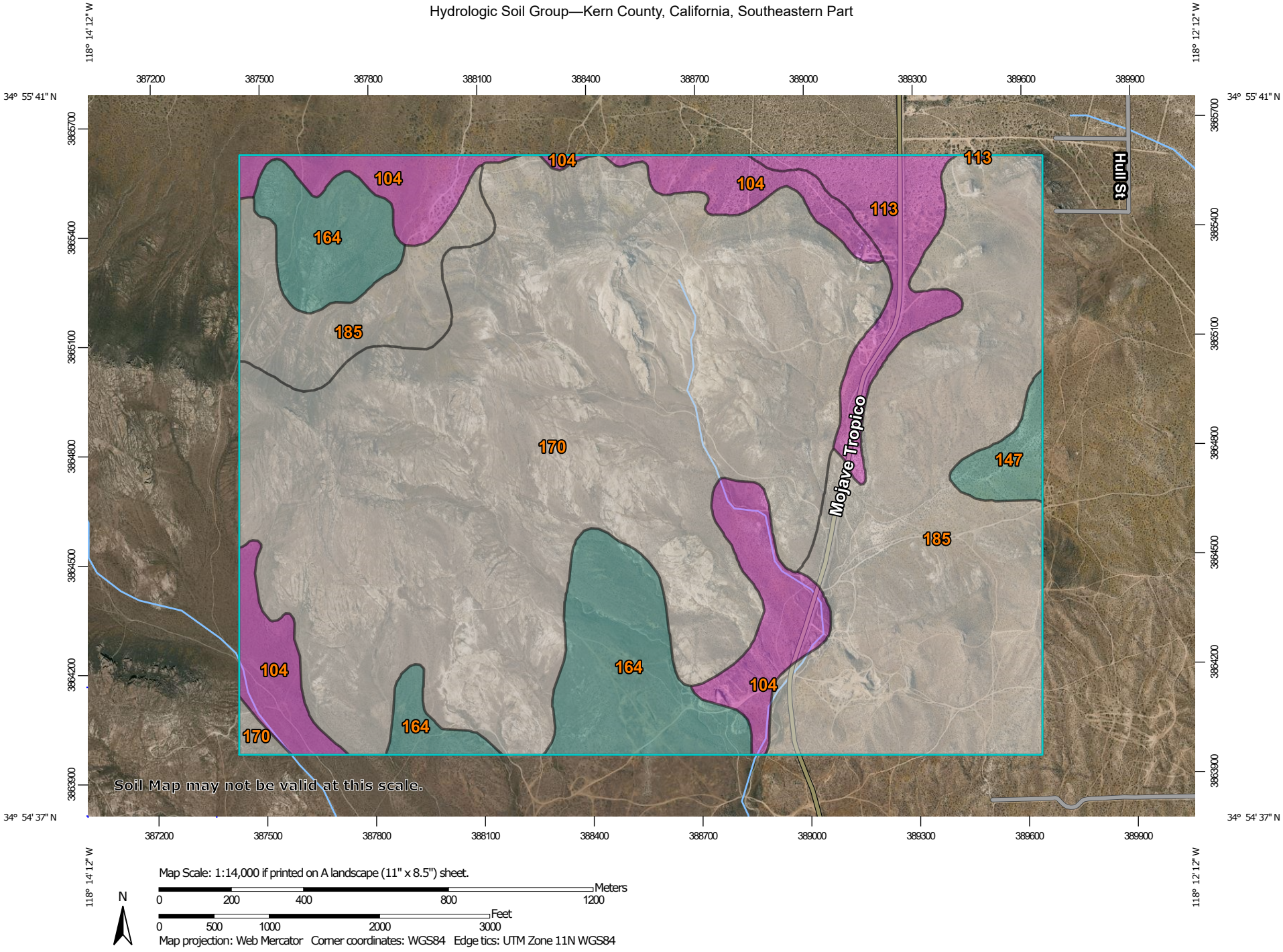



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer


118° 14' 12" W
118° 12' 12" W
34° 55' 41" N
34° 54' 37" N
387200
387500
387800
388100
388400
388700
389000
389300
389600
389900
3865700
3865400
3865100
3864800
3864500
3864200
3863900
104
113
164
185
170
147
Hull St
Mojave Tropico
Soil Map may not be valid at this scale.
Map Scale: 1:14,000 if printed on A landscape (11" x 8.5") sheet.
N
0 200 400 800 1200 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Lines**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Soil Rating Points**

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Kern County, California, Southeastern Part
Survey Area Data: Version 11, May 27, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 8, 2019—Apr 13, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Hydrologic Soil Group

| Map unit symbol | Map unit name | Rating | Acres in AOI | Percent of AOI |
|---|---|---|---|---|
| 104 | Arizo gravelly loamy sand, 2 to 9 percent slopes | A | 82.0 | 9.1% |
| 113 | Cajon sand, 5 to 15 percent slopes | A | 34.9 | 3.9% |
| 147 | Hi Vista sandy loam, 2 to 9 percent slopes | C | 11.2 | 1.2% |
| 164 | Porterville cobbly clay, 5 to 9 percent slopes | C | 86.6 | 9.6% |
| 170 | Rock outcrop | | 452.9 | 50.1% |
| 185 | Torriorthents-Rock outcrop complex, very steep | | 236.5 | 26.2% |
| **Totals for Area of Interest** | | | **904.1** | **100.0%** |

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff: None Specified*

*Tie-break Rule:* Higher

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 2007 Version 7.5
Rational Hydrology Study Date: 02/23/22 File: exist.out

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**Gem Hill**
**Existing Conditions**
**25-Year Storm Event**

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Program License Serial Number 4028

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********* Hydrology Study Control Information **********

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ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data: Year Storm Hour Rainfall

| | | |
|---|---|---|
| 2 | 6 | 0.759(In.) |
| 2 | 24 | 1.350(In.) |
| 100 | 6 | 1.880(In.) |
| 100 | 24 | 3.920(In.) |

Latitude in degrees = 34.92
COAST RANGES area of study
Y2 = 0.344, Y100 = 0.974 or Y100 = 0.973
Slope used for rainfall intensity curve b = 0.5500

Remaining year storm values:

| 1 Hour Rainfall - | Year Storm |
|---|---|
| 0.344 | 2 |
| 0.499 | 5 |
| 0.603 | 10 |
| 0.737 | 25 |
| 0.859 | 50 |
| 0.974 | 100 |

| 24 Hour Rainfall - | Year Storm |
|---|---|
| 1.350 | 2 |
| 1.985 | 5 |
| 2.405 | 10 |
| 2.953 | 25 |
| 3.451 | 50 |
| 3.920 | 100 |

Note: Computer estimated pipe sizes use 25 year storm flow rates

```
NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      100.000 to Point      102.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   517.000(Ft.)
Top (of initial area) elevation =  3041.000(Ft.)
Bottom (of initial area) elevation =  2845.000(Ft.)
Difference in elevation =   196.000(Ft.)
Slope =    0.37911  s(%)=      37.91
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.759 min.
Rainfall intensity =      3.001(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.705(CFS)
Subarea runoff =      5.967(CFS)
Total initial stream area =        2.830(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.8    7.76     1.54      0.66   0.05     0.2   2.2   2.2
  10    2.8    7.76     1.86      0.66   0.09     0.4   3.1   3.1
  25    2.8    7.76     2.27      0.66   0.14     0.8   4.1   4.1
  50    2.8    7.76     2.65      0.66   0.18     1.2   5.1   5.1
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      102.000 to Point      104.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2845.00(Ft.)
Downstream point elevation =   2670.00(Ft.)
Channel length thru subarea  =   2103.00(Ft.)
Channel Slope = 0.0832 Ft/Ft
Channel base width    =    5.000(Ft.)
Slope or 'Z' of left channel bank =   3.000
Slope or 'Z' of right channel bank =   3.000
Estimated mean flow rate at midpoint of channel =    102.234(CFS)
Manning's 'N'    = 0.040
```

```
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =    102.234(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   1.233(Ft.), Average velocity =   9.528(Ft/s)
Channel flow top width =   12.400(Ft.)
Flow Velocity =    9.53(Ft/s)
Travel time  =    3.68 min.
Time of concentration =   11.44 min.
Critical depth =      1.688(Ft.)
 Adding area flow to channel
UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 51.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.808(In/Hr), Fp = 0.808(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.088
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.091
Area averaged Fm = 0.803(In/Hr), Area Averaged Fp = 0.803(In/Hr)
Minimum Q (Qmin=0.9YIA) =  18.707(CFS)
Rainfall intensity =      2.424(In/Hr) for a 100 year storm
Subarea runoff =    131.338(CFS) for   91.320(Ac.)
Total runoff =    137.304(CFS)   Total area =       94.15(Ac.)
----------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5   94.1   13.73     1.12      0.80   0.00     0.0  27.2  27.2
  10   94.1   13.04     1.39      0.80   0.01     1.3  50.1  50.1
  25   94.1   12.24     1.77      0.80   0.04     5.4  81.6  81.6
  50   94.1   11.78     2.10      0.80   0.06    11.4 110.1 110.1
----------------------------------------------------------------
----------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.520(Ft.), Average velocity =   5.929(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.727(Ft.), Average velocity =   7.143(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.943(Ft.), Average velocity =   8.232(Ft/s)
** 50 year storm **
Depth of flow =   1.102(Ft.), Average velocity =   8.961(Ft/s)
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      400.000 to Point      402.000
**** INITIAL AREA EVALUATION ****
```

```
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   994.000(Ft.)
Top (of initial area) elevation =  2794.000(Ft.)
Bottom (of initial area) elevation =  2697.000(Ft.)
Difference in elevation =    97.000(Ft.)
Slope =    0.09759  s(%)=       9.76
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.220 min.
Rainfall intensity =      2.238(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   3.897(CFS)
Subarea runoff =     12.331(CFS)
Total initial stream area =        8.670(Ac.)
```

*******  DATA FOR OTHER YEAR STORMS *******

| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
|---|---|---|---|---|---|---|---|---|
| 5 | 8.7 | 13.22 | 1.15 | 0.66 | 0.05 | 0.4 | 3.8 | 3.8 |
| 10 | 8.7 | 13.22 | 1.38 | 0.66 | 0.09 | 1.0 | 5.7 | 5.7 |
| 25 | 8.7 | 13.22 | 1.69 | 0.66 | 0.14 | 1.8 | 8.1 | 8.1 |
| 50 | 8.7 | 13.22 | 1.97 | 0.66 | 0.18 | 2.8 | 10.3 | 10.3 |

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      500.000 to Point      502.000
**** INITIAL AREA EVALUATION ****
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   718.000(Ft.)
Top (of initial area) elevation =  2711.000(Ft.)
Bottom (of initial area) elevation =  2664.000(Ft.)
Difference in elevation =    47.000(Ft.)
Slope =    0.06546  s(%)=       6.55
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.572 min.
```

```
Rainfall intensity =      2.301(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.612(CFS)
Subarea runoff =      5.161(CFS)
Total initial stream area =        3.490(Ac.)
---------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    3.5   12.57     1.18      0.66   0.05     0.2   1.6   1.6
  10    3.5   12.57     1.42      0.66   0.09     0.4   2.4   2.4
  25    3.5   12.57     1.74      0.66   0.14     0.8   3.4   3.4
  50    3.5   12.57     2.03      0.66   0.18     1.2   4.3   4.3
---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      600.000 to Point      602.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   459.000(Ft.)
Top (of initial area) elevation =  2695.000(Ft.)
Bottom (of initial area) elevation =  2669.000(Ft.)
Difference in elevation =    26.000(Ft.)
Slope =    0.05664  s(%)=       5.66
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.821 min.
Rainfall intensity =      2.499(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.340(CFS)
Subarea runoff =      4.424(CFS)
Total initial stream area =        2.670(Ac.)
---------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.7   10.82     1.28      0.66   0.05     0.2   1.5   1.5
  10    2.7   10.82     1.55      0.66   0.09     0.3   2.1   2.1
  25    2.7   10.82     1.89      0.66   0.14     0.6   3.0   3.0
  50    2.7   10.82     2.20      0.66   0.18     1.0   3.7   3.7
---------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      700.000 to Point      702.000
```

```
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   476.000(Ft.)
Top (of initial area) elevation =  2850.000(Ft.)
Bottom (of initial area) elevation =  2765.000(Ft.)
Difference in elevation =    85.000(Ft.)
Slope =    0.17857  s(%)=      17.86
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.726 min.
Rainfall intensity =      2.813(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.135(CFS)
Subarea runoff =      3.898(CFS)
Total initial stream area =        2.010(Ac.)
---------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.0    8.73     1.44      0.66   0.05     0.1   1.4   1.4
  10    2.0    8.73     1.74      0.66   0.09     0.3   2.0   2.0
  25    2.0    8.73     2.13      0.66   0.14     0.5   2.7   2.7
  50    2.0    8.73     2.48      0.66   0.18     0.8   3.3   3.3
---------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      702.000 to Point      704.000
**** IMPROVED CHANNEL TRAVEL TIME ****
_____________________________________________________________________
Upstream point elevation =   2765.00(Ft.)
Downstream point elevation =   2701.00(Ft.)
Channel length thru subarea  =    762.00(Ft.)
Channel Slope = 0.0840 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   5.000
Slope or 'Z' of right channel bank =   5.000
Estimated mean flow rate at midpoint of channel =     27.693(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     27.693(CFS)
Depth of flow =   0.288(Ft.), Average velocity =   4.487(Ft/s)
Channel flow top width =   22.879(Ft.)
Flow Velocity =    4.49(Ft/s)
Travel time  =    2.83 min.
```

```
Time of concentration =   11.56 min.
Critical depth =      0.379(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =  12.848(CFS)
Rainfall intensity =      2.410(In/Hr) for a 100 year storm
Subarea runoff =     37.969(CFS) for   24.540(Ac.)
Total runoff =     41.867(CFS)   Total area =       26.55(Ac.)
----------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5   26.5   13.87     1.12      0.66   0.05     1.3  11.0  11.0
  10   26.5   13.17     1.39      0.66   0.09     2.9  17.4  17.4
  25   26.5   12.37     1.76      0.66   0.14     5.9  26.2  26.2
  50   26.5   11.90     2.09      0.66   0.18     9.2  34.2  34.2
----------------------------------------------------------------
----------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.130(Ft.), Average velocity =   2.705(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.171(Ft.), Average velocity =   3.228(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.218(Ft.), Average velocity =   3.770(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.256(Ft.), Average velocity =   4.165(Ft/s)
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      710.000 to Point      712.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
```

```
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   319.000(Ft.)
Top (of initial area) elevation =  2720.000(Ft.)
Bottom (of initial area) elevation =  2679.000(Ft.)
Difference in elevation =    41.000(Ft.)
Slope =    0.12853  s(%)=      12.85
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.941 min.
Rainfall intensity =      2.963(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   0.137(CFS)
Subarea runoff =      0.477(CFS)
Total initial stream area =        0.230(Ac.)
```

| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
|---|---|---|---|---|---|---|---|---|
| 5 | 0.2 | 7.94 | 1.52 | 0.66 | 0.05 | 0.0 | 0.2 | 0.2 |
| 10 | 0.2 | 7.94 | 1.83 | 0.66 | 0.09 | 0.0 | 0.2 | 0.2 |
| 25 | 0.2 | 7.94 | 2.24 | 0.66 | 0.14 | 0.1 | 0.3 | 0.3 |
| 50 | 0.2 | 7.94 | 2.61 | 0.66 | 0.18 | 0.1 | 0.4 | 0.4 |

*******  DATA FOR OTHER YEAR STORMS *******

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      712.000 to Point      714.000
**** IMPROVED CHANNEL TRAVEL TIME ****
_____________________________________________________________________
Upstream point elevation =   2679.00(Ft.)
Downstream point elevation =   2635.00(Ft.)
Channel length thru subarea  =    727.00(Ft.)
Channel Slope = 0.0605 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =      1.348(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      1.348(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.053(Ft.), Average velocity =   1.276(Ft/s)
Channel flow top width =   20.210(Ft.)
Flow Velocity =    1.28(Ft/s)
Travel time  =    9.49 min.
Time of concentration =   17.43 min.
Critical depth =      0.052(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   0.413(CFS)
Rainfall intensity =      1.922(In/Hr) for a 100 year storm
Subarea runoff =      0.741(CFS) for    0.840(Ac.)
Total runoff =      1.218(CFS)   Total area =        1.07(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    1.1   20.92     0.89      0.66   0.05     0.0   0.2   0.2
  10    1.1   19.87     1.11      0.66   0.09     0.1   0.4   0.4
  25    1.1   18.65     1.40      0.66   0.14     0.2   0.7   0.7
  50    1.1   17.96     1.67      0.66   0.18     0.3   1.0   1.0
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.019(Ft.), Average velocity =   0.651(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.028(Ft.), Average velocity =   0.845(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 10 minutes.
Depth of flow =   0.038(Ft.), Average velocity =   1.033(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 10 minutes.
Depth of flow =   0.046(Ft.), Average velocity =   1.167(Ft/s)
------------------------------------------------------------------
End of computations, total study area =         136.600 (Ac.)
```

Kern County Rational Hydrology Program

(Hydrology Manual Dated 1992)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 2007 Version 7.5
Rational Hydrology Study Date: 02/23/22 File: prop.out

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**Gem Hill**
**Proposed Conditions**
**25-Year Storm Event**

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Program License Serial Number 4028

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********* Hydrology Study Control Information **********

---

ENGLISH UNITS USED FOR RAINFALL DATA

Rainfall map data: Year Storm Hour Rainfall

| | | |
|---|---|---|
| 2 | 6 | 0.759(In.) |
| 2 | 24 | 1.350(In.) |
| 100 | 6 | 1.880(In.) |
| 100 | 24 | 3.920(In.) |

Latitude in degrees = 34.92
COAST RANGES area of study
Y2 = 0.344, Y100 = 0.974 or Y100 = 0.973
Slope used for rainfall intensity curve b = 0.5500

Remaining year storm values:

| 1 Hour Rainfall - | Year Storm |
|---|---|
| 0.344 | 2 |
| 0.499 | 5 |
| 0.603 | 10 |
| 0.737 | 25 |
| 0.859 | 50 |
| 0.974 | 100 |

| 24 Hour Rainfall - | Year Storm |
|---|---|
| 1.350 | 2 |
| 1.985 | 5 |
| 2.405 | 10 |
| 2.953 | 25 |
| 3.451 | 50 |
| 3.920 | 100 |

Note: Computer estimated pipe sizes use 25 year storm flow rates

NOTE: ENGLISH (IN-LB) INPUT DATA UNITS USED
NOTE: ENGLISH (IN-LB) OUTPUT DATA UNITS USED

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point 100.000 to Point 102.000
**** INITIAL AREA EVALUATION ****
_____
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) = 0.223
Initial subarea data:
Initial area flow distance = 425.000(Ft.)
Top (of initial area) elevation = 3042.000(Ft.)
Bottom (of initial area) elevation = 2872.000(Ft.)
Difference in elevation = 170.000(Ft.)
Slope = 0.40000 s(%)= 40.00
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 7.097 min.
Rainfall intensity = 3.151(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 0.500(CFS)
Subarea runoff = 1.773(CFS)
Total initial stream area = 0.790(Ac.)
---

******* DATA FOR OTHER YEAR STORMS *******

| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
|---|---|---|---|---|---|---|---|---|
| 5 | 0.8 | 7.10 | 1.62 | 0.66 | 0.05 | 0.1 | 0.7 | 0.7 |
| 10 | 0.8 | 7.10 | 1.95 | 0.66 | 0.09 | 0.1 | 0.9 | 0.9 |
| 25 | 0.8 | 7.10 | 2.38 | 0.66 | 0.14 | 0.2 | 1.2 | 1.2 |
| 50 | 0.8 | 7.10 | 2.78 | 0.66 | 0.18 | 0.4 | 1.5 | 1.5 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point 102.000 to Point 104.000
**** IMPROVED CHANNEL TRAVEL TIME ****
_____
Upstream point elevation = 2872.00(Ft.)
Downstream point elevation = 2766.00(Ft.)
Channel length thru subarea = 837.00(Ft.)
Channel Slope = 0.1266 Ft/Ft
Channel base width = 20.000(Ft.)
Slope or 'Z' of left channel bank = 2.000
Slope or 'Z' of right channel bank = 2.000
Estimated mean flow rate at midpoint of channel = 30.574(CFS)
Manning's 'N' = 0.030

```
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =     30.574(CFS)
Depth of flow =   0.230(Ft.), Average velocity =   6.497(Ft/s)
Channel flow top width =   20.920(Ft.)
Flow Velocity =    6.50(Ft/s)
Travel time  =    2.15 min.
Time of concentration =    9.24 min.
Critical depth =      0.414(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =  14.477(CFS)
Rainfall intensity =      2.725(In/Hr) for a 100 year storm
Subarea runoff =     47.450(CFS) for   25.670(Ac.)
Total runoff =     49.223(CFS)   Total area =       26.46(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5   26.5   11.09     1.26      0.66   0.05     1.5  14.4  14.4
  10   26.5   10.54     1.57      0.66   0.09     3.3  21.7  21.7
  25   26.5    9.89     1.99      0.66   0.14     6.6  31.6  31.6
  50   26.5    9.52     2.36      0.66   0.18    10.4  40.6  40.6
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.110(Ft.), Average velocity =   4.018(Ft/s)
** 10 year storm **
Depth of flow =   0.141(Ft.), Average velocity =   4.716(Ft/s)
** 25 year storm **
Depth of flow =   0.176(Ft.), Average velocity =   5.468(Ft/s)
** 50 year storm **
Depth of flow =   0.205(Ft.), Average velocity =   6.030(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      200.000 to Point      202.000
**** INITIAL AREA EVALUATION ****

________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   515.000(Ft.)
Top (of initial area) elevation =  2901.000(Ft.)
Bottom (of initial area) elevation =  2802.800(Ft.)
Difference in elevation =    98.200(Ft.)
Slope =    0.19068  s(%)=      19.07
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.888 min.
Rainfall intensity =      2.785(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   0.788(CFS)
Subarea runoff =      2.699(CFS)
Total initial stream area =        1.410(Ac.)
```

| | | ******* DATA FOR OTHER YEAR STORMS ******* | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
| 5 | 1.4 | 8.89 | 1.43 | 0.66 | 0.05 | 0.1 | 1.0 | 1.0 |
| 10 | 1.4 | 8.89 | 1.72 | 0.66 | 0.09 | 0.2 | 1.4 | 1.4 |
| 25 | 1.4 | 8.89 | 2.11 | 0.66 | 0.14 | 0.4 | 1.8 | 1.8 |
| 50 | 1.4 | 8.89 | 2.46 | 0.66 | 0.18 | 0.6 | 2.3 | 2.3 |

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      202.000 to Point      204.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2802.80(Ft.)
Downstream point elevation =   2695.00(Ft.)
Channel length thru subarea  =   1232.00(Ft.)
Channel Slope = 0.0875 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =      6.832(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      6.832(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.105(Ft.), Average velocity =   3.228(Ft/s)
Channel flow top width =   20.419(Ft.)
Flow Velocity =    3.23(Ft/s)
Travel time  =    6.36 min.
Time of concentration =   15.25 min.
Critical depth =      0.152(Ft.)
 Adding area flow to channel
```

```
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   2.381(CFS)
Rainfall intensity =      2.069(In/Hr) for a 100 year storm
Subarea runoff =      4.579(CFS) for    4.320(Ac.)
Total runoff =      7.278(CFS)   Total area =        5.73(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    5.7   18.30     0.96      0.66   0.05     0.2   1.6   1.6
  10    5.7   17.38     1.19      0.66   0.09     0.5   2.7   2.7
  25    5.7   16.32     1.51      0.66   0.14     1.1   4.4   4.4
  50    5.7   15.71     1.80      0.66   0.18     1.7   5.9   5.9
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.042(Ft.), Average velocity =   1.751(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.058(Ft.), Average velocity =   2.195(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.077(Ft.), Average velocity =   2.642(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.092(Ft.), Average velocity =   2.964(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      204.000 to Point      206.000
**** IMPROVED CHANNEL TRAVEL TIME ****
__________________________________________________________________
Upstream point elevation =   2695.00(Ft.)
Downstream point elevation =   2475.00(Ft.)
Channel length thru subarea  =   2820.00(Ft.)
Channel Slope = 0.0780 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =     29.371(CFS)
```

```
Manning's 'N'    = 0.030
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =     29.371(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.260(Ft.), Average velocity =   5.515(Ft/s)
Channel flow top width =   21.038(Ft.)
Flow Velocity =    5.52(Ft/s)
Travel time  =    8.52 min.
Time of concentration =   23.77 min.
Critical depth =      0.398(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =  13.188(CFS)
Rainfall intensity =      1.621(In/Hr) for a 100 year storm
Subarea runoff =     27.839(CFS) for   34.790(Ac.)
Total runoff =     35.117(CFS)   Total area =       40.52(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5   40.5   28.53     0.75      0.66   0.05     1.4   3.4   3.4
  10   40.5   27.10     0.93      0.66   0.09     3.0  10.0  10.0
  25   40.5   25.44     1.18      0.66   0.14     6.0  19.1  19.1
  50   40.5   24.48     1.41      0.66   0.18     9.5  27.3  27.3
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.064(Ft.), Average velocity =   2.209(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.123(Ft.), Average velocity =   3.380(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 10 minutes.
Depth of flow =   0.180(Ft.), Average velocity =   4.350(Ft/s)
** 50 year storm **
Depth of flow =   0.223(Ft.), Average velocity =   5.001(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      208.000 to Point      206.000
```

**** SUBAREA FLOW ADDITION ****

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UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) = 0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) = 0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) = 13.709(CFS)
Time of concentration = 23.77 min.
Rainfall intensity = 1.621(In/Hr) for a 100 year storm
Subarea runoff = 1.387(CFS) for 1.600(Ac.)
Total runoff = 36.503(CFS) Total area = 42.12(Ac.)

---

******* DATA FOR OTHER YEAR STORMS *******

| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
|---|---|---|---|---|---|---|---|---|
| 5 | 42.1 | 28.53 | 0.75 | 0.66 | 0.05 | 1.4 | 3.6 | 3.6 |
| 10 | 42.1 | 27.10 | 0.93 | 0.66 | 0.09 | 3.1 | 10.4 | 10.4 |
| 25 | 42.1 | 25.44 | 1.18 | 0.66 | 0.14 | 6.3 | 19.8 | 19.8 |
| 50 | 42.1 | 24.48 | 1.41 | 0.66 | 0.18 | 9.8 | 28.4 | 28.4 |

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point 300.000 to Point 302.000
**** INITIAL AREA EVALUATION ****

---

UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) = 0.223
Initial subarea data:
Initial area flow distance = 702.000(Ft.)
Top (of initial area) elevation = 3039.000(Ft.)
Bottom (of initial area) elevation = 2802.000(Ft.)
Difference in elevation = 237.000(Ft.)
Slope = 0.33761 s(%)= 33.76
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.975 min.
Rainfall intensity = 2.770(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) = 1.535(CFS)
Subarea runoff = 5.246(CFS)
Total initial stream area = 2.760(Ac.)

```
------------------------------------------------------------------
              *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.8    8.97     1.42      0.66   0.05     0.2   1.9   1.9
  10    2.8    8.97     1.71      0.66   0.09     0.4   2.6   2.6
  25    2.8    8.97     2.09      0.66   0.14     0.7   3.6   3.6
  50    2.8    8.97     2.44      0.66   0.18     1.1   4.4   4.4
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      302.000 to Point      304.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2802.00(Ft.)
Downstream point elevation =   2668.00(Ft.)
Channel length thru subarea  =   1811.00(Ft.)
Channel Slope = 0.0740 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =     20.488(CFS)
Manning's 'N'    = 0.030
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =     20.488(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.213(Ft.), Average velocity =   4.719(Ft/s)
Channel flow top width =   20.850(Ft.)
Flow Velocity =    4.72(Ft/s)
Travel time  =    6.40 min.
Time of concentration =   15.37 min.
Critical depth =      0.316(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   7.777(CFS)
Rainfall intensity =      2.060(In/Hr) for a 100 year storm
Subarea runoff =     18.480(CFS) for   16.040(Ac.)
Total runoff =     23.725(CFS)   Total area =       18.80(Ac.)
------------------------------------------------------------------
              *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
```

```
   5   18.8   18.45     0.96      0.66   0.05     0.8   5.0   5.0
  10   18.8   17.52     1.19      0.66   0.09     1.8   8.9   8.9
  25   18.8   16.45     1.50      0.66   0.14     3.6  14.3  14.3
  50   18.8   15.83     1.79      0.66   0.18     5.6  19.1  19.1
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.084(Ft.), Average velocity =   2.566(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.118(Ft.), Average velocity =   3.218(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.157(Ft.), Average velocity =   3.869(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.187(Ft.), Average velocity =   4.337(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      400.000 to Point      402.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   806.000(Ft.)
Top (of initial area) elevation =  2800.000(Ft.)
Bottom (of initial area) elevation =  2795.870(Ft.)
Difference in elevation =     4.130(Ft.)
Slope =    0.00512  s(%)=       0.51
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   21.916 min.
Rainfall intensity =      1.695(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   0.572(CFS)
Subarea runoff =      1.568(CFS)
Total initial stream area =        1.680(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    1.7   21.92     0.87      0.66   0.05     0.1   0.3   0.3
  10    1.7   21.92     1.05      0.66   0.09     0.1   0.6   0.6
```

```
  25    1.7   21.92     1.28      0.66   0.14     0.3   0.9   0.9
  50    1.7   21.92     1.49      0.66   0.18     0.4   1.3   1.3
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      402.000 to Point      404.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2795.87(Ft.)
Downstream point elevation =   2680.00(Ft.)
Channel length thru subarea  =   1023.00(Ft.)
Channel Slope = 0.1133 Ft/Ft
Channel base width    =    2.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =      4.830(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      4.830(CFS)
Depth of flow =   0.200(Ft.), Average velocity =  10.063(Ft/s)
Channel flow top width =    2.800(Ft.)
Flow Velocity =   10.06(Ft/s)
Travel time  =    1.69 min.
Time of concentration =   23.61 min.
Critical depth =      0.477(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   2.832(CFS)
Rainfall intensity =      1.627(In/Hr) for a 100 year storm
Subarea runoff =      5.993(CFS) for    6.990(Ac.)
Total runoff =      7.561(CFS)   Total area =        8.67(Ac.)
----------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    8.7   28.33     0.75      0.66   0.05     0.3   0.8   0.8
  10    8.7   26.92     0.94      0.66   0.09     0.6   2.2   2.2
  25    8.7   25.26     1.19      0.66   0.14     1.3   4.1   4.1
  50    8.7   24.32     1.41      0.66   0.18     2.0   5.9   5.9
----------------------------------------------------------------
----------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
```

```
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.052(Ft.), Average velocity =   4.440(Ft/s)
** 10 year storm **
Depth of flow =   0.097(Ft.), Average velocity =   6.551(Ft/s)
** 25 year storm **
Depth of flow =   0.141(Ft.), Average velocity =   8.201(Ft/s)
** 50 year storm **
Depth of flow =   0.173(Ft.), Average velocity =   9.257(Ft/s)
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      500.000 to Point      502.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   608.000(Ft.)
Top (of initial area) elevation =  2725.000(Ft.)
Bottom (of initial area) elevation =  2628.000(Ft.)
Difference in elevation =    97.000(Ft.)
Slope =    0.15954  s(%)=      15.95
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.843 min.
Rainfall intensity =      2.633(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.845(CFS)
Subarea runoff =      6.202(CFS)
Total initial stream area =        3.490(Ac.)
----------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    3.5    9.84     1.35      0.66   0.05     0.2   2.2   2.2
  10    3.5    9.84     1.63      0.66   0.09     0.5   3.0   3.0
  25    3.5    9.84     1.99      0.66   0.14     0.9   4.2   4.2
  50    3.5    9.84     2.32      0.66   0.18     1.3   5.2   5.2
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      600.000 to Point      602.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
```

```
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   362.000(Ft.)
Top (of initial area) elevation =  2694.500(Ft.)
Bottom (of initial area) elevation =  2672.000(Ft.)
Difference in elevation =    22.500(Ft.)
Slope =    0.06215  s(%)=       6.22
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.659 min.
Rainfall intensity =      2.660(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.426(CFS)
Subarea runoff =      4.811(CFS)
Total initial stream area =        2.670(Ac.)
```

| | | ******* DATA FOR OTHER YEAR STORMS ******* | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | Area (Ac) | TC (Min) | Intensity (In/Hr) | Fm Avg (In/Hr) | Y Avg (In/Hr) | Qmin (cfs) | Qcalc (cfs) | Qtot (cfs) |
| 5 | 2.7 | 9.66 | 1.36 | 0.66 | 0.05 | 0.2 | 1.7 | 1.7 |
| 10 | 2.7 | 9.66 | 1.65 | 0.66 | 0.09 | 0.4 | 2.4 | 2.4 |
| 25 | 2.7 | 9.66 | 2.01 | 0.66 | 0.14 | 0.7 | 3.3 | 3.3 |
| 50 | 2.7 | 9.66 | 2.35 | 0.66 | 0.18 | 1.0 | 4.1 | 4.1 |

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      700.000 to Point      702.000
**** INITIAL AREA EVALUATION ****

____________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   476.000(Ft.)
Top (of initial area) elevation =  2850.000(Ft.)
Bottom (of initial area) elevation =  2765.000(Ft.)
Difference in elevation =    85.000(Ft.)
Slope =    0.17857  s(%)=      17.86
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.726 min.
Rainfall intensity =      2.813(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.135(CFS)
```

```
Subarea runoff =      3.898(CFS)
Total initial stream area =        2.010(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.0    8.73     1.44      0.66   0.05     0.1   1.4   1.4
  10    2.0    8.73     1.74      0.66   0.09     0.3   2.0   2.0
  25    2.0    8.73     2.13      0.66   0.14     0.5   2.7   2.7
  50    2.0    8.73     2.48      0.66   0.18     0.8   3.3   3.3
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      702.000 to Point      704.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2765.00(Ft.)
Downstream point elevation =   2701.00(Ft.)
Channel length thru subarea  =    762.00(Ft.)
Channel Slope = 0.0840 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   5.000
Slope or 'Z' of right channel bank =   5.000
Estimated mean flow rate at midpoint of channel =     27.693(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =     27.693(CFS)
Depth of flow =   0.288(Ft.), Average velocity =   4.487(Ft/s)
Channel flow top width =   22.879(Ft.)
Flow Velocity =    4.49(Ft/s)
Travel time  =    2.83 min.
Time of concentration =   11.56 min.
Critical depth =      0.379(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =  12.848(CFS)
Rainfall intensity =      2.410(In/Hr) for a 100 year storm
Subarea runoff =     37.969(CFS) for   24.540(Ac.)
Total runoff =     41.867(CFS)   Total area =       26.55(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
```

```
        (Ac)     (Min)   (In/Hr)    (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    26.5    13.87     1.12       0.66    0.05     1.3  11.0  11.0
  10    26.5    13.17     1.39       0.66    0.09     2.9  17.4  17.4
  25    26.5    12.37     1.76       0.66    0.14     5.9  26.2  26.2
  50    26.5    11.90     2.09       0.66    0.18     9.2  34.2  34.2
------------------------------------------------------------------
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.130(Ft.), Average velocity =   2.705(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.171(Ft.), Average velocity =   3.228(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.218(Ft.), Average velocity =   3.770(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.256(Ft.), Average velocity =   4.165(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      710.000 to Point      712.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   319.000(Ft.)
Top (of initial area) elevation =  2720.000(Ft.)
Bottom (of initial area) elevation =  2679.000(Ft.)
Difference in elevation =    41.000(Ft.)
Slope =    0.12853  s(%)=      12.85
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.941 min.
Rainfall intensity =      2.963(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   0.137(CFS)
Subarea runoff =      0.477(CFS)
Total initial stream area =        0.230(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    0.2    7.94     1.52       0.66    0.05     0.0   0.2   0.2
```

```
  10    0.2    7.94     1.83      0.66   0.09     0.0   0.2   0.2
  25    0.2    7.94     2.24      0.66   0.14     0.1   0.3   0.3
  50    0.2    7.94     2.61      0.66   0.18     0.1   0.4   0.4
----------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      712.000 to Point      714.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2679.00(Ft.)
Downstream point elevation =   2635.00(Ft.)
Channel length thru subarea  =    727.00(Ft.)
Channel Slope = 0.0605 Ft/Ft
Channel base width    =   20.000(Ft.)
Slope or 'Z' of left channel bank =   2.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =      1.348(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      1.348(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.053(Ft.), Average velocity =   1.276(Ft/s)
Channel flow top width =   20.210(Ft.)
Flow Velocity =    1.28(Ft/s)
Travel time  =    9.49 min.
Time of concentration =   17.43 min.
Critical depth =      0.052(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   0.413(CFS)
Rainfall intensity =      1.922(In/Hr) for a 100 year storm
Subarea runoff =      0.741(CFS) for    0.840(Ac.)
Total runoff =      1.218(CFS)   Total area =        1.07(Ac.)
----------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area     TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)     (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    1.1   20.92     0.89      0.66   0.05     0.0   0.2   0.2
  10    1.1   19.87     1.11      0.66   0.09     0.1   0.4   0.4
  25    1.1   18.65     1.40      0.66   0.14     0.2   0.7   0.7
  50    1.1   17.96     1.67      0.66   0.18     0.3   1.0   1.0
----------------------------------------------------------------
```

```
------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.019(Ft.), Average velocity =   0.651(Ft/s)
** 10 year storm **
WARNING: Travel time greater than 5 min. with TC less than 60 min.
Depth of flow =   0.028(Ft.), Average velocity =   0.845(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 10 minutes.
Depth of flow =   0.038(Ft.), Average velocity =   1.033(Ft/s)
** 50 year storm **
WARNING: Travel time greater than 10 minutes.
Depth of flow =   0.046(Ft.), Average velocity =   1.167(Ft/s)
------------------------------------------------------------------


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      720.000 to Point      722.000
**** INITIAL AREA EVALUATION ****
__________________________________________________________________
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Initial subarea data:
Initial area flow distance =   490.000(Ft.)
Top (of initial area) elevation =  2756.000(Ft.)
Bottom (of initial area) elevation =  2703.000(Ft.)
Difference in elevation =    53.000(Ft.)
Slope =    0.10816  s(%)=      10.82
TC = k(0.525)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.759 min.
Rainfall intensity =      2.645(In/Hr) for a 100 year storm
Minimum Q (Qmin=0.9YIA) =   1.349(CFS)
Subarea runoff =      4.542(CFS)
Total initial stream area =        2.540(Ac.)
------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    2.5    9.76     1.36      0.66   0.05     0.2   1.6   1.6
  10    2.5    9.76     1.64      0.66   0.09     0.3   2.2   2.2
  25    2.5    9.76     2.00      0.66   0.14     0.6   3.1   3.1
  50    2.5    9.76     2.33      0.66   0.18     1.0   3.8   3.8
------------------------------------------------------------------
```

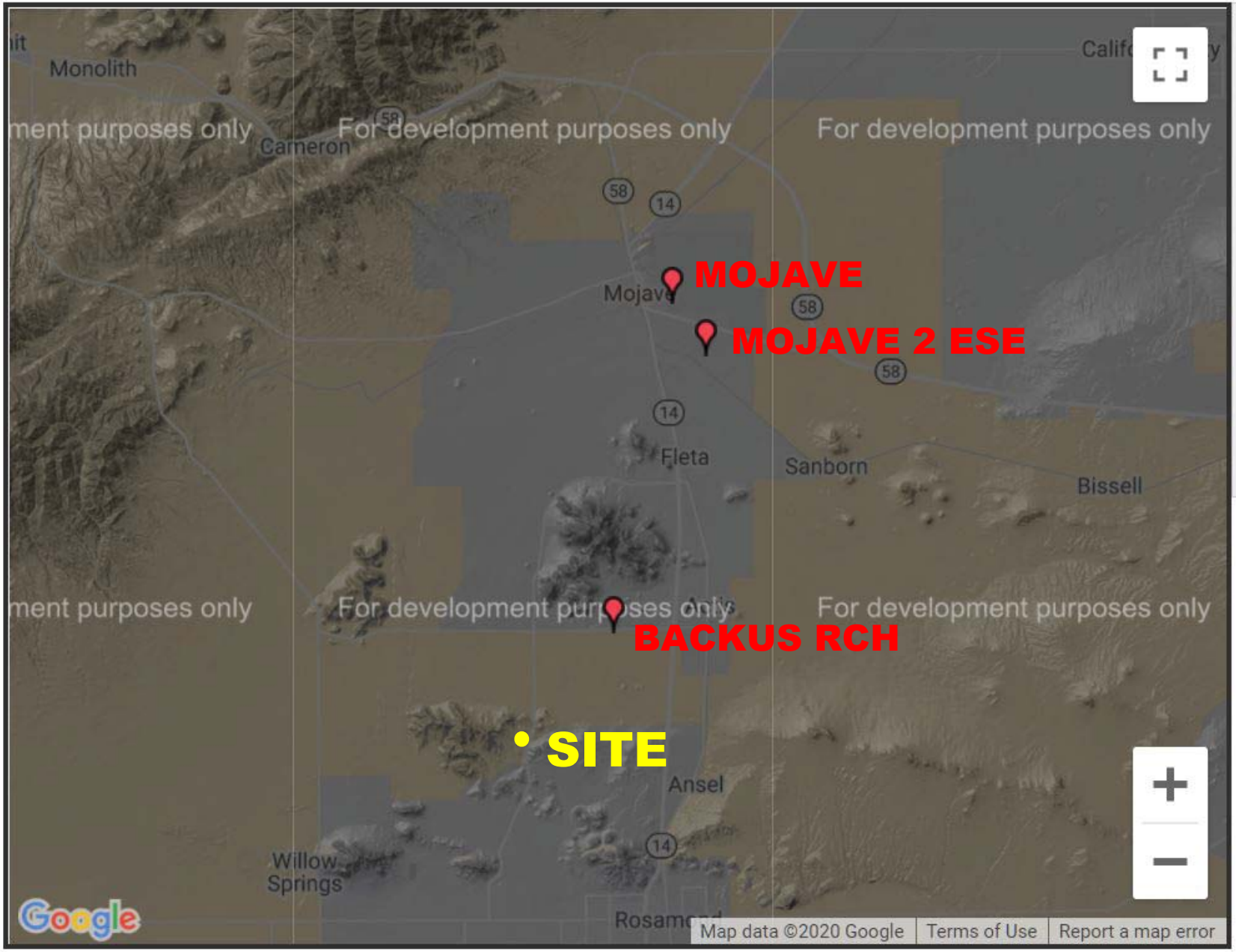
```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point      722.000 to Point      724.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =   2703.00(Ft.)
Downstream point elevation =   2676.00(Ft.)
Channel length thru subarea  =    723.00(Ft.)
Channel Slope = 0.0373 Ft/Ft
Channel base width    =    1.000(Ft.)
Slope or 'Z' of left channel bank =  10.000
Slope or 'Z' of right channel bank =   2.000
Estimated mean flow rate at midpoint of channel =      8.324(CFS)
Manning's 'N'    = 0.040
Maximum depth of channel  =    2.000(Ft.)
Flow(q) thru subarea =      8.324(CFS)
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.569(Ft.), Average velocity =   3.318(Ft/s)
Channel flow top width =    7.824(Ft.)
Flow Velocity =    3.32(Ft/s)
Travel time  =    3.63 min.
Time of concentration =   13.39 min.
Critical depth =      0.578(Ft.)
 Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil AMC II  = 63.00
Pervious (Ap) = 1.000 Loss rate, Fm = 0.658(In/Hr), Fp = 0.658(In/Hr)
Subarea (Ai) = 0.0000; Subarea Yield Fraction(Y) =     0.223
Area Averaged (Ai) = 0.0000; Average Yield Fraction(Y) =     0.223
Area averaged Fm = 0.658(In/Hr), Area Averaged Fp = 0.658(In/Hr)
Minimum Q (Qmin=0.9YIA) =   3.021(CFS)
Rainfall intensity =      2.223(In/Hr) for a 100 year storm
Subarea runoff =      4.990(CFS) for    4.230(Ac.)
Total runoff =      9.533(CFS)   Total area =        6.77(Ac.)
------------------------------------------------------------------------
               *******  DATA FOR OTHER YEAR STORMS *******
  Year  Area    TC    Intensity  Fm Avg  Y Avg   Qmin  Qcalc Qtot
        (Ac)    (Min)  (In/Hr)   (In/Hr) (In/Hr) (cfs) (cfs) (cfs)
   5    6.8   16.07     1.03      0.66   0.05     0.3   2.3   2.3
  10    6.8   15.27     1.28      0.66   0.09     0.7   3.8   3.8
  25    6.8   14.33     1.62      0.66   0.14     1.4   5.9   5.9
  50    6.8   13.79     1.93      0.66   0.18     2.2   7.7   7.7
------------------------------------------------------------------------
------------------------------------------------------------------------
       ******  OTHER STORM YEAR DEPTHS AT END OF CHANNEL  ******
** 5 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.305(Ft.), Average velocity =   2.302(Ft/s)
** 10 year storm **
```

```
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.382(Ft.), Average velocity =   2.624(Ft/s)
** 25 year storm **
WARNING: Travel time greater than 3 min. with TC less than 30 min.
Depth of flow =   0.462(Ft.), Average velocity =   2.933(Ft/s)
** 50 year storm **
Depth of flow =   0.521(Ft.), Average velocity =   3.148(Ft/s)
----------------------------------------------------------------
End of computations, total study area =         136.600 (Ac.)
```

# APPENDIX B

## RETENTION DATA

# US COOP Station Map



# MOJAVE, CALIFORNIA (045756)

## Period of Record Monthly Climate Summary

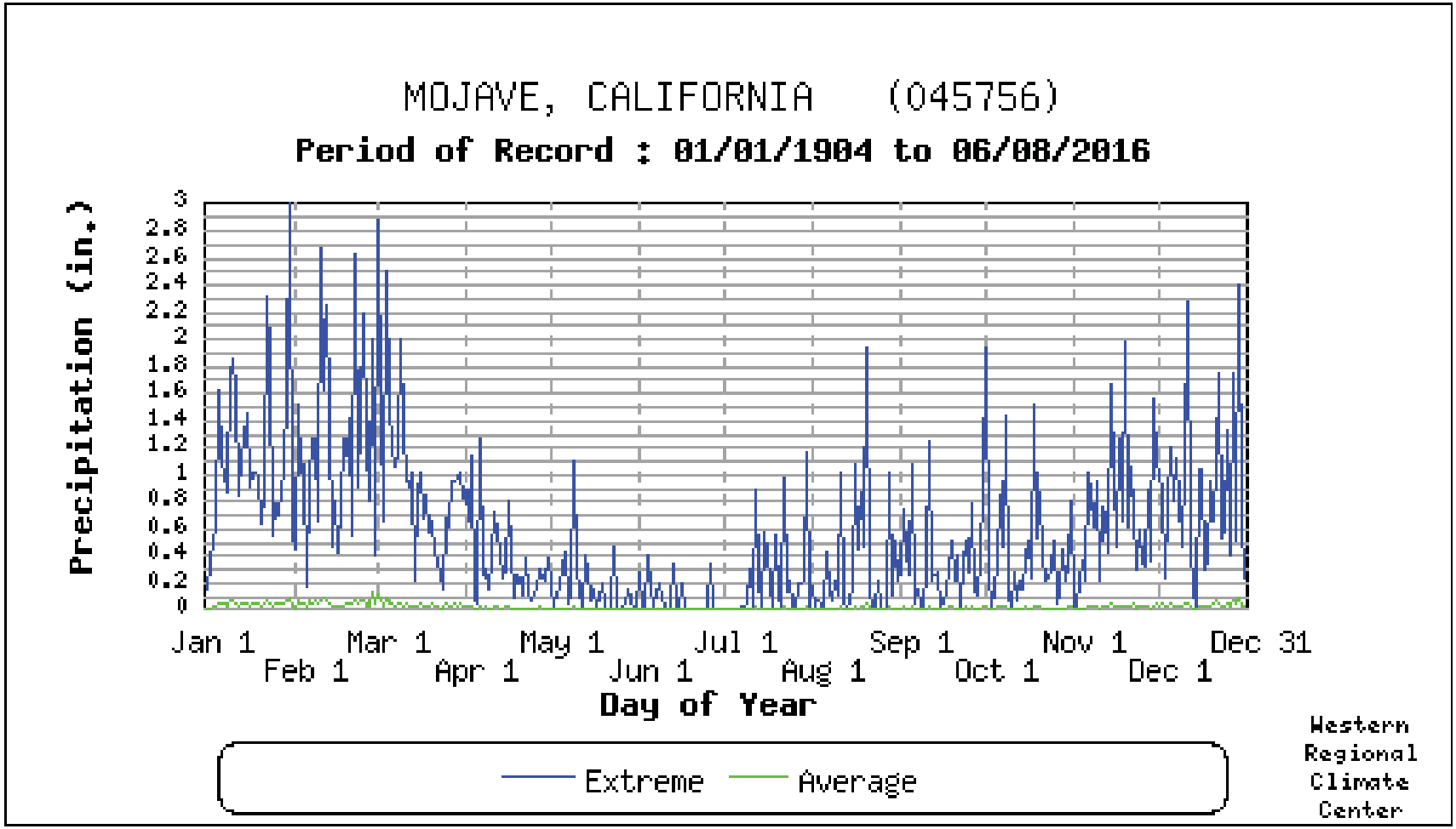
**Period of Record : 01/01/1904 to 06/08/2016**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 57.8 | 61.2 | 64.7 | 71.3 | 79.9 | 89.9 | 97.6 | 96.4 | 89.0 | 78.5 | 65.7 | 57.2 | 75.8 |
| Average Min. Temperature (F) | 34.2 | 37.1 | 41.0 | 46.3 | 55.1 | 63.8 | 69.7 | 68.0 | 60.3 | 50.3 | 40.2 | 32.9 | 49.9 |
| Average Total Precipitation (in.) | 1.20 | 1.27 | 0.93 | 0.30 | 0.09 | 0.03 | 0.11 | 0.15 | 0.21 | 0.24 | 0.53 | 0.87 | 5.93 |
| Average Total SnowFall (in.) | 0.8 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 1.7 |
| Average Snow Depth (in.) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Percent of possible observations for period of record.
Max. Temp.: 65.4% Min. Temp.: 65.2% Precipitation: 97.3% Snowfall: 97.1% Snow Depth: 96.5%
Check Station Metadata or Metadata graphics for more detail about data completeness.

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*Western Regional Climate Center, wrcc@dri.edu*


MOJAVE, CALIFORNIA (045756)
Period of Record : 01/01/1904 to 06/08/2016
Precipitation (in.)
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Nov 1
Dec 1
Dec 31
Day of Year
Extreme
Average
Western Regional Climate Center

# MOJAVE, CALIFORNIA

## Period of Record General Climate Summary - Precipitation

| Station:(045756) MOJAVE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From Year=1904 To Year=2012 | | | | | | | | | | | | | | |
| | Precipitation | | | | | | | | | | | Total Snowfall | | |
| | Mean | High | Year | Low | Year | 1 Day Max. | | >= 0.01 in. | >= 0.10 in. | >= 0.50 in. | >= 1.00 in. | Mean | High | Year |
| | in. | in. | - | in. | - | in. | dd/yyyy or yyyymmdd | # Days | # Days | # Days | # Days | in. | in. | - |
| January | 1.20 | 6.46 | 1995 | 0.00 | 1910 | 3.00 | 30/1915 | 4 | 2 | 1 | 0 | 0.8 | 9.5 | 1979 |
| February | 1.27 | 6.85 | 1998 | 0.00 | 1910 | 2.67 | 10/1978 | 4 | 2 | 1 | 0 | 0.4 | 11.0 | 1911 |
| March | 0.93 | 5.00 | 1912 | 0.00 | 1909 | 2.88 | 01/1983 | 3 | 2 | 1 | 0 | 0.2 | 3.5 | 1954 |
| April | 0.30 | 2.08 | 1965 | 0.00 | 1904 | 1.25 | 06/1906 | 2 | 1 | 0 | 0 | 0.0 | 0.5 | 1963 |
| May | 0.09 | 1.28 | 1977 | 0.00 | 1904 | 1.10 | 09/1977 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1949 |
| June | 0.03 | 0.41 | 1963 | 0.00 | 1904 | 0.40 | 04/1984 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1949 |
| July | 0.11 | 2.43 | 1984 | 0.00 | 1904 | 1.16 | 30/1984 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1948 |
| August | 0.15 | 2.02 | 1983 | 0.00 | 1905 | 1.94 | 20/1995 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1948 |
| September | 0.21 | 2.94 | 1976 | 0.00 | 1905 | 1.23 | 11/1976 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1906 |
| October | 0.24 | 2.47 | 2004 | 0.00 | 1904 | 1.92 | 01/1981 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1948 |
| November | 0.53 | 3.78 | 1967 | 0.00 | 1904 | 1.98 | 19/1967 | 2 | 1 | 0 | 0 | 0.1 | 6.5 | 1906 |
| December | 0.87 | 5.33 | 1943 | 0.00 | 1911 | 2.40 | 29/1965 | 3 | 2 | 1 | 0 | 0.2 | 7.0 | 2008 |
| Annual | 5.93 | 15.51 | 1983 | 0.85 | 1942 | 3.00 | 19150130 | 22 | 13 | 4 | 1 | 1.7 | 11.0 | 1962 |
| Winter | 3.33 | 11.68 | 1944 | 0.00 | 1912 | 3.00 | 19150130 | 11 | 7 | 2 | 1 | 1.4 | 11.0 | 1962 |
| Spring | 1.31 | 6.00 | 1912 | 0.00 | 1909 | 2.88 | 19830301 | 6 | 3 | 1 | 0 | 0.2 | 3.5 | 1954 |
| Summer | 0.29 | 3.12 | 1984 | 0.00 | 1907 | 1.94 | 19950820 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1949 |
| Fall | 0.99 | 4.45 | 1967 | 0.00 | 1995 | 1.98 | 19671119 | 4 | 2 | 1 | 0 | 0.1 | 1.0 | 1952 |

Table updated on Oct 31, 2012
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons
Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

# MOJAVE, CA

## Maximum of Precipitation (Inches)

### (045756)

File last updated on September 17, 2020
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual Months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

| YEAR(S) | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1904 | -----z | 0.41 | 0.04y | 0.00 | 0.00 | 0.00 | 0.00 | -----z | -----z | 0.00 | 0.00 | -----z | -----z |
| 1905 | -----z | -----z | 1.00 | 0.00 | 0.00 | -----z | 0.00 | 0.00 | 0.00 | 0.00 | -----z | -----z | -----z |
| 1906 | 0.50 | 0.50 | -----z | 1.25 | 0.00 | -----z | 0.00 | -----z | -----z | 0.00 | 0.35 | 1.75 | -----z |
| 1907 | 1.75 | 0.50 | 2.50 | -----z | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -----z | -----z | -----z | -----z |
| 1908 | -----z | -----z | -----z | -----z | 0.00 | -----z | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.62 | -----z |
| 1909 | 0.62 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | -----z | 0.06 | -----z | -----z | 0.50 | 1.00 | -----z |
| 1910 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -----z | 0.00 | 0.00 | -----z | 0.20 | 0.00 | 0.10 | -----z |
| 1911 | 1.60 | 1.50 | 0.50b | 0.00a | 0.00 | 0.00 | 0.00 | 0.00 | 0.00a | 0.00 | 0.00 | 0.00 | 1.60d |
| 1912 | 0.00 | 0.00 | 2.00a | 0.00a | 0.00a | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 2.00c |
| 1913 | 0.25 | 0.20 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1914 | -----z | -----z | -----z | -----z | -----z | -----z | 0.00 | -----z | 0.00 | -----z | 0.00 | 1.00 | -----z |
| 1915 | 3.00a | 0.62 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1916 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1917 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1918 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1919 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1920 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1921 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1922 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1923 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1924 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1925 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1926 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1927 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1928 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1929 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1930 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1931 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1932 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1933 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1934 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1935 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1936 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1937 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1938 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1939 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| 1940 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | 0.00 | 0.53 | -----z |
| 1941 | 0.32 | 0.75 | 1.46t | 0.72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.14 | 0.91 | 1.46t |
| 1942 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.23 | 0.45 |
| 1943 | 2.31 | 0.71 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 | 0.16 | 0.14 | 2.26 | 2.31 |
| 1944 | 0.54 | 2.62 | 1.32 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.66 | 0.19 | 2.62 |
| 1945 | 0.28 | 1.39 | 1.63 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.83 | 0.00 | 1.74 | 1.74 |
| 1946 | 0.04 | 0.57 | 0.76 | 0.12 | 0.02 | 0.00 | 0.54 | 0.00 | 0.00 | 0.07 | -----z | -----z | -----z |
| 1947 | 0.31 | 0.31 | 0.08 | 0.10 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.17 | -----z | 0.76 | -----z |
| 1948 | 0.00 | 0.41 | 0.40 | 0.22 | 0.00 | 0.28 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.63 | 0.63 |
| 1949 | 0.35 | 0.18 | 0.06d | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.20 | 0.43 | 0.43d |
| 1950 | 0.31 | 0.23 | 0.19 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.10 | 0.00 | 0.31 |
| 1951 | -----z | 0.13 | 0.11 | 0.38 | 0.28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.22 | 0.51 | -----z |
| 1952 | 0.94a | 0.00 | 1.20 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00a | 0.97a | 0.77 | 1.20c |
| 1953 | 0.23 | 0.02 | 0.15 | 0.23 | 0.14 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.26 | 0.12 | 0.26 |
| 1954 | 0.96 | 0.40 | 0.41 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.65 | 0.23 | 0.96 |
| 1955 | 0.57 | 0.17 | 0.00 | 0.07 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.31 | 0.57 |
| 1956 | 0.70 | 0.01a | 0.00 | 0.56 | 0.29 | 0.00 | 0.20 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.70a |
| 1957 | 1.09 | 0.50 | 0.21 | 0.18 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.16 | 0.21 | 1.03 | 1.09 |
| 1958 | 0.52 | 0.94 | 0.45 | 0.65 | 0.05 | 0.00 | 0.00a | 0.01 | 0.33 | 0.12 | 0.07 | 0.00 | 0.94a |
| 1959 | 1.10 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 | 0.49 | 1.10 |
| 1960 | 0.34 | 0.39 | 0.02 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.41 | 0.00 | 0.41 |
| 1961 | 0.24 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 0.00 | 0.00 | 0.34 | 0.85 | 0.85 |
| 1962 | 0.29 | 0.96 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.96 |
| 1963 | 0.07 | 0.70 | 0.48 | 0.15 | 0.00 | 0.33 | 0.00 | 0.21 | 0.83 | 0.53 | 0.60 | 0.03 | 0.83 |
| 1964 | 0.32 | 0.02 | 0.15 | 0.11 | 0.16 | 0.00 | 0.06 | 0.00 | 0.00 | 0.19 | 0.21 | 0.05 | 0.32 |
| 1965 | 0.00 | 0.00 | 0.94 | 1.13 | 0.00 | 0.01 | 0.17 | 0.22 | 0.00 | 0.00e | 1.26 | 2.40 | 2.40e |
| 1966 | 0.55 | 0.23 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.05 | 0.84 | 0.80 | 0.84 |
| 1967 | 0.95 | 0.00 | 0.42 | 0.29 | 0.00 | 0.00 | 0.01 | 0.00 | 0.26 | 0.00 | 1.98 | 0.36 | 1.98 |
| 1968 | 0.19 | 0.21 | 0.31 | 0.22 | -----z | 0.00 | 0.18 | 0.00 | 0.00 | 0.08 | 0.43 | 0.16 | -----z |
| 1969 | 0.85 | 2.18 | 0.07 | 0.44 | 0.01 | 0.18 | 0.18 | 0.00 | 0.00 | 0.00 | 0.46 | 0.00 | 2.18 |
| 1970 | 0.22 | -----z | 1.04 | 0.06 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 1.55 | 0.63 | -----z |
| 1971 | 0.04 | 0.10 | 0.00 | 0.08 | 0.12 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.01 | 0.56 | 0.56 |
| 1972 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.19 | 0.00 | 0.06 | 0.04 | 0.00 | 0.33 | 0.15 | 0.33 |
| 1973 | 0.36 | 1.61 | 0.47 | 0.04 | 0.14 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.42 | 0.44 | 1.61 |
| 1974 | 0.87 | 0.05 | 0.23 | 0.31 | 0.18 | 0.00 | 0.13 | 0.03 | 0.00 | 1.43 | 0.00 | 0.76 | 1.43 |
| 1975 | 0.02 | 0.25 | 0.32 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.07 | 0.38 |
| 1976 | 0.00 | 0.65 | 0.00 | 0.07 | 0.04 | 0.00 | 0.13 | 0.00 | 1.23 | 0.05 | -----z | 0.24 | -----z |
| 1977 | 0.83 | 0.02 | 0.59 | 0.00 | 1.10 | 0.00 | 0.00 | 0.85 | 0.00 | 0.12 | 0.00 | 1.44 | 1.44 |
| 1978 | 0.75 | 2.67 | 1.00 | 0.28 | -----z | 0.00 | 0.00 | 0.00 | -----z | 0.05 | -----z | 0.34 | -----z |
| 1979 | 1.45 | 0.20 | 0.95 | 0.00 | -----z | -----z | 0.05 | -----z | -----z | 0.06 | 0.00 | -----z | -----z |
| 1980 | 1.51 | -----z | 0.75 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -----z | 0.00b | -----z |
| 1981 | -----z | 0.28 | 1.18 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.89 | 1.92 | 0.88 | -----z | -----z |
| 1982 | 0.54 | 0.37 | 0.84 | 0.89 | 0.03 | 0.00 | 0.00 | 0.01 | 0.25 | 0.04a | 0.94 | 0.48 | 0.94a |
| 1983 | 0.87 | 1.94a | 2.88 | 0.42a | 0.00 | 0.00 | 0.00 | 1.08 | 0.12 | 0.24 | 0.03 | 1.32 | 2.88b |
| 1984 | 0.00 | 0.01 | 0.10 | 0.00 | 0.00 | 0.40 | 1.16 | 0.12 | 0.21 | 0.00 | 0.47 | 0.95 | 1.16 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1985 | 0.06 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 a | 0.00 | 0.00 a | 0.28 | 0.17 | 0.75 | 0.17 | 0.75 b |
| 1986 | 0.67 | 0.79 | 0.54 c | 0.04 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.66 | 0.40 a | 1.00 d |
| 1987 | 0.30 | 1.00 | 0.00 | 0.00 | 0.12 | 0.15 | 0.00 | 0.00 | 0.00 | 0.80 | 0.35 | 0.67 | 1.00 |
| 1988 | 1.00 | 0.20 | 0.00 | 0.24 | 0.15 | 0.00 | 0.97 | 0.00 | 0.00 | 0.00 | 0.20 | 0.25 | 1.00 |
| 1989 | 0.18 | 0.08 a | 0.18 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.25 a |
| 1990 | 0.50 | 0.03 | 0.10 | 0.05 | 0.04 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 b | 0.23 | 0.00 b | 0.50 d |
| 1991 | 0.34 a | 1.23 | 0.95 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.10 | 0.06 | 0.66 | 1.23 a |
| 1992 | 0.25 | 2.25 t | 0.65 | 0.34 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.00 | 1.12 | 2.25 t |
| 1993 | 1.00 | 1.14 a | 0.60 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.27 | 0.19 | 0.20 | 1.14 a |
| 1994 | 0.05 | 0.45 | 0.20 | 0.07 | 0.08 a | 0.00 | 0.00 | 0.00 | 0.01 | 0.35 | 0.20 | 0.18 | 0.45 a |
| 1995 | 1.61 | 0.37 | 1.34 | 0.07 | 0.00 | 0.33 | 0.00 | 1.94 | 0.00 | 0.00 | 0.00 | 0.36 | 1.94 |
| 1996 | 0.35 | 0.58 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 0.65 | 0.47 | 0.65 |
| 1997 | 0.21 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.13 | 0.00 | 0.77 | 0.12 | 0.33 | 1.20 | 1.20 |
| 1998 | 0.24 | 1.38 | 0.68 | 0.20 | 0.41 | 0.00 | 0.00 | 1.00 | 0.42 | 0.00 | 0.15 | 0.00 | 1.38 |
| 1999 | 0.42 | 0.08 a | 0.06 | 0.30 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.88 a |
| 2000 | 0.10 | 0.65 | 1.16 | 0.00 | 0.09 | 0.00 | 0.00 | 0.11 | 0.00 | 0.19 | 0.00 | 0.00 | 1.16 |
| 2001 | 1.01 | 1.70 | 1.05 | 0.80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 | 0.22 | 1.70 |
| 2002 | 0.00 | 0.19 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 w | 0.00 | 0.00 | 0.60 | 1.03 | 1.03 w |
| 2003 | 0.08 | 1.45 | 0.25 | 0.30 | 0.13 | 0.00 | 0.99 | 0.96 | 0.74 b | 0.00 | 0.00 p | 0.55 | 1.45 r |
| 2004 | 0.02 | 0.55 x | 0.40 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 o | 1.40 | 0.10 | 2.03 t | ----- z |
| 2005 | 1.85 p | 1.25 a | 0.35 e | 0.30 | 0.00 v | 0.00 x | 0.00 d | 0.16 o | 0.39 k | 1.50 n | 0.01 a | 0.22 | ----- z |
| 2006 | ----- z | 0.71 | 0.00 b | 0.13 | 0.00 t | 0.00 p | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | ----- z |
| 2007 | 0.00 | 0.00 | 0.00 | 0.00 | ----- z | ----- z | 0.00 | 0.50 | ----- z | ----- z | 0.27 | 0.00 | ----- z |
| 2008 | 0.86 | ----- z | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | ----- z | 0.00 a | ----- z |
| 2009 | 0.00 | 0.90 | 0.00 | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | 0.00 | 0.00 | 0.35 a | ----- z |
| 2010 | 0.79 a | 0.36 | 0.10 b | 0.00 | 0.00 | 0.00 | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z |
| 2011 | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z |
| 2012 | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | 0.00 b | 0.01 g | 0.00 f | 0.00 l | 0.00 p | 0.10 l | ----- z |
| 2013 | 0.00 p | 0.50 k | 0.00 o | 0.00 k | 0.00 k | 0.00 m | 0.00 i | 0.00 m | 0.00 j | 0.01 f | 0.55 i | 0.05 k | ----- z |
| 2014 | 0.01 g | 0.25 l | ----- z | 0.00 x | 0.47 o | 0.00 g | 0.00 e | 0.02 k | 0.00 l | 0.00 s | 0.00 x | 0.00 u | ----- z |
| 2015 | 0.25 q | ----- z | 0.00 j | 0.00 | 0.00 m | 0.00 m | 0.00 p | 0.00 g | 0.00 r | 0.50 i | 0.00 n | 0.00 o | ----- z |
| 2016 | 0.02 n | 0.20 h | 0.20 c | 0.15 d | 0.08 f | 0.00 j | 0.00 n | 0.00 j | 0.00 j | 0.00 n | 0.00 j | 0.26 h | ----- z |
| 2017 | 0.00 x | 1.00 t | 0.00 c | ----- z | 0.00 t | 0.00 g | 0.00 l | 0.00 i | 0.00 w | 0.00 n | ----- z | ----- z | ----- z |
| 2018 | 0.00 w | 0.00 q | ----- z | 0.04 t | 0.00 w | 0.00 n | 0.00 k | 0.00 n | 0.00 u | 0.00 m | 0.00 n | 0.00 x | ----- z |
| 2019 | ----- z | 0.02 v | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z |
| 2020 | 0.00 t | 0.00 n | 0.20 q | 0.00 j | 0.00 u | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z | ----- z |

Period of Record Statistics

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MEAN | 0.54 | 0.57 | 0.47 | 0.17 | 0.06 | 0.03 | 0.08 | 0.12 | 0.13 | 0.17 | 0.31 | 0.49 | 1.08 |
| S.D. | 0.57 | 0.63 | 0.58 | 0.26 | 0.15 | 0.09 | 0.23 | 0.34 | 0.25 | 0.34 | 0.42 | 0.53 | 0.63 |
| SKEW | 1.80 | 1.48 | 1.87 | 2.31 | 5.10 | 2.86 | 3.53 | 3.40 | 2.48 | 3.34 | 1.99 | 1.54 | 0.88 |
| MAX | 3.00 | 2.67 | 2.88 | 1.25 | 1.10 | 0.40 | 1.16 | 1.94 | 1.23 | 1.92 | 1.98 | 2.40 | 2.88 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| YRS | 74 | 74 | 77 | 78 | 72 | 70 | 79 | 72 | 69 | 74 | 71 | 73 | 50 |

# MOJAVE 2 ESE, CALIFORNIA (045758)

## Period of Record Monthly Climate Summary

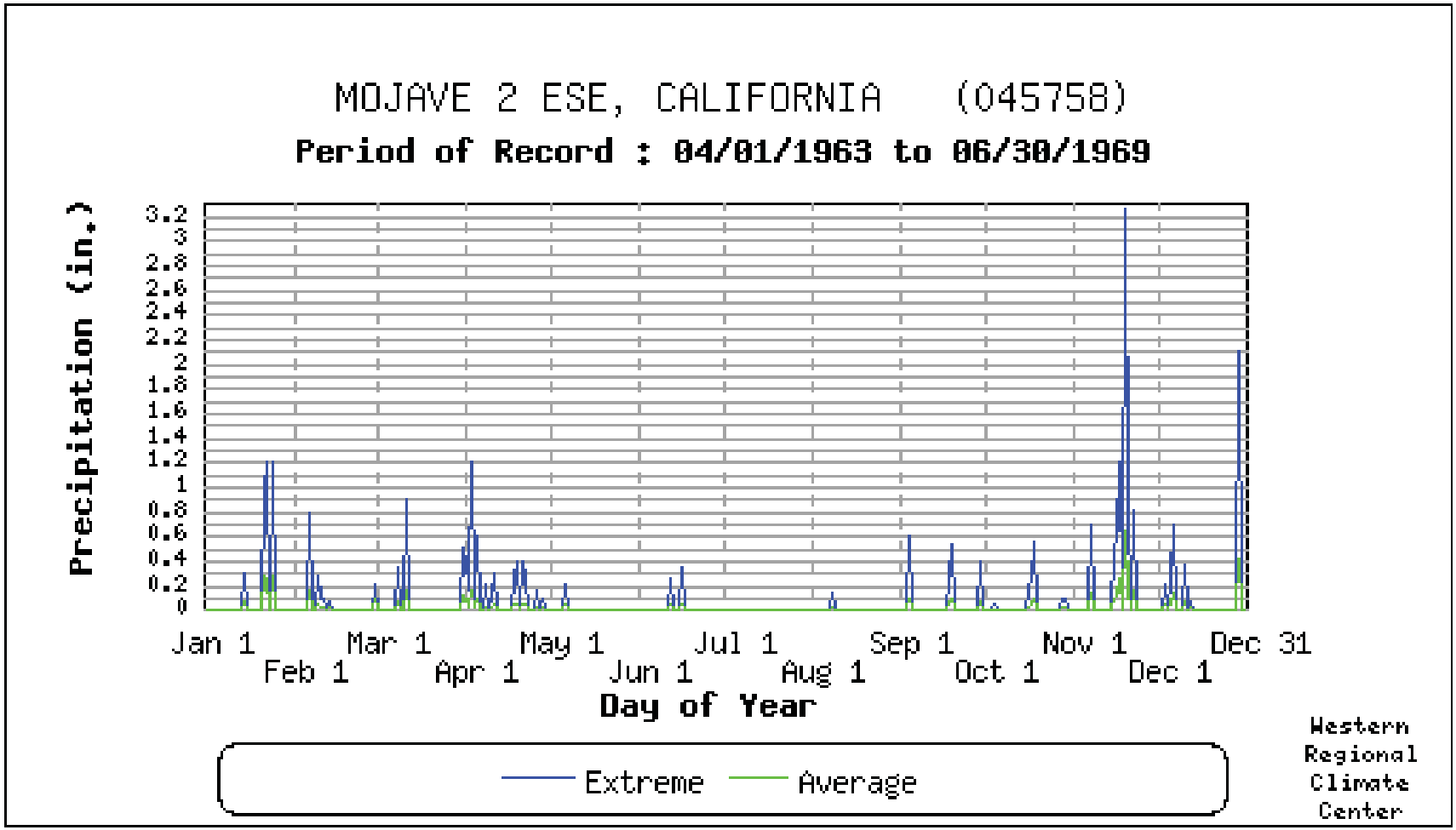
**Period of Record : 04/01/1963 to 06/30/1969**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 59.2 | 61.4 | 64.8 | 70.5 | 79.8 | 88.8 | 98.5 | 98.3 | 90.0 | 82.9 | 65.6 | 57.9 | 76.5 |
| Average Min. Temperature (F) | 32.4 | 34.2 | 38.3 | 43.9 | 52.3 | 60.8 | 67.8 | 66.2 | 56.7 | 49.3 | 39.5 | 32.1 | 47.8 |
| Average Total Precipitation (in.) | 1.13 | 1.07 | 0.33 | 0.69 | 0.04 | 0.09 | 0.00 | 0.03 | 0.30 | 0.20 | 1.73 | 0.74 | 6.34 |
| Average Total SnowFall (in.) | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Average Snow Depth (in.) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Percent of possible observations for period of record.
Max. Temp.: 88.3% Min. Temp.: 88.3% Precipitation: 90.5% Snowfall: 90.5% Snow Depth: 90.5%
Check Station Metadata or Metadata graphics for more detail about data completeness.

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MOJAVE 2 ESE, CALIFORNIA (045758)
Period of Record : 04/01/1963 to 06/30/1969
Precipitation (in.)
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Nov 1
Dec 1
Dec 31
Day of Year
Extreme
Average
Western Regional Climate Center

# MOJAVE 2 ESE, CALIFORNIA

## Period of Record General Climate Summary - Precipitation

| Station:(045758) MOJAVE 2 ESE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From Year=1963 To Year=1969 | | | | | | | | | | | | | | |
| | Precipitation | | | | | | | | | | | Total Snowfall | | |
| | Mean | High | Year | Low | Year | 1 Day Max. | | >= 0.01 in. | >= 0.10 in. | >= 0.50 in. | >= 1.00 in. | Mean | High | Year |
| | in. | in. | - | in. | - | in. | dd/yyyy or yyyymmdd | # Days | # Days | # Days | # Days | in. | in. | - |
| January | 1.13 | 3.90 | 1969 | 0.00 | 1965 | 1.20 | 22/1967 | 2 | 2 | 1 | 1 | 0.0 | 0.0 | 1964 |
| February | 1.07 | 4.90 | 1969 | 0.00 | 1965 | 0.78 | 06/1966 | 2 | 2 | 1 | 0 | 0.0 | 0.0 | 1964 |
| March | 0.33 | 1.10 | 1965 | 0.00 | 1969 | 0.91 | 11/1965 | 1 | 1 | 0 | 0 | 0.1 | 0.3 | 1966 |
| April | 0.69 | 2.07 | 1967 | 0.00 | 1966 | 1.20 | 03/1965 | 2 | 2 | 0 | 0 | 0.0 | 0.0 | 1963 |
| May | 0.04 | 0.20 | 1964 | 0.00 | 1963 | 0.20 | 06/1964 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1963 |
| June | 0.09 | 0.35 | 1969 | 0.00 | 1964 | 0.35 | 16/1969 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1963 |
| July | 0.00 | 0.00 | 1963 | 0.00 | 1963 | 0.00 | 01/1963 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1963 |
| August | 0.03 | 0.13 | 1963 | 0.00 | 1964 | 0.13 | 08/1963 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1963 |
| September | 0.30 | 1.38 | 1963 | 0.00 | 1964 | 0.60 | 04/1963 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1963 |
| October | 0.20 | 0.95 | 1963 | 0.00 | 1965 | 0.55 | 18/1963 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1963 |
| November | 1.73 | 3.77 | 1965 | 0.03 | 1964 | 3.25 | 19/1967 | 3 | 2 | 1 | 0 | 0.0 | 0.0 | 1963 |
| December | 0.74 | 2.54 | 1965 | 0.00 | 1963 | 2.10 | 29/1965 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1963 |
| Annual | 6.34 | 9.27 | 1965 | 1.14 | 1964 | 3.25 | 19671119 | 13 | 11 | 5 | 2 | 0.1 | 0.0 | 1964 |
| Winter | 2.94 | 8.80 | 1969 | 0.00 | 1965 | 2.10 | 19651229 | 5 | 4 | 2 | 1 | 0.0 | 0.0 | 1964 |
| Spring | 1.06 | 2.96 | 1965 | 0.36 | 1964 | 1.20 | 19650403 | 3 | 3 | 1 | 0 | 0.1 | 0.0 | 1964 |
| Summer | 0.11 | 0.38 | 1963 | 0.00 | 1964 | 0.35 | 19690616 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1963 |
| Fall | 2.22 | 3.77 | 1965 | 0.23 | 1964 | 3.25 | 19671119 | 4 | 3 | 2 | 0 | 0.0 | 0.0 | 1963 |

Table updated on Oct 31, 2012
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons
Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

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# MOJAVE 2 ESE, CA

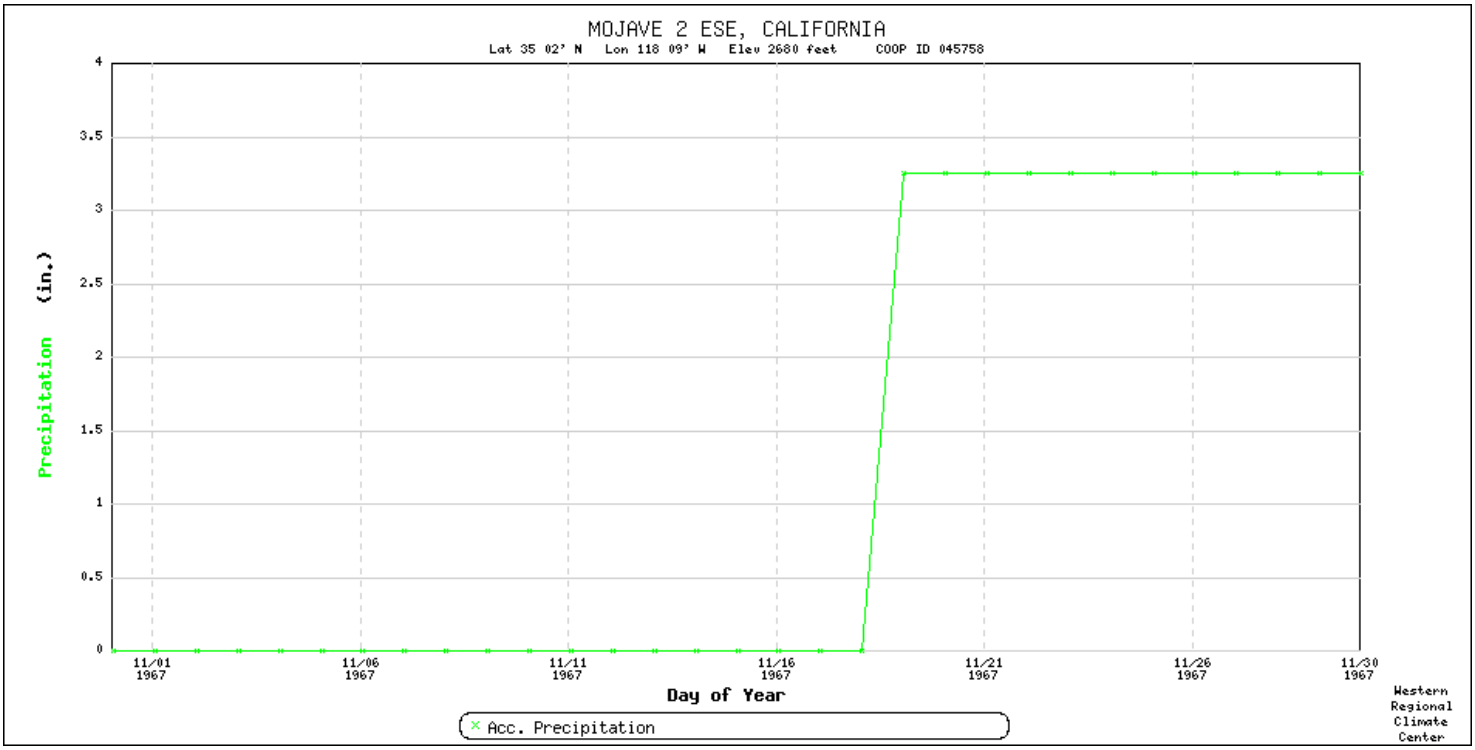
## Maximum of Precipitation (Inches)

### (045758)

File last updated on September 17, 2020
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual Months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

| YEAR(S) | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1963 | -----z | -----z | -----z | 0.15 | 0.00 | 0.25 | 0.00 | 0.13 | 0.60 | 0.55 | 0.85 | 0.00 | -----z |
| 1964 | 0.35 | 0.20 | 0.01 | 0.15 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.02 | 0.00 | 0.35 |
| 1965 | 0.00 | 0.00 | 0.91 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.20 | 2.10 | 2.10 |
| 1966 | 0.00 | 0.78 | 0.01 | 0.00 | -----z | 0.00 | 0.00 | 0.00 | 0.40 | 0.05 | 0.70 | 0.70 | -----z |
| 1967 | 1.20 | 0.00 | 0.50 | 0.39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.25 | -----z | -----z |
| 1968 | -----z | 0.27 | 0.35 | 0.00 | -----z | 0.00 | -----z | -----z | 0.00 | 0.00 | -----z | 0.00 | -----z |
| 1969 | 1.20c | 2.30g | 0.00 | 0.60 | 0.00 | 0.35 | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| Period of Record Statistics | | | | | | | | | | | | | |
| MEAN | 0.55 | 0.25 | 0.30 | 0.36 | 0.04 | 0.09 | 0.00 | 0.03 | 0.17 | 0.12 | 1.20 | 0.56 | 1.23 |
| S.D. | 0.61 | 0.32 | 0.37 | 0.43 | 0.09 | 0.15 | 0.00 | 0.06 | 0.27 | 0.22 | 1.22 | 0.91 | 1.24 |
| SKEW | 0.26 | 1.01 | 0.74 | 1.15 | 1.50 | 1.07 | 0.00 | 1.50 | 0.88 | 1.66 | 1.03 | 1.15 | 0.00 |
| MAX | 1.20 | 0.78 | 0.91 | 1.20 | 0.20 | 0.35 | 0.00 | 0.13 | 0.60 | 0.55 | 3.25 | 2.10 | 2.10 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.35 |
| YRS | 5 | 5 | 6 | 7 | 5 | 7 | 5 | 5 | 6 | 6 | 5 | 5 | 2 |

# Summary-Of-the-Day Graph




Return to Snotel Graph Options
Return to WRCC Weather Info page
Return to WRCC Home Page

# BACKUS RCH, CALIFORNIA (040418)

## Period of Record Monthly Climate Summary

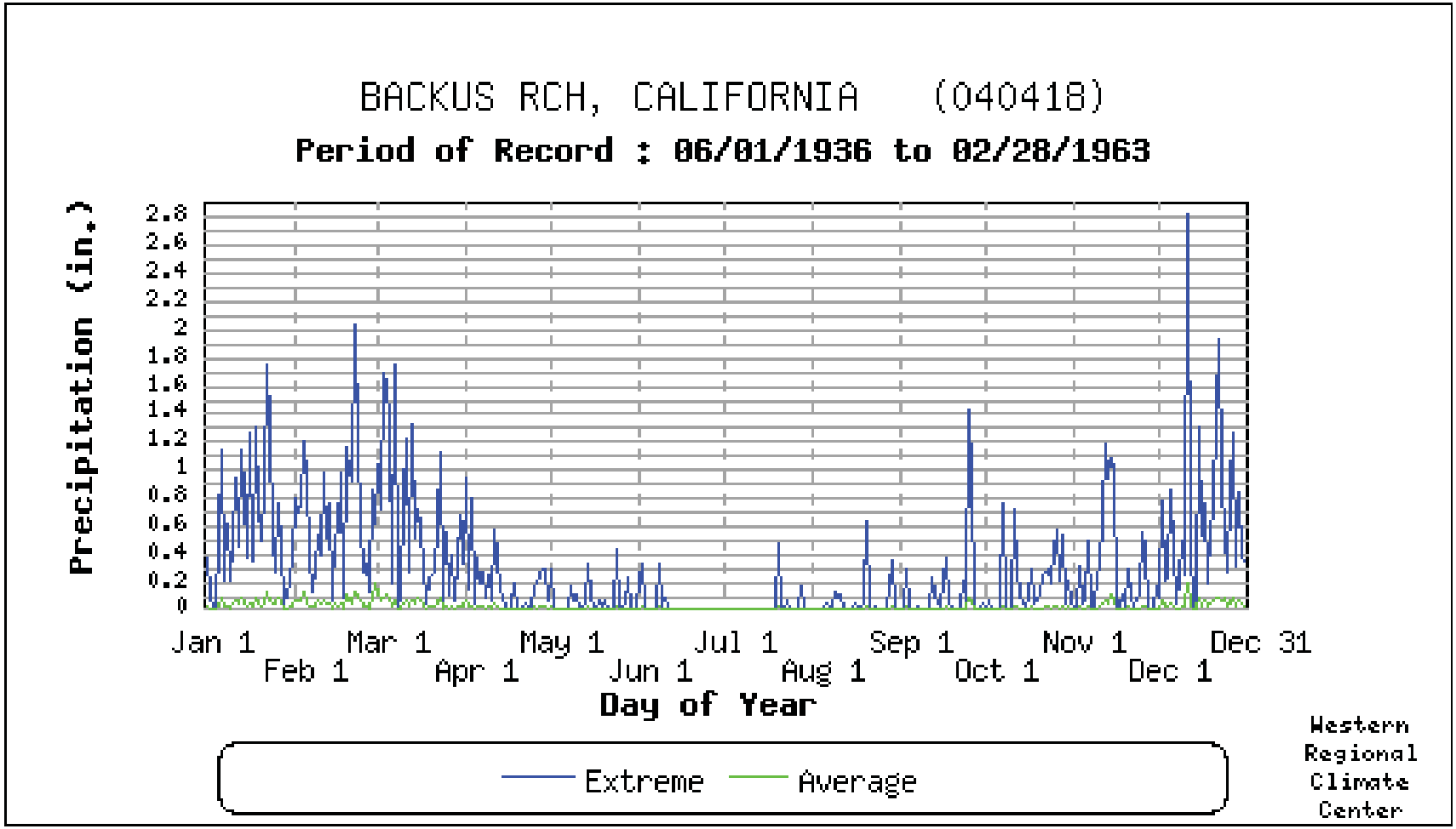
**Period of Record : 06/01/1936 to 02/28/1963**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 57.1 | 60.2 | 64.6 | 73.8 | 81.4 | 90.5 | 98.5 | 97.2 | 92.3 | 79.6 | 67.5 | 59.9 | 76.9 |
| Average Min. Temperature (F) | 29.9 | 33.8 | 37.8 | 45.7 | 52.3 | 61.3 | 67.8 | 65.7 | 58.4 | 47.4 | 35.9 | 31.5 | 47.3 |
| Average Total Precipitation (in.) | 1.08 | 1.33 | 1.17 | 0.35 | 0.09 | 0.02 | 0.03 | 0.08 | 0.19 | 0.23 | 0.45 | 1.16 | 6.18 |
| Average Total SnowFall (in.) | 0.9 | 0.2 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 2.1 |
| Average Snow Depth (in.) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Percent of possible observations for period of record.
Max. Temp.: 94.7% Min. Temp.: 94.7% Precipitation: 94.8% Snowfall: 95% Snow Depth: 93.4%
Check Station Metadata or Metadata graphics for more detail about data completeness.

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BACKUS RCH, CALIFORNIA (040418)
Period of Record : 06/01/1936 to 02/28/1963
Precipitation (in.)
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1
Aug 1
Sep 1
Oct 1
Nov 1
Dec 1
Dec 31
Day of Year
Extreme
Average
Western Regional Climate Center

# BACKUS RCH, CALIFORNIA

## Period of Record General Climate Summary - Precipitation

| Station:(040418) BACKUS RANCH | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From Year=1936 To Year=1963 | | | | | | | | | | | | | | |
| | Precipitation | | | | | | | | | | | Total Snowfall | | |
| | Mean | High | Year | Low | Year | 1 Day Max. | | >= 0.01 in. | >= 0.10 in. | >= 0.50 in. | >= 1.00 in. | Mean | High | Year |
| | in. | in. | - | in. | - | in. | dd/yyyy or yyyymmdd | # Days | # Days | # Days | # Days | in. | in. | - |
| January | 1.08 | 3.90 | 1943 | 0.00 | 1946 | 1.74 | 22/1943 | 4 | 2 | 1 | 0 | 0.9 | 17.5 | 1949 |
| February | 1.33 | 5.63 | 1944 | 0.00 | 1953 | 2.03 | 22/1944 | 4 | 3 | 1 | 0 | 0.2 | 2.0 | 1939 |
| March | 1.17 | 5.19 | 1941 | 0.00 | 1953 | 1.74 | 07/1952 | 4 | 2 | 1 | 0 | 0.9 | 13.0 | 1952 |
| April | 0.35 | 2.26 | 1958 | 0.00 | 1954 | 0.94 | 01/1958 | 2 | 1 | 0 | 0 | 0.0 | 0.0 | 1943 |
| May | 0.09 | 0.72 | 1941 | 0.00 | 1938 | 0.43 | 24/1941 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1938 |
| June | 0.02 | 0.33 | 1938 | 0.00 | 1937 | 0.33 | 08/1938 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1936 |
| July | 0.03 | 0.47 | 1946 | 0.00 | 1938 | 0.47 | 20/1946 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1943 |
| August | 0.08 | 0.63 | 1939 | 0.00 | 1937 | 0.63 | 20/1939 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1943 |
| September | 0.19 | 1.62 | 1939 | 0.00 | 1936 | 1.41 | 25/1943 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1943 |
| October | 0.23 | 1.41 | 1957 | 0.00 | 1938 | 0.75 | 07/1945 | 1 | 1 | 0 | 0 | 0.0 | 0.0 | 1939 |
| November | 0.45 | 2.67 | 1944 | 0.00 | 1936 | 1.18 | 12/1944 | 2 | 1 | 0 | 0 | 0.0 | 0.0 | 1942 |
| December | 1.16 | 6.14 | 1943 | 0.00 | 1950 | 2.81 | 11/1943 | 4 | 2 | 1 | 0 | 0.2 | 2.5 | 1941 |
| Annual | 6.18 | 17.34 | 1941 | 1.30 | 1953 | 2.81 | 19431211 | 25 | 13 | 4 | 1 | 2.1 | 17.5 | 1949 |
| Winter | 3.57 | 12.34 | 1944 | 0.30 | 1961 | 2.81 | 19431211 | 12 | 7 | 2 | 1 | 1.3 | 17.5 | 1949 |
| Spring | 1.61 | 7.65 | 1941 | 0.00 | 1959 | 1.74 | 19520307 | 8 | 4 | 1 | 0 | 0.9 | 13.0 | 1952 |
| Summer | 0.12 | 0.84 | 1938 | 0.00 | 1940 | 0.63 | 19390820 | 1 | 0 | 0 | 0 | 0.0 | 0.0 | 1943 |
| Fall | 0.87 | 2.67 | 1944 | 0.00 | 1956 | 1.41 | 19430925 | 4 | 2 | 1 | 0 | 0.0 | 0.0 | 1943 |

Table updated on Oct 31, 2012
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons
Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

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# BACKUS RANCH, CA

## Maximum of Precipitation (Inches)

### (040418)

File last updated on September 17, 2020
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not
sum (or average) to the long-term annual value.
MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5
Individual Months not used for annual or monthly statistics if more than 5 days are missing.
Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

| YEAR(S) | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | ANN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1936 | -----z | -----z | -----z | -----z | -----z | -----z | 0.01 | -----z | 0.00 | 0.29 | 0.00 | 1.26 | -----z |
| 1937 | 0.18a | 0.15 | 0.68 | 0.05 | 0.03 | 0.00 | 0.03 | 0.00 | 0.00 | 0.02 | 0.00 | 0.36 | 0.68a |
| 1938 | 0.37 | 0.86 | 1.68 | 0.17 | 0.00 | 0.33 | 0.00 | 0.35 | 0.37 | 0.00 | 0.00 | 0.54w | 1.68w |
| 1939 | 0.88 | 0.14 | 1.12 | 0.14 | 0.32 | 0.00 | 0.01 | 0.63 | 0.93 | 0.00 | 0.25 | 0.33 | 1.12 |
| 1940 | 0.60 | 0.77 | 0.32 | 0.18 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.57 | 0.01 | 0.75 | 0.77 |
| 1941 | 0.94 | 0.98 | 1.32 | 0.57 | 0.43 | 0.00 | 0.00 | 0.05 | 0.00 | 0.28 | 0.16 | 0.84 | 1.32 |
| 1942 | 0.04 | 0.30 | 0.52 | 0.16 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.53 | 0.00 | 0.11 | 0.53 |
| 1943 | 1.74 | 1.19 | 1.61 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 1.41 | 0.06 | 0.11 | 2.81 | 2.81 |
| 1944 | 0.34 | 2.03 | 0.70 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.18 | 0.16 | 2.03 |
| 1945 | 0.02 | 0.74 | 1.03 | 0.10 | 0.00 | 0.00 | 0.00 | 0.06 | 0.29 | 0.75 | 0.00 | 1.92a | 1.92a |
| 1946 | 0.00 | 0.94u | 0.66 | 0.17 | 0.05 | 0.00 | 0.47 | 0.01 | 0.05 | 0.08 | 0.94 | 0.86 | 0.94u |
| 1947 | 0.08 | 0.13 | 0.26 | 0.09 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.08 | 0.00 | 0.85 | 0.85 |
| 1948 | 0.00 | -----z | 0.54 | 0.15 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.34 | -----z |
| 1949 | 0.83 | 0.26 | 0.13 | 0.01 | 0.07 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.29 | 0.49 | 0.83 |
| 1950 | 0.21 | 0.13 | 0.15 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00a | 0.03 | 0.00 | 0.24a |
| 1951 | 0.36 | 0.06 | 0.04 | 0.29 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 | 0.15 | 0.74 | 0.74 |
| 1952 | 1.30 | 0.26 | 1.74a | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.99 | 0.78 | 1.74a |
| 1953 | 0.12 | 0.00 | 0.00 | 0.29 | 0.23 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.31 | 0.08 | 0.31 |
| 1954 | 0.76 | 0.76 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.64 | 0.25 | 0.76 |
| 1955 | 0.85g | 0.10 | 0.01 | 0.06 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.23 | 0.85g |
| 1956 | 0.75 | 0.00 | 0.00 | 0.51 | 0.17 | 0.00g | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.75g |
| 1957 | 1.13 | 0.62 | 0.31 | 0.18 | 0.02 | 0.08 | 0.00 | 0.00 | 0.00 | 0.70 | 0.31 | 1.29 | 1.29 |
| 1958 | 0.33 | 1.20 | 1.22 | 0.94 | 0.00 | 0.00 | 0.16 | 0.00 | 0.20 | 0.00 | 0.09 | 0.00 | 1.22 |
| 1959 | 1.13 | 0.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.48 | 1.13 |
| 1960 | 0.45 | 0.61 | 0.00 | 0.25 | 0.00 | 0.00 | -----z | -----z | 0.23 | 0.00 | 0.49 | 0.01 | -----z |
| 1961 | 0.29 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | -----z | -----z | 0.00 | 0.00 | 0.55 | 0.66 | -----z |
| 1962 | 0.75 | 0.98 | 0.19 | 0.00 | 0.00 | 0.00 | -----z | -----z | -----z | -----z | 0.00o | 0.00 | -----z |
| 1963 | 0.05 | 0.39 | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z | -----z |
| Period of Record Statistics | | | | | | | | | | | | | |
| MEAN | 0.53 | 0.53 | 0.56 | 0.18 | 0.06 | 0.03 | 0.03 | 0.06 | 0.15 | 0.15 | 0.26 | 0.60 | 1.13 |
| S.D. | 0.46 | 0.50 | 0.57 | 0.21 | 0.12 | 0.09 | 0.10 | 0.15 | 0.33 | 0.24 | 0.34 | 0.66 | 0.66 |
| SKEW | 0.81 | 1.15 | 0.81 | 2.13 | 1.89 | 2.96 | 3.88 | 3.02 | 2.88 | 1.45 | 1.43 | 1.76 | 0.96 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAX | 1.74 | 2.03 | 1.74 | 0.94 | 0.43 | 0.33 | 0.47 | 0.63 | 1.41 | 0.75 | 1.18 | 2.81 | 2.81 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 |
| YRS | 26 | 25 | 26 | 26 | 26 | 25 | 24 | 23 | 26 | 26 | 26 | 26 | 18 |

in the San Joaquin Valley, 0.60 in the Desert region, 0.55 in the Antelope Valley, Tehachapi Mountains, and Coast Ranges, and 0.45 in the Northern Sierra Nevada Mountains of the County. From Figure D-4, a minimum duration of 5 minutes is used for rational method studies.

## D.6. RUNOFF COEFFICIENT

The ***runoff coefficient*** (C) is the ratio of rate of runoff to the rate of rainfall at an ***average intensity*** (I) when the total drainage area is contributing. The selection of the runoff coefficient depends on rainfall intensity, drainage area slope, type and amount of vegetative cover, infiltration capacity of the ground surface, and various other factors.

Since one acre-inch/hour is equal to 1.008 cfs, the rational formula is used to estimate a peak flow rate in cfs. The runoff coefficient is assumed to be a function of the impervious and pervious area fractions, an infiltration rate, $F_p$, for the pervious area, and the effects of watershed detention. Runoff coefficient curves can be developed using the relationship:

$$C = \begin{cases} 0.90\ (a_i + ap(I-F_p)/I), \text{ for I greater than } F_p \\ 0.90\ a_i, \text{ for I less than or equal to } F_p \end{cases} \quad (D.4)$$

= 0.90(1.72-0.66)/1.72 = 0.55

I > Fp, so above eq'n applies

where the proportion factor of 0.90 is a calibration constant determined by an average fit between the rational method and design storm unit hydrograph (see Section E) peak flow rate estimates, and where

C = runoff coefficient

I = rainfall intensity (inches/hour) From NOAA 14, I for the greatest 1 hour rainfall is 1.72 inches

$F_p$ = infiltration rate for pervious areas (inches/hour) (see Section C.7.4) 0.66

$a_i$ = ratio of impervious area to total area (decimal fraction) 0

$a_p$ = ratio of pervious area to total area (decimal fraction), ($a_p = 1 - a_i$) 1

## D.7. PEAK FLOW RATE FORMULA

Combining Equations (D.1) and (D.4);

$$Q = 0.90\ (a_i + a_p(I-F_p)/I)IA$$

$$= 0.90\ (a_iI + a_pI - a_pF_p)A$$

$$= 0.90\ (I(a_i+a_p) - a_pF_p)A$$

$a_i + a_p = 1$; $a_pF_p = F_m$; Therefore:

$$Q = .90\ (I - F_m)A \quad (D.5)$$

It is noted that should Ia be greater than $P_{24}$ in (C.3), then $Y_j$ is defined to be zero. In this manual, the notation Y and $Y_j$ will represent the ***runoff yield fraction***, rather than the volume of runoff.

If the area under study contains several (say m) CN designations, then the yield, Y, for the total area must represent the net effect of the several curve numbers. By weighing each of the subarea yield values according to the respective areas,

$$Y = \frac{Y_1 A_1 + \ldots + Y_m A_m}{A_1 + A_2 + \ldots + A_m} \qquad \text{(C.4)}$$

where each $Y_j$ follows from (C.3).

### C.7.3. Low Loss Rate, F*

In design storm runoff hydrograph studies, the following formula is used to estimate that portion of rainfall to be attributed to watershed losses:

$$\overline{Y} = 1 - Y \qquad \text{(C.5)}$$

where

$\overline{Y}$ = catchment low loss fraction

Y = catchment 24-hour storm runoff yield fraction computed from (C.4)

Using the low loss fraction, $\overline{Y}$, the corresponding low loss rate, F*, is given by

$$F^* = \overline{Y} \cdot I \qquad \text{(C.6)}$$

where I is the rainfall intensity and F* has units of inches/hour. Use of F* enables the design storm 24-hour storm runoff yield to approximate the yield values obtained from the CN approach (see Figure C-4).

### C.7.4. Infiltration Rates

Soil infiltration rates have been estimated for each of the soil groups by laboratory studies and measurements. These measurements show that an initially dry soil will have an associated infiltration rate which essentially decreases with time as the soil becomes wetted. As the soil is subjected to continual heavy rainfall, this infiltration rate approaches a minimum (usually within about 30 minutes) which represents the infiltration capacity of the soil.

When sufficient stream gauge information is available, infiltration rates for unit hydrograph hydrology can be estimated from a study of rainfall-runoff relationships of major storms. Where such data is not available, infiltration rates for pervious areas as a function of CN can be estimated using Figures C-2 and C-5. Loss rates for pervious areas estimated from the Figure C-5 curve was found to be generally consistent with values developed from rainfall-runoff reconstitution studies in San Bernardino County, California watersheds. Due to the similarities in hydrologic and meteorological conditions in Kern and San Bernardino Counties, the curves of Figure C-5 can be used in estimating infiltration rates for Kern County watersheds.

### C.7.5. Estimation of Catchment Maximum Loss Rates, $F_m$

The infiltration rate selected from Figure C-5 applies to the ***pervious*** area fraction of the watershed. The infiltration rate assumed for an ***impervious*** surface is 0.0 inch/hour. The maximum loss rate, $F_m$, for a catchment is therefore given by

$$F_m = a_p F_p \qquad (C.7)$$

where $a_p$ is the pervious area fraction, and $F_p$ is the infiltration rate for the pervious area.

Should a catchment contain several $F_p$ values, the composite $F_m$ value is determined as a simple area average of the several $F_m$ values.

### C.7.6. Design Storm Loss Rates

In design storm runoff hydrograph studies, a 24-hour duration storm pattern is used to develop the time distribution of effective rainfall over the watershed. The effective rainfall quantities are determined by subtracting the watershed losses from the design storm rainfall.

The loss rate used for a particular catchment is a combination of the maximum loss rate $F_m$ and the low loss rate F*. F* is used as the loss rate unless F* exceeds $F_m$, in which case $F_m$ is used as the loss rate. That is, $F_m$ serves as the maximum loss rate. Typically in 100-year storm studies, F* serves as the loss rate for the entire storm pattern except for the most intense rainfalls where $F_m$ would apply. However, for lower frequency storm studies such as the 5-year return event, F* often applies for the entire 24-hour storm pattern. The example problem of Section E provides an illustration in the use of F* and $F_m$ values. Figure C-6 illustrates the loss rate function used with the design storm.

## C.8. DESERT HYDROLOGY LOSS RATES

For desert catchments, a field investigation will be required for most hydrologic studies to determine the pertinent drainage area characteristics. The extent of the required field study will depend on the size of the drainage area and the complexity of the drainage problem. Many features such as channel-flow pattern, flow distribution, channel diversions, and type and density of the vegetative cover, may not be apparent from

contour maps or air photos. The field study may also indicate the need for low level air photos to solve complex drainage problems.

### C.8.1. Hydrologic Soil-Cover Complex

A determination of vegetative cover types, hydrologic condition of cover types, and hydrologic soil group must be made for the drainage area. Ordinarily only broad categories of soils and cover types are delineated. Hydrologic soil cover complexes most commonly encountered in desert areas are given in Figure C-7 together with the associated curve numbers (CN). Curve numbers and, consequently, direct runoff varies with vegetation type, vegetative cover density, and hydrologic soil group.

### C.8.2. Hydrologic Cover Types

Vegetative types are divided into the following groups:

Desert Brush: Includes such plants as mesquite, creosote bush, black bush, catclaw, cactus, etc. - desert brush is typical of lower elevations and low annual rainfall.

Herbaceous: Includes short desert grasses with some brush - herbaceous is typical of intermediate elevations and higher annual rainfall than desert areas.

Mountain Brush: Mountain brush mixtures of oak, aspen, mountain mahogany, manzanita, bitter brush, maple, etc. - mountain brush is typical of intermediate elevations and generally higher annual rainfall than herbaceous areas.

Juniper-Grass: Juniper areas mixed with varying grass cover that is generally heavier than desert grasses due to higher annual precipitation - typical of higher elevations.

Ponderosa Pine: Ponderosa pine forests typical of high elevations and high annual precipitation.

### C.8.3. Hydrologic Cover Density

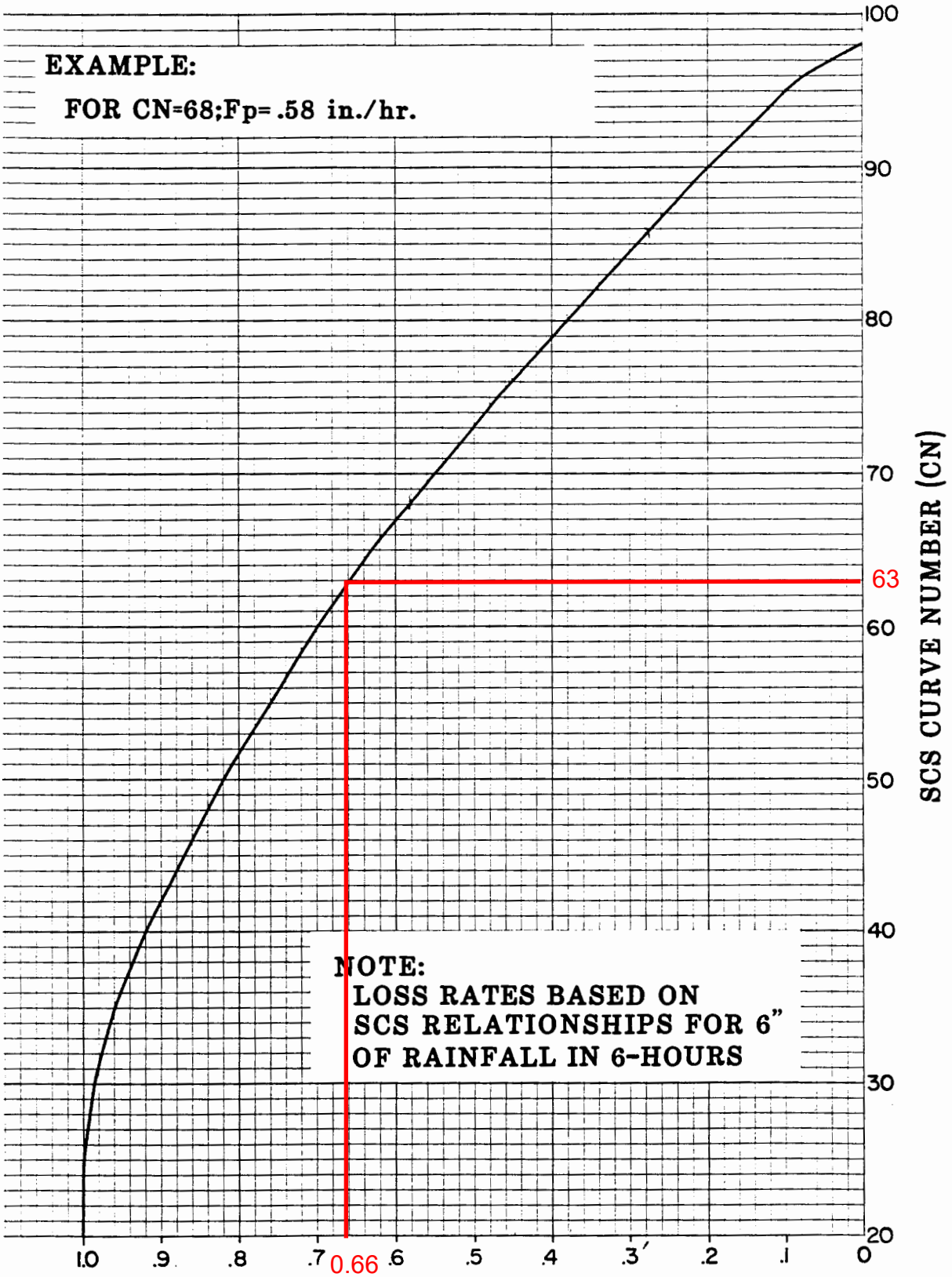
Hydrologic cover density is defined as the percent of the ground surface covered by the crown canopy of live plants and litter.

Three broad ranges of vegetative cover density have been established:

Poor: 0% - 20% Vegetative cover

Fair: 20% - 40% Vegetative cover

Good: Over 40% Vegetative cover




Curve number obtained from "Part 630 Hydrology National Engineering Handbook."

**KERN COUNTY**
**Hydrology Manual**

**INFILTRATION RATE FOR PERVIOUS AREAS VERSUS SCS CURVE NUMBERS**

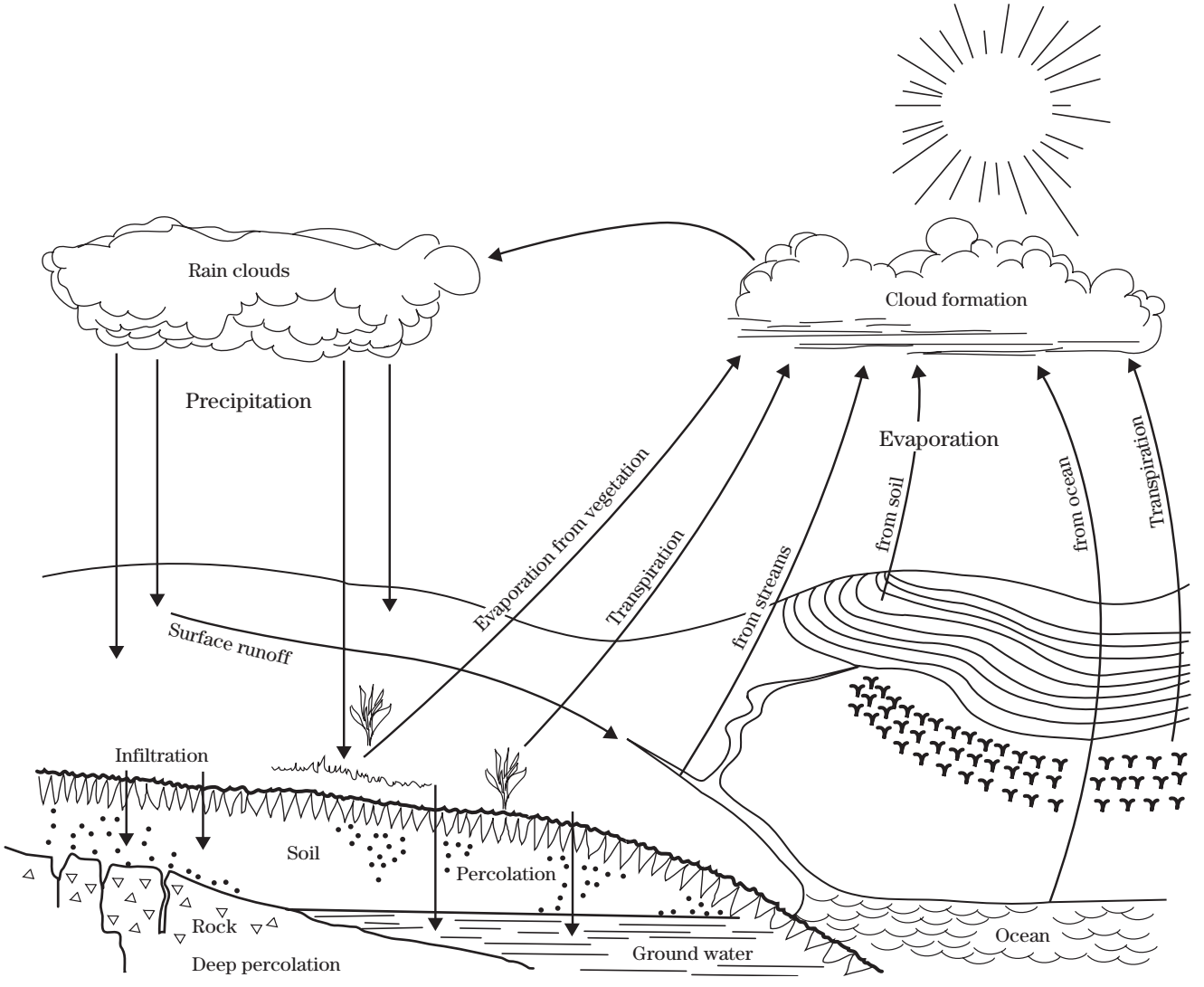
FIGURE C-5

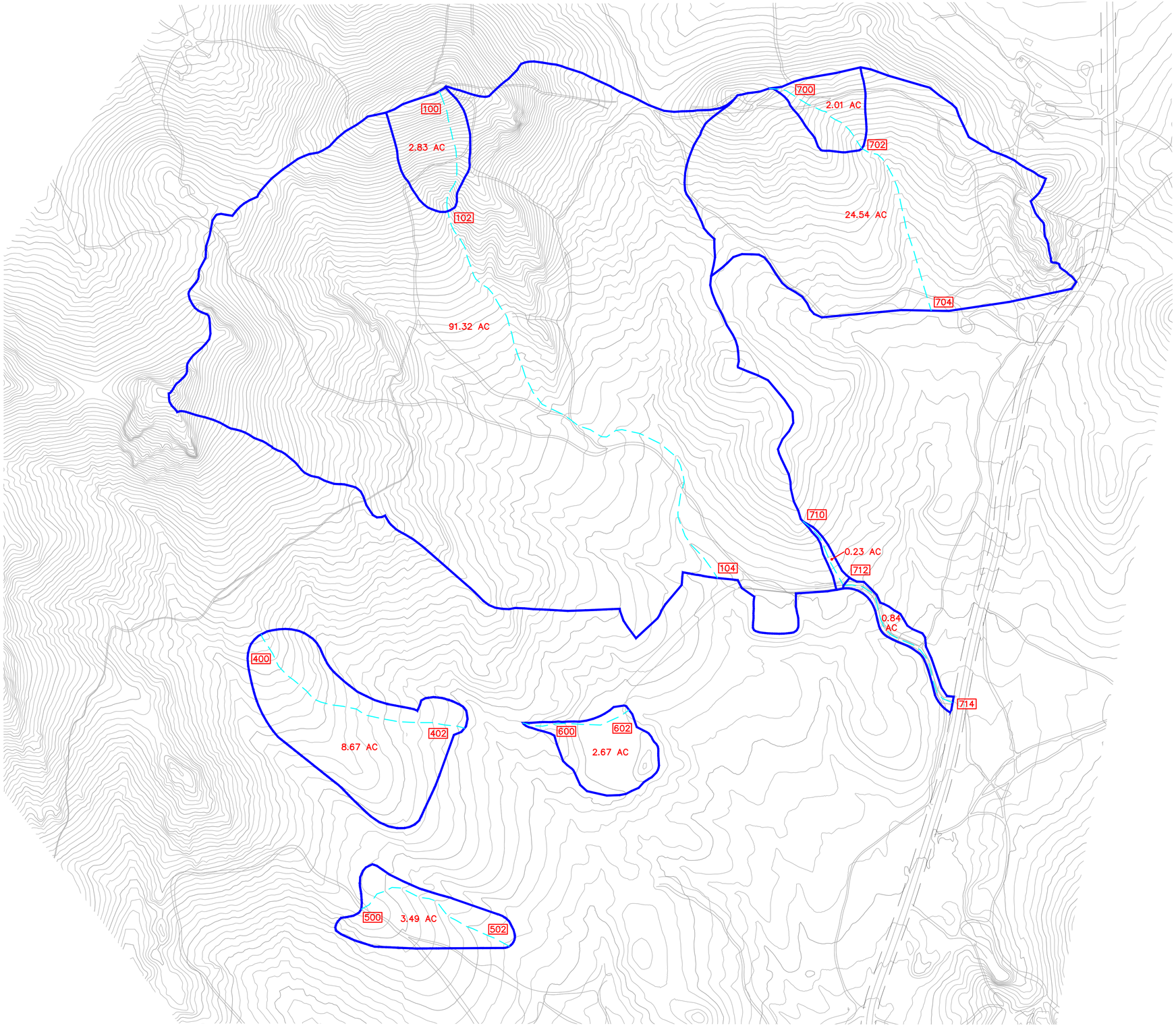
United States
Department of
Agriculture

**Natural
Resources
Conservation
Service**

Part 630 Hydrology
National Engineering Handbook

# Chapter 9 Hydrologic Soil-Cover Complexes






GRAPHIC SCALE

200 0 100 200 400

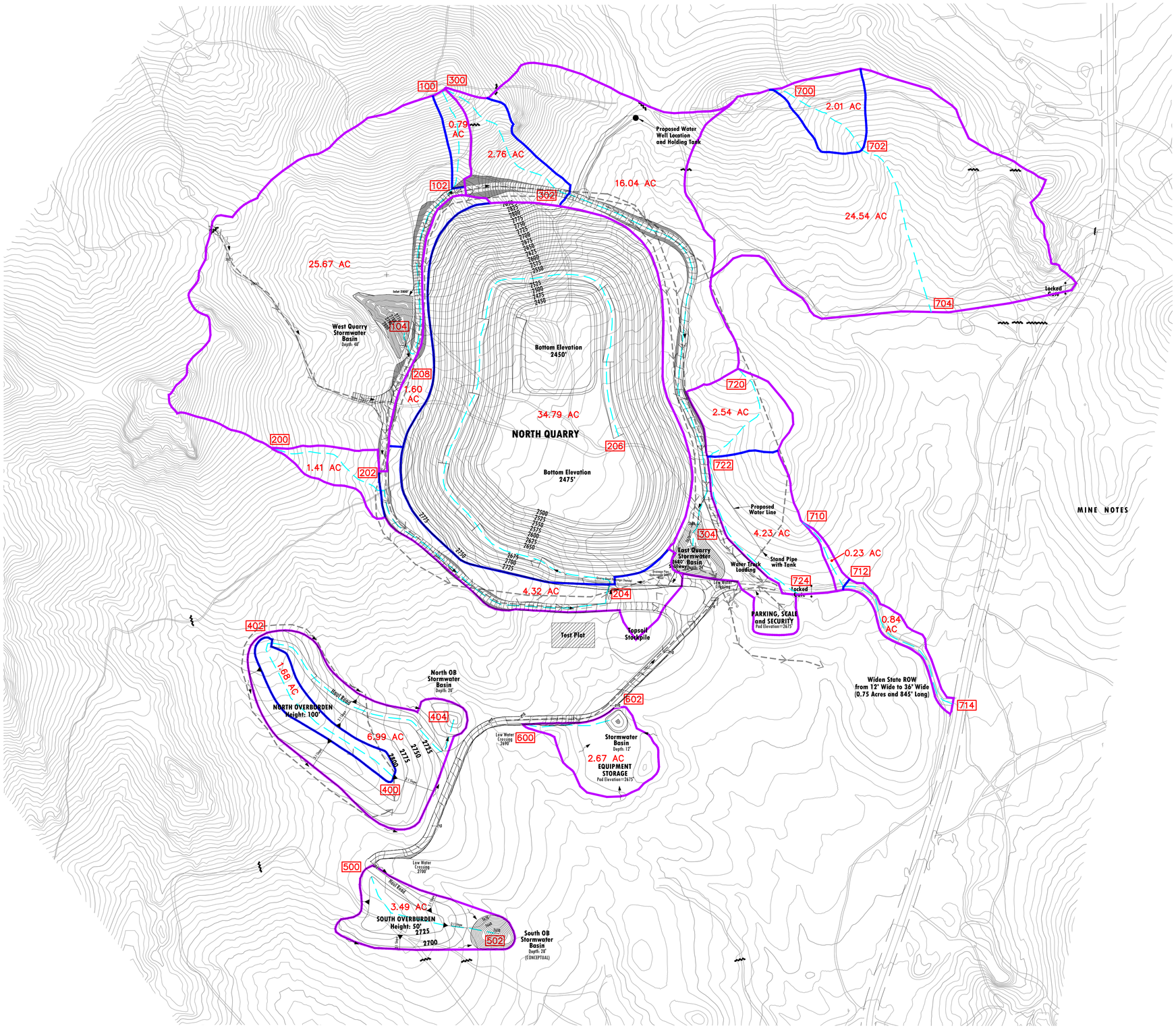
1 INCH = 200 FEET

LEGEND:

- DRAINAGE BASIN BOUNDARY
- OVERLAND FLOW PATH
- 1.41 AC DRAINAGE BASIN AREA
- 100 RATIONAL METHOD NODE NUMBER

NOTE:
THE CONTOUR INTERVAL OF THE EXISTING TOPOGRAPHIC MAPPING IS 5 FEET.

# GEM HILL QUARRY
## EXISTING CONDITION
## RATIONAL METHOD WORK MAP




LEGEND:

- MAJOR DRAINAGE BASIN BOUNDARY
- MINOR DRAINAGE BASIN BOUNDARY
- OVERLAND FLOW PATH
- 1.41 AC DRAINAGE BASIN AREA
- 100 RATIONAL METHOD NODE NUMBER

NOTES:

THE MAJOR DRAINAGE BOUNDARIES REPRESENT OVERALL AREAS TRIBUTARY TO A RETENTION BASIN OR THE QUARRY. THE MINOR DRAINAGE BASIN BOUNDARIES REPRESENT MINOR DRAINAGE SUBAREAS WITHIN A MAJOR DRAINAGE BASIN.

THE CONTOUR INTERVAL OF THE EXISTING TOPOGRAPHIC MAPPING IS 5 FEET.

THE CONTOUR INTERVAL OF THE PROPOSED QUARRY, NORTH OVERBURDEN AREA, SOUTH OVERBURDEN AREA IS 25 FEET. THE CONTOUR INTERVAL OF THE REMAINING PROPOSED AREAS IS 2 FEET.

THE ROADWAY BETWEEN THE SOUTH OVERBURDEN AREA AND PARKING/SCALE/SECURITY AREA SHALL BE GRADED TO GENERALLY FOLLOW THE EXISTING DRAINAGE PATTERNS.

# GEM HILL QUARRY
## PROPOSED CONDITION
## RATIONAL METHOD WORK MAP

Appendix I.2

# Water Supply Assessment Gem Hill Project

SESPE CONSULTING, INC.

374 Poli Street, Suite 200 • Ventura, California 93001

# WATER SUPPLY ASSESSMENT

## GEM HILL PROJECT

**CalPortland Company**
Kern County, California

November 5, 2020

| | |
|---|---|
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**Water Supply Assessment**
**Gem Hill Project**
CalPortland Company

November 5, 2020

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Figure 3 – Average Monthly Temperature, Rainfall and Evapotranspiration for Fremont Valley Groundwater Basin

SESPE CONSULTING, INC.

374 Poli Street, Suite 200 • Ventura, California 93001

# WATER SUPPLY ASSESSMENT
## Gem Hill Project
CalPortland Company

November 5, 2020

## 1.0 EXECUTIVE SUMMARY

The CalPortland Company intends to develop and operate the Gem Hill Project, a proposed pozzolan extraction facility on approximately 210 acres in Kern County, California (Project). The pozzolan material would be sourced from a volcanic tuff. Approximately 500,000 tons of the pozzolan deposit is planned to be extracted annually over a 30-year period. As part of the operation, groundwater pumped from an onsite well will be used to control dust and periodically to support revegetation during site reclamation. Total anticipated Project water needs are a modest 18 acre-feet per year.

To assist Kern County in its environmental review of the Gem Hill Project, this Water Supply Assessment (WSA) was prepared to evaluate the Project's potential effect on existing groundwater supplies and uses, its conformity with existing water quality control or groundwater management plans, and whether the water supply is sufficient to meet the projected water demand over a 20-year period during normal, single year and multiple dry years.

The Project site is situated within the jurisdictional boundaries of the Lahontan Region Basin Plan, which establishes surface and groundwater standards for the region according to designated beneficial uses. The water uses for the Project are consistent with the policies set forth in the Basin Plan. Therefore, implementation of the Project would not create a conflict with the Lahontan Region Basin Plan.

The Project site lies outside of any adopted groundwater basin management plan, except for an approximately 1.4-acre triangular section of the Antelope Valley Groundwater Basin that extends onto the southern edge of the site. Moreover, the proposed location for the groundwater supply well is located well outside of both the Antelope Valley Groundwater Basin and the Freemont Valley Groundwater Basin.

The source of water is a local basalt aquifer that underlies the Project site. This aquifer is spatially constrained, as the basalt and the overlying tuffaceous rocks are cross-cut by faults. A review of the exploratory drilling program completed by CalPortland indicates groundwater was encountered at 335 feet below ground surface (bgs) at a location south of the proposed water supply well. This groundwater depth appears to be roughly coincident with the top of the basalt unit. Initial airlift tests performed during the exploratory drilling indicate the basalt aquifer underneath the Project site is capable of producing initial yields of 45 gallons per minute (gpm) or greater, varying with location and depth.

Replenishment of the local basalt aquifer is believed to occur by infiltration and inflow from the adjacent areas. In order to conservatively assess supply sufficiency, however, water demand over the life of the Project was estimated and compared to the available water supply, assuming no replenishment of the local aquifer. This is a very conservative assumption. The total estimated storage capacity of the local

aquifer is 1,315 acre-feet volumetrically.

Over the life of the Project, the total water demand is approximately 540 acre-feet. With the conservative premise that no replenishment of the local basalt aquifer occurs, the Project's estimated demand is 41% of the total capacity. Accordingly, there is sufficient water supply over the duration of the Project.

To determine if the Project would potentially impact the pumping of groundwater from nearby wells, publicly available well records were reviewed and the locations of the wells were evaluated in relation to the proposed water supply well location. The nearest groundwater supply wells identified with publicly available information occur at distances of about 3,000 feet from the Project well location. These two groundwater supply wells draw water from entirely different hydrogeologic units than the constrained basalt aquifer. With groundwater sourced from these different units and the nominal pumping rate planned for the proposed water supply well, neither short- or long-term pumping of groundwater is anticipated to create any impact to these nearby wells.

There is also a residence approximately 1,800 feet to the east of the proposed Project well, which is along Mojave-Tropico Road; however, no documentation was found indicating whether there is a water supply well at this location. Notwithstanding the lack of available water supply well data, given the presence of faulting in the vicinity of the Project site, any well at this residence would be expected to withdraw water form an entirely different hydrogeologic unit that the constrained basalt aquifer. Even if located in the same aquifer, however, the average annual residential consumption of water is approximately 0.41 acre-feet per year (Aquacraft Water Engineering and Management, 2011). Added to the Project's anticipated water needs, and conservatively assuming no replenishment, total estimated demand over the life of the Project is 42% of the total capacity. Therefore, the Project would have no significant impact on the neighboring water use.

This WSA also considered the sufficiency and certainty of the proposed groundwater supply under single dry and multiple dry years. This assessment determined the supply is sufficient to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years (see 2019 Freemont Basin Integrated Regional Water Management Plan (IRWMP)).

## 2.0 INTRODUCTION

### 2.1 Project Background

This WSA has been prepared for the CalPortland Company (CalPortland) Gem Hill Project in support of Kern County's environmental review of the Project, as required by the California Environmental Quality Act (CEQA). This WSA follows the requirements of California Water Code § 10910, and provides the pertinent water supply information pursuant to California Senate Bill 610, as described in the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to Assist Water Suppliers, Cities, and Counties in Integrating Water and Land Use Planning* (Department of Water Resources, 2003).

The Gem Hill Project proposes to extract natural pozzolan materials, which will be used in the production of cement products at other facilities. The Project site location is provided in Figure 1. The site is located near the City of Rosamond, in Kern County, immediately west of Mojave Tropico Road near the intersection of Mojave Tropico Road and Dawn Road. It is bound by Gem Hill to the west, the Gem Hill ridgeline to the north, and Mojave Tropico Road to the east. The Project site coordinates are Latitude

34.917331° and Longitude -118.219410°.

## 2.2 Regulatory Context

Under the California Water Code statute as revised, and in addition to all the previously existing requirements for WSAs, if the proposed Project's water supply includes groundwater, the WSA must now also include the following as part of its informational content: a description of the groundwater basin(s) that will supply the project; for court- or SWRCB-adjudicated basins, a copy of the order or decree determining legal pumping rights; and, for unadjudicated basins designated as high- or medium-priority pursuant to the Sustainable Groundwater Management Act (SGMA), whether the California Department of Water Resources (DWR) has identified the basin as being subject to critical conditions of overdraft and whether a groundwater sustainability agency (GSA) has adopted a Groundwater Sustainability Plan (GSP) or approved alternative, and, if so, a copy of the same (Water Code, § 10910(f)(2)(A)-(C)). For unadjudicated basins designated low- or very low-priority pursuant to SGMA, the WSA must also now describe the basin(s), but the preexisting substantive content requirements for WSAs with respect to such basins otherwise remain the same.

The California Water Code Section 10912(a) requires preparation of a WSA if a proposed project meets any of the following criteria:

1) A proposed residential development of more than 500 dwelling units;
2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space;
3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space;
4) A proposed hotel or motel, or both, having more than 500 rooms;
5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area;
6) A mixed-use project that includes one or more of the projects defined above; or
7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.

The Project does not include any residential development, will not employ more than 1,000 persons, does not include any structures with more than 500,000 square feet of floor space, and does not include any hotel or motel structure. Given that the Project involves mining and exceeds the size threshold for industrial projects under criteria, it constitutes a "project" within the meaning of Water Code § 10912(a)(5), and thus requires preparation of a WSA.

As applied under the CEQA, this WSA provides the relevant information needed to determine the significance of the environmental effects related to water resources. More specifically, when considering the Project's potential impact to groundwater, the following criteria are of particular relevance:

1) As planned, is there sufficient supply available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?
2) Would the Project have an adverse effect on existing uses of groundwater, such as nearby supply

wells?

3) If implemented, would the Project substantially deplete groundwater supplies or interfere with recharge such that sustainable groundwater management of a basin would be negatively impacted?

4) Would the Project be in conflict with or impede the implementation of a water quality control plan or sustainable groundwater management plan?

To address each of these criteria, the discussion that follows provides the technical background and basis for evaluating the Project's potential impacts with respect to groundwater resources.

## 3.0 EXISTING SETTING

### 3.1 Physiography

The Gem Hill site is located with the Western Mojave Desert region of California. More specifically, it is situated at the western end of the Rosamond Hills, which occur as a series of generally low-relief hills and buttes in Antelope Valley, California. Part of the Mojave Desert, the Antelope Valley is a closed basin characterized by isolated mountains and hills within a broad alluvial valleys. The site topography exhibits hills sloping from the northwest towards the southeast. Based on Google Earth™ imagery, elevations at the site range from approximately 2,880- to 2,660-feet above mean sea level (amsl).

### 3.2 Climate

The climate is semiarid and characterized by warm, dry summers and mild, cool winters. The mean daily temperatures range from 33°F in the winter to 98°F in the summer (Western Regional Climate Center, 2020). Native flora in the Region is dominated by sparse, drought-resistant vegetation that can tolerate both extreme heat and cold weather. Average monthly precipitation in the region ranges from 0.03 inches in June to 1.3 inches in February. The total annual average rainfall is 5.9 inches, with 70 percent of precipitation occurring between December and March and little to no rainfall in the summer months (California Irrigation Management Information System (CIMIS)). The Fremont Valley area has experienced wet-dry cycles with a prolonged drought period from 1945 to 1964, a prolonged wet period from 1976 to 1984, and a drought period from 2006 to the present (IRWMP, 2019).

Rates of evapotranspiration tend to be greatest in the summer, with the average maximum evapotranspiration (ETo) exceeding 9 inches annually (IRWMP, 2019). For comparison, monthly temperature, rainfall and total evapotranspiration are shown in Figure 3. In comparing these data, for the Project site most rainfall and thus the potential for recharge would be expected during winter and spring, when evapotranspiration tends be lower. This analysis, however, conservatively assumes there will be no recharge of the local basalt aquifer.

### 3.3 Regional Geology

In the western section of the Mojave Desert region, Cenozoic crystalline rocks, Tertiary sedimentary and volcanic rocks, Quaternary basalts and alluvial deposits are predominate (Dibblee, 1967). Moreover, the area is defined by a number of regionally extensive faults. Of the mapped faults, two major systems form the physiographic wedge that defines the western and northern boundaries of the Antelope Valley: the Garlock fault zone and San Andreas fault zone. The Garlock fault zone north of the Project site separates the Tehachapi Mountains from the Western Mojave basin. The San Andreas fault zone forms the

boundary between the San Gabriel Mountains and the southern Mojave basin to south.

Tertiary volcanic, pyroclastic and sedimentary rocks that are cross-cut by various east-west and northwest striking faults are exposed throughout the Gem Hill Project area. The Project site area contains a succession of tuffs, lahar deposits with interstratified basalts and other volcanic and sedimentary rocks, including intrusive dacites, pyroclastics ash deposits, breccia and conglomerate (Van Buer, 2019). These rocks are interpreted to be offset by normal, reverse and possible thrust faults, several of which may have been reactivated as a result of transpressional extension (Van Buer, 2019).

### 3.4 Area Hydrogeology and Groundwater Basins

In the Antelope Valley, two principally alluvial groundwater basins are recognized: The Antelope Valley Groundwater Basin and Fremont Valley Groundwater Basin. Both basins have adopted groundwater management plans. The Project site lies entirely outside of the Fremont Basin and the Antelope Valley Basin, except for a small 1.4-acre triangular area along the southern Project boundary (refer to Figure 2), which lies south of an extensive northeast trending fault. This small area of the Project site within the Antelope Valley Basin will not be the site of mineral resource recovery as part of the Project, nor will any groundwater supply wells be drilled in this area.

### 3.5 Groundwater Management Framework

The Project site is situated within the jurisdictional boundaries of the Lahontan Region Basin Plan, which establishes surface and groundwater standards for the region according to designated beneficial uses. The Lahontan Basin Plan summarizes applicable provisions of separate State Board and Regional Board planning and policy documents, and of water quality management plans adopted by other federal, state, and regional agencies. With the Gem Hill Project, dust control and periodic irrigation as needed to achieve reclamation objectives are the two intended uses of groundwater. These uses are consistent with the policies set forth in the Basin Plan. Therefore, implementation of the Project would not create a conflict with the Lahontan Region Basin Plan.

As previously discussed, the Project lies outside of an adopted groundwater management plan, except for an approximately 1.4-acre triangular section of the Antelope Valley Groundwater Basin that extends onto the Project at the southern edge. The proposed location for the groundwater supply well that would serve the Project is nearly 1,000 feet south of the southern boundary of the Freemont Valley Groundwater Basin, which is designated as a low priority basin under the SGMA. Therefore, the Project would not have an impact to an adopted groundwater management plan.

## 4.0 SITE-SPECIFIC GROUNDWATER CONDITIONS

In order to assess groundwater conditions in the Project vicinity, the California Statewide Groundwater Elevation Monitoring (CASGEM) was accessed to review publicly available groundwater well records. Of the records identified, there are two domestic water supply wells approximately 3,000 feet from the proposed well location for the Project. Both of these wells are associated with residences east of Mojave-Tropico Road, near the intersection with Gem Hill Road. There is also a residence approximately 1,800 feet to the east of the proposed Project well, which is along Mojave-Tropico Road; however, no documentation was found in CASGEM indicating whether there is a water supply well at this location.

The driller's logs for the two nearest groundwater wells discussed above indicate that groundwater was

encountered in different geologic units during installation of the wells; one in fractured limestone and the second in decomposed granite. Although these two well locations are only about 1,000 feet apart, and given that the subsurface geologic framework is characterized by dipping strata and faulting, the difference in hydrogeology between these two locations is not unexpected. According to the well records, static groundwater at the time these wells were installed was reported to be 190 feet and 200 feet bgs, with airlift tests results of 5 and 40 gpm, respectively.

As respects the residence approximately 1,800 feet to the east of the proposed Project well, given the faulting in the vicinity of the Project site, any well at this residence would be expected to withdraw water from an entirely different hydrogeologic unit that the constrained basalt aquifer. Even if located in the same aquifer, however, the average annual residential consumption of water is approximately 0.41 acre-feet per year (Aquacraft Water Engineering and Management, 2011). This equates to approximately 12.3 acre-feet of use over the 30-year life of the Project.

Although the CASGEM review did not reveal any well records in association with the Project site, geologic mapping information for the area and lithologic logs associated with onsite exploratory drilling conducted by CalPortland indicate the site overlies a fractured/faulted aquifer, which is distinct and excluded as part of the alluvial aquifer boundaries mapped for the Antelope Valley and Freemont Valley Groundwater Basins.

The exploratory boreholes are shown on Figure 2. Based on Sespe's review of lithologic logs compiled for the boreholes drilled at the Project site, groundwater beneath the site is encountered at varying depths within and along the top of a southwest dipping amygdaloidal basalt. The basalt aquifer is overlain by tuffaceous units and cross-cut by east-west, northwest, and north-east rending fault segments.

In terms of hydraulic characteristics, volcanic-rocks, such as basalt, can exhibit a wide range of aquifer storage and transmission properties that affect the movement of ground water. These include the extent of vesicules formed as well as the extent and interconnection of jointing, which contribute to porosity. Laboratory studies of the hydrologic and physical properties of various rock types have measured porosity values for basalt ranging from 3% to 35%, with an average of 17% (Morris & Johnson, 1967); however, effective porosity would be expected to be lower given the potential for weathering (clay minerals in vesicules and along joint planes), secondary mineralization, and the overall nature in which voids are interconnected.

The basalt described from the Project exploratory drilling program is noted as having some secondary mineralization within amygdules, so while the basalt may be vesicular, the porosity and permeability would be reduced through minerals filling the cavities. Also, while some jointing can be expected, the lithologic logs do not describe the extent and magnitude of jointing or fracturing.

Based on the lithologic log for borehole R-16, which is located south of the proposed water supply well for the Project, groundwater was observed at approximately 335 feet bgs. This depth is roughly coincident with the top of the basalt unit at this location. Initial airlift tests performed during the exploratory drilling indicates that the basalt aquifer underneath the Project site is capable of producing initial yields of 45 gpm or greater, varying with location and depth.

Given the proposed Project water supply well would draw groundwater from the basalt aquifer, which is an entirely different hydrogeologic unit than the source for the residential wells to the east, and the

nominal reach that would result at the planned 15 gpm pumping rate, measurable well interference resulting from the Project is not expected. Moreover, the effect of pumping from the basalt aquifer is likely to be constrained because of faulting in the Project area.

Considering the constrained nature of the basalt aquifer and the location of the Project water supply well in relation to the fault lineament orientations, the effect pf pumping on the aquifer is expected to be spatially and directionally limited (Moharir, Pande, & Patil, 2017). Consequently, when the nominal pumping rate (approximately 15 gpm) planned to meet the Project demand is taken into account, short- or long-term pumping of groundwater at the proposed Project well location is not anticipated to create hydraulic interference within the Antelope Valley and Freemont Valley Groundwater Basins; and particularly since the well location is separated from the basins by faults that typically act as barriers to groundwater flow (Arcadis, 2019) (Department of Water Resources, 2003).

## 5.0 GROUNDWATER RIGHTS

As defined earlier, the source of water for the Gem Hill Project will come from the basalt aquifer underneath the site. This groundwater is not mapped as part of any regional groundwater basin, subject to any past or pending adjudicatory action, nor part of a prior appropriation dispute. A review of title records provided by CalPortland indicates that the Company owns the project property in fee. Additionally, no covenants or reservations of water were identified in the records reviewed. Therefore, it is our understanding that CalPortland has the legal right to draw upon and use the groundwater underlying its property, subject to permitting the water supply well by the County of Kern.

## 6.0 SOURCE AND NATURE OF WATER SUPPLY

The Gem Hill Project site and immediate vicinity are situated in an area of the Mojave Desert region characterized by bedrock outcrops, exposed above the valley floor. At the Project site, there are no perennial streams that would provide a surface water supply. Nor is there enough seasonal surface water flow within the drainages to provide enough water that could be captured for an assured onsite water supply. Therefore, for this Project water would need to either be imported to the site or sourced from the underlying aquifer. Since the Project will only require water for dust control and general support to the mining operation, the Project is designed to utilize groundwater to serve the water needs of the Project.

## 7.0 WATER DEMAND

The Gem Hill Project will require up to 18 acre-feet of water annually. This annual demand equates to 540 acre-feet over the 30-year life of the Project. This Project demand ties directly to the planned consumptive uses, which is principally for dust control during mining and transport of the harvested pozzolan material, and for periodic irrigation as needed to support revegetation as part of site reclamation. Accordingly, CalPortland plans to install and construct a single water supply well at the location (shown in Figure 2).

## 8.0 SUFFICIENCY ANALYSIS

In accordance with Govt. Code § 66473.7(a)(2), a sufficient water supply for a project constitutes a total water supply of water available during normal, single dry and multiple dry years within a 20-year projected demand period. As previously discussed, the groundwater source for the Project's water supply well would be located in an area where the underlying aquifer is interpreted to be constrained hydrogeologically by bounding faults. Consequently, the aquifer is considered to be hydraulically isolated locally and therefore is assumed to have a finite storage capacity.

For this sufficiency analysis, Sespe evaluated the entire 30-year life of the Project. The annual water demand of 18 acre-feet was used to compare with the estimated available supply, which is discussed more fully below.

The groundwater source for the Project occurs in an area that is outside of adopted basin management plans. Additionally, based on a review of publicly available well records in the immediate vicinity of the water supply well location, aquifer parameters are unknown for the basin area defined for the Project. Therefore, in order the conduct the sufficiency analysis, Sespe used the following conceptual hydrogeologic model to assess the available supply of water for the Project, which is based on site-specific geologic mapping information, CalPortland lithologic logs, and published geologic reports for the area:

1. The underlying Tertiary basalt is the principal aquifer, which is confined by the overlying volcanic tuffs.
2. Total saturated thickness was constrained to the interval from top of first groundwater observed, based on CalPortland's exploratory drilling program for a borehole south of the proposed water supply well location, and the anticipated total depth of the well.
3. The local aquifer area serving the Project is defined by the fault segments (shown on Figure 2) and to the east the extent of bedrock observed in outcrop.
4. The aquifer is considered to be vesicular basalt with some secondary mineral filling and nominal fracturing.
5. Inflow of groundwater in the basalt aquifer is principally a function a preferential hydraulic communication between the fracture flow system below the site and the much larger alluvial basin to the north that is part of the Freemont Valley Groundwater Basin.
6. Recharge from direct precipitation would be insignificant given the limited aerial extent of the local aquifer, with replenishment occurring principally via inflow.

With the conceptual model described, the sufficiency of the water supply was evaluated by first approximating the amount of water available in the local aquifer for pumping using the following equation: $V = A*ST*SY$, where V is the gross volume of water in gallons available for pumping, A is the area in square feet of the aquifer, ST is the saturated thickness and SY is specific yield (Buddemeier & Schloss, 2000). Next, the Project water demand and amount of available groundwater in the local aquifer was assessed in relation to the total regional aquifer storage capacity to the north, assuming some degree of hydraulic communication between the underlying basalt and alluvial basin.

Since specific yield and effective porosity can be regarded as generally equivalent, here Sespe reviewed available literature addressing the effective porosity in basalt to assign a specific yield value to calculate

the gross aquifer volume using the above equation. In reviewing effective porosity for this analysis, a variety of literature and online resources were consulted, including data from AQTESOLV™. While total porosity measured for basalt can vary in the range of 3% to 35% (Morris & Johnson, 1967) (Heath, 1983), the effective porosity may be much lower depending on the extent of interconnected void space associated with vesicles, joints and/or fractures. Based on two studies that examined the effective porosity of basalt, values of 2.5% and 4.0% were reported (Heath, 1983) (Sandia National Laboratories, 1982). Given these reported values, Sespe conservatively selected 3.0% as the equivalent specific yield for the aquifer volume calculation.

For the purposes of this evaluation, the total surface area of the local aquifer was defined by the fault segments and generally the extent of the bedrock outcrop to the east was used. When taking into account the area contained within the faults and extending to the eastern extent of outcrop, the area measured for the local aquifer is approximately 4.6 million square feet. This approach estimates the storage capacity solely of the basalt aquifer as previously noted in order to assess the Project impact.

The saturated thickness was determined by projecting the approximate top of the groundwater table at the planned water well location by using the depth to first water encountered in the nearby exploratory boreholes, and assuming a continuous saturated interval to the water supply well's planned total depth of 640-feet bgs. The top of groundwater was taken to be 225-feet bgs, which yields a total saturated thickness of 415-feet. Again, limiting the saturated internal to just the depth of the well is overly conservative, as it is reasonable to infer that groundwater occurs at greater depth intervals. For simplicity, we assume that the hydraulic head is equivalent to the saturated thickness.

Using the values presented above, the total estimated storage capacity of the local aquifer is 1,315 acre-feet.

For the Project, a maximum annual demand of 18 acre-feet of water is needed. Over the life of the Project, the total water demand is approximately 540 acre-feet. With the conservative premise that no replenishment of the local basalt aquifer occurs, the Project's estimate demand is 41% of the total capacity. Accordingly, there is sufficient water supply over the duration of the Project.

Further, if it were assumed that the residence located 1,800-feet to the east of the groundwater supply well were in the same aquifer, such residential demand is estimated to be 0.41 acre-feet per year (Aquacraft Water Engineering and Management, 2011). Added to the Project's anticipated water needs, and conservatively assuming no replenishment, total estimated demand over the life of the Project including this residential use is 42% of the total capacity. Again, conservatively including the residential use immediately east of the groundwater well demonstrates there is sufficient water supply over the duration of the Project. Therefore, the Project would have no significant impact on the neighboring water use.

This WSA also considers the sufficiency and certainty of the proposed groundwater supply under normal, single dry and multiple dry years. Typically, in cases where there is a pre-existing water supply, there are available historical and/or planned water usage data to support an evaluation of water sufficiency for normal, single dry and multiple dry years. In this case the Project includes developing a new private onsite water supply well, which will source groundwater from an isolated aquifer that is not part of a formally recognized groundwater basin. Consequently, this WSA assesses the Project's potential future effect to the water supply over a 20-year period by comparing the demand against the available water supply over

a 20-year projection. Projected water demand is expected to increase 60% over the next 20 years, and the projected water supply from groundwater is expected to increase to account for this higher demand (IRWMP, 2019). Thus, while the amount of available groundwater is expected to decrease over the projected 20-year period as this source is increasingly relied upon, the Project's projected nominal water demand would not adversely impact the water supply (IRWMP, 2019). Moreover, the supply is sufficient to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years.

## 9.0 CONCLUSIONS

Sespe has performed this WSA in support of Kern County's environmental review of the CalPortland Gem Hill Project. The scope of this assessment provides the pertinent background and analysis required to prepare a CEQA impact determination with respect to the Project's effects on the groundwater planned as a water supply source. Based on the analysis included in this WSA, Sespe provides the following conclusions:

1. The Project will require 18 acre-feet of water annually. The source of water is a local basalt aquifer that underlies the Project site. This aquifer is spatially constrained, as the basalt and the overlying tuffaceous rocks are cross-cut by faults. Based on an exploratory drilling program completed by CalPortland, groundwater was encountered at 335 feet bgs at a location south of the proposed water supply well. This depth is roughly coincident with the top of the basalt unit. Initial airlift tests performed during the exploratory drilling indicates the basalt aquifer underneath the Project site is capable of producing initial yields of 45 gpm or greater, varying with location and depth.
2. The Project lies outside of an adopted groundwater management plan, except for an approximately 1.4-acre triangular section of the Antelope Valley Groundwater Basin that extends onto the Project at the southern edge. And, the proposed location for the groundwater supply well that would serve the Project is nearly 1,000-feet south of the southern boundary of the Freemont Valley Groundwater Basin, designated a low priority basin under the Sustainable Groundwater Management Act (SGMA). Therefore, the Project would not have an effect on an adopted groundwater management plan.
3. The total estimated storage capacity of the local aquifer is 1,315 acre-feet. For the life of the Project, the total water demand is approximately 540 acre-feet. Conservatively assuming that there is no recharge to the local basalt aquifer, Project demand is 41% of the total capacity. Accordingly, there is sufficient water supply over the duration of the Project.
4. Based on the sufficiency analysis prepared for the Project, the water supply is sufficient to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years. Consequently, the planned groundwater supply source is anticipated to meet the projected water demand over the life of the Project.

## 10.0 REFERENCES

Aquacraft Water Engineering and Management. (2011). *California Single Family Water Efficiency Study.* Aquacraft Water Engineering and Management.

Arcadis. (2019). *Draft Final Hydrogeology Report (2019 Update).* Kern County, California: Arcadis.

Bader, J. S. (1969). *Ground-Water Data as of 1967 South Lahontan Subregion California.* Water Resources Division. U.S. Geologic Survey.

Bloyd, R. M. (1967). *Water Resources of the Antelope Valley-East Kern Water Agency Area, California.* Washington DC: U.S. Geological Survey.

Buddemeier, R. W., & Schloss, J. A. (2000). *An Atlas of the Kansas High Plains Aquifer.* Kansas Geologic Survey.

California Department of Water Resources. (2001, September). *Groundwater Level Data*. Retrieved from Water Data Library (WDL): https://wdl.water.ca.gov/Home.aspx

California Irrigation Management Information System (CIMIS). (n.d.). *California Department of Water Resources. Data for Palmdale No. 197 Station.* California Irrigation Management Information System (CIMIS). Retrieved from http://wwwcimis.water.ca.gov/cimis/data.jsp

Carlson, C. S., Leighton, D. A., Phillips, S. P., & Metzger, L. F. (1998). *Regional Water Table (1996) and Water-Table Changes in the Antelope Valley Ground-Water Basin, California.* Washington DC: U.S. Geological Survey.

City of California. N.D.a. (n.d.). City History and City Facts. *City History and City Facts*. City of California.

Department of Water Resources. (1964). *Ground Water Occurence and Quality Lahontan Region.* Department of Water Resources.

Department of Water Resources. (1964). *Groundwater Occurrence and Quality, Lahontan Region.* Sacramento, CA: Department of Water Resources.

Department of Water Resources. (1969). *Water Wells and Springs in the Fremont Valley Area, Kern County, California.* Sacramento, CA: Department of Water Resources.

Department of Water Resources. (1975). *Bulletin 118: California's Groundwater.* Sacramento, CA: Department of Water Resources.

Department of Water Resources. (2003). *California's Groundwater Bulletin 118, Update, October.* Sacramento, CA: Department of Water Resources.

Department of Water Resources. (2003). *Guidebook for Implementation of Senate Bill 1610 and Senate Bill 221 of 2001 to Assist Water Suppliers, Cities, and Counties in Integrating Water and Land Use Planning.* Sacramento, CA: Department of Water Resources. Retrieved from https://digitalcommons.law.ggu.edu/caldocs_agencies/95

Department of Water Resources. (2004). *California's Groundwater: Bulletin 118 (Update 2003).* Sacramento, CA: Department of Water Resources. Retrieved March 2007, from http://www.groundwater.water.ca.gov/bulletin118/

Department of Water Resources. (2015). *California's Groundwater Update 2013.* Sacramento, CA: State of California Natural Resources Agency. Retrieved from https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/California-Groundwater-Update-2013/California-Groundwater-Update-2013---Statewide.pdf

Dibblee, T. W. (1963). *Geology of the Willow Springs and Rosamond quadrangles, California.* Washington DC: USGS.

Dibblee, T. W. (1967). *Area Geology of the Western Mojave Desert.* Geologic Survey.

Durbin, T. J. (1978). *Calibration of a Mathematical Model of the Antelope Valley Ground-Water Basin, California.* Washington DC: U.S. Geological Survey.

Heath, R. C. (1983). *Basic Ground-Water Hydrology.* Washington, DC: U.S. Geological Survey.

Integrated Regional Water Management Region. (2019). *Fremont Basin Integrated Regional Water Management Plan.* California Department of Water Resources. Sacramento, CA: Regional Water Management Group of the Integrated Regional Water Management Region. Retrieved from https://www.californiacity-ca.gov/CC/images/_Fremont-Basin-IRWMP_FINAL_2019-02-22.pdf

Jennings, C. W., & Strand, R. G. (1969). *Geologic Map of California - Los Angeles Sheet.* Department of Conservation. Washington, DC: U.S. Geologic Survey. Retrieved from ftp://ftp.consrv.ca.gov/pub/dmg/pubs/gam/GAM_008_Los_Angeles/GAM_008_Map_1969.pdf

Londquist, C. J., Rewis, D. L., Galloway, D. L., & McCaffrey, W. F. (1993). *Hydrogeology and Land Subsidence, Edwards Air Force Base, Antelope Valley, California, January 1989-December 1991.* Washington, DC: U.S. Geological Survey.

Moharir, K., Pande, C., & Patil, S. (2017). *Inverse Modeling of Aquifer Parameters in Basaltic Rock with the Help of Pumping Test Method Using MODFLOW Software.* Geosci Front Elsevier J.

Morris, D. A., & Johnson, A. I. (1967). *Summary of Hydrologic and Physical Properties of Rock and Soil Materials, as Analyzed by the Hydrologic Laboratory of the U.S. Geological Survey.* Washington DC: U.S. Geological Survey.

National Oceanic and Atmospheric Administration. (2018). *Randsburg Station ID USC00047253 (1937 to 2018).* Washington DC: National Centers for Environmental Information. Retrieved from https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USC00047253/detail

Planert, M., & Williams, J. S. (1995). *Ground Water Atlas of the United States: Segment 1, California, Nevada.* Washington, DC: U.S. Geological Survey.

Sandia National Laboratories. (1982). *Repository-Site Definition in Basalt: Pasco Basin, Washington.* Washington, DC: U.S. Nuclear Regulatory Commission.

Stetson Engineers Inc. (April 2009). *Evaluation of Groundwater Resources in California City.* Sacramento, CA: Stetson Engineers Inc. Retrieved from http://www.energy.ca.gov/sitingcases/beacon/documents/other/2010-03-04_California_City_Groundwater_Data_TN-55732.PDF

U.S. Geological Survey. (1969). *Water Wells and Springs in the Fremont Valley Area, Kern County, California.* U.S. Geological Survey.

U.S. Geological Survey. (1975). *California's Ground Water.* U.S. Geological Survey.

Van Buer, N. (2019). *Preliminary Geologic Map of the Eastern Rosamond Hills.* San Luis Obispo, CA: Department of Geological Sciences, Cal Poly Pomona.

Western Regional Climate Center. (2020). *Mojave Station No. 045756 (1904 to 2016)*. Retrieved from Western Regional Climate Center: https://wrcc.dri.edu/

# FIGURES


Project Site
Backus Rd
Gibbs Ave
Montiverde Rd
Sopp Rd
Champagne Ave
ROSAMOND HILLS
Dawn Rd
Beaudette Ave
Hidden Valley
Irone Ave
70th St W
58th St W
50th St W
Mojave Tropico Rd
40th St W
25th St W
Werner St
Howard St
30th St W
Prospect St
20th St W
Frontage Rd
Desert Highland Pkwy
2500 ft
14
N
0 0.5 1 2
Miles
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
California
Kern County
Pacific Ocean
Copyright:© 2013 National Geographic Society, i-cubed
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CalPortland
Gem Hill Vicinity Map
FIGURE NUMBER
1

## Legend

- Water Supply Well Location
- Exploratory Boreholes
- Faults
- Site Boundary
- Fremont Valley Groundwater Basin
- Antelope Valley Groundwater Basin

R15-220
R2-800
R19-670
R8-350
R16-500
R11-190
R17-280
R18-140
R13-300
R12-320
R5-300
R10-210
R6-300
R14-230
R1-290

Map Reference: Fault Traces from Van Buer, N., 2019, Preliminary Geologic Map of the Rosamond Hills. Antelope Valley and Fremont Valley Groundwater Basin boundaries from GIS Data Source dated 2003, Kern County Groundwater Sustainability Agency (GSA)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

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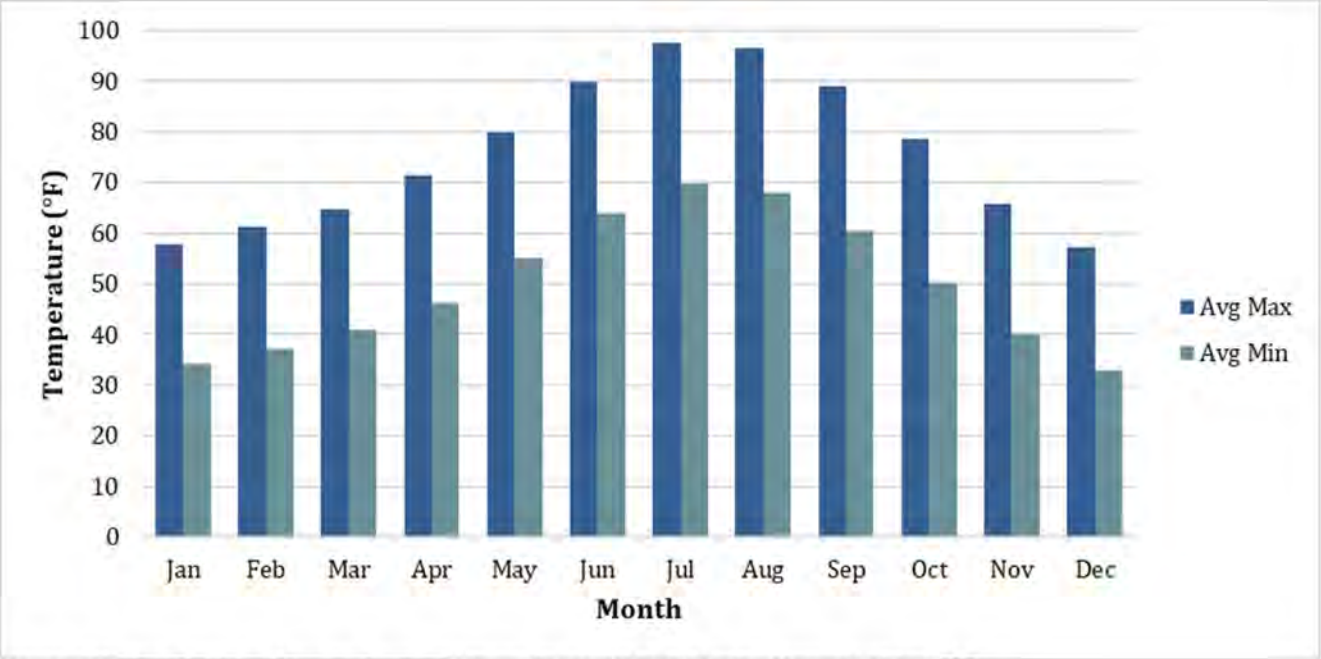
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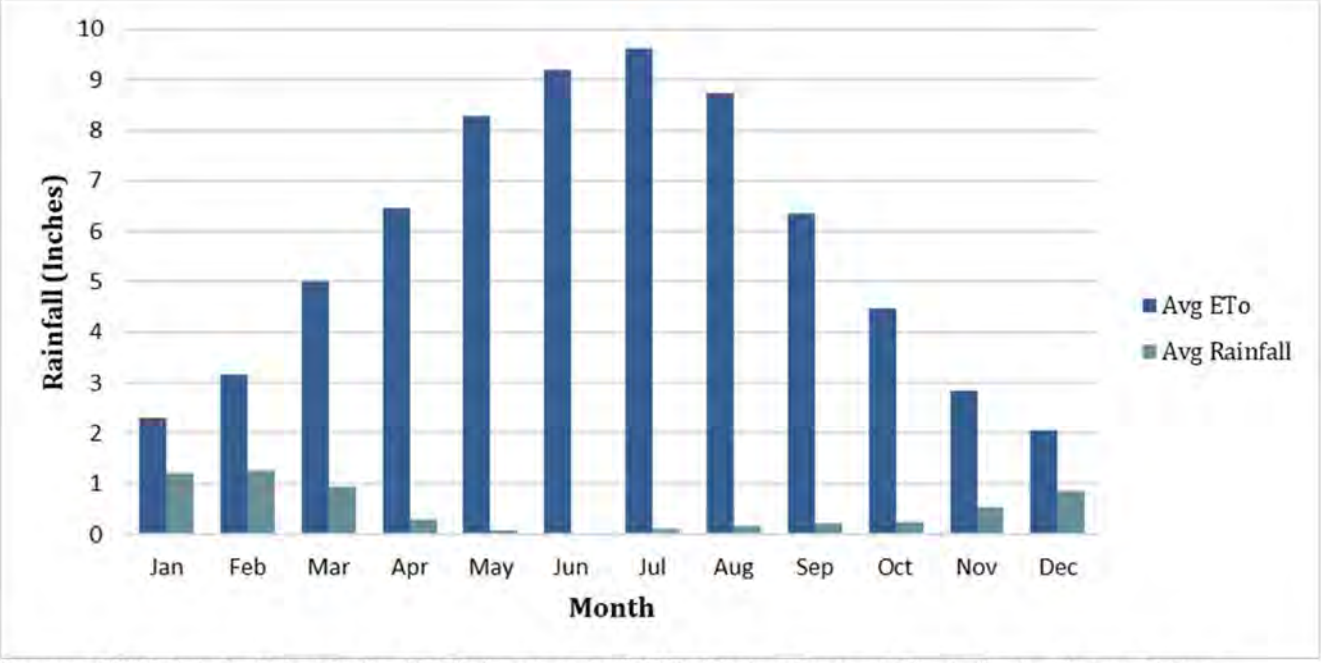
# Groundwater Basins and Collar Locations

FIGURE NUMBER

2




Source: Western Regional Climate Center, Mojave Station (045756) for the Years 1904 to 2016.




Sources: CIMIS Data for Palmdale No. 197 Station since April 2005; Western Regional Climate Center, Mojave Station (045756) for the Years 1904 to 2016.

GRAPHS FROM 2019 FREMONT BASIN INTEGRATED WATER MANAGEMENT PLAN (IRWMP)

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**AVERAGE MONTHLY TEMPERATURE, RAINFALL AND EVAPOTRANSPIRATION FOR FREMONT VALLEY GROUNDWATER BASIN**

FIGURE NUMBER
3

S:\CA26 – CalPortland Mojave\Rosamond Gem Hill\CAD\Figure 3.dwg Aug 05, 2020, 2:05pm GJC

Appendix I.3

# Technical Memorandum in Support of the Gem Hill Water Supply Assessment

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February 25, 2022

Desirea Haggard, P.E.
CalPortland Company
2025 E. Financial Way
Glendora, California 91741

**Subject: Technical Memorandum in Support of the Gem Hill Water Supply Assessment**

This technical memorandum is intended to supplement current hydrogeologic information in the Sespe Consulting, Inc. (Sespe) Water Supply Assessment report, dated November 5, 2020, prepared for the CalPortland Company Gem Hill Project. More specifically, the information herein addresses the peer review comments provided by Kern County, lead agency for the Project. Based on our review of these comments, we understand the County seeks additional detail regarding the following:

1) Groundwater quality data for the aquifer underlying the Project area and adjacent basins; of relevance here is the Freemont Valley Groundwater basin, which lies immediately to the north.
2) Information regarding the potential effects of groundwater pumping from the Project's proposed water supply well on the underlying basalt aquifer and adjoining groundwater basin.
3) Evaluation of the potential for the Project to substantially decrease groundwater supplies or interfere substantially with groundwater management such that the Project may impede sustainable management of the basin, in accordance with California Environmental Quality Act (CEQA) Appendix G Checklist criteria.
4) Background pertaining to the natural water quality of the underlying basalt aquifer, if available.
5) Identification of the nearest water systems and their location/proximity to the Project site.
6) Information regarding the meteorologic or hydrologic conditions that define normal, single dry year, and multiple dry year conditions.

**Hydrogeologic Setting and Groundwater Flow Conditions**

The Project site is underlain by an assemblage of predominantly volcanic rocks, which form the low-lying hills comprising Gem Hill. This volcanic assemblage includes a basalt unit that serves as the aquifer of interest for the Project. A geologic map for the Project area and cross-section showing the surface geologic units, including the basalt are provided as Figures 1 and 2, respectively. Additionally, the cross-section illustrates the relative depth to groundwater underneath the site. As shown in the cross-section, groundwater is anticipated to be at approximately 2,385 feet above mean sea level (amsl), based on exploratory drilling data provided by CalPortland Company.

For background, the basalt aquifer identified as the groundwater source for the Gem Hill Project is not part of a recognized groundwater basin except for a small area to the south where the Antelope Valley Groundwater Basin crosses the Project boundary. Given its limited spatial extent and apparent lack of use as a water source, it is unlikely the basalt aquifer would be included in the future as part of a formally recognized groundwater basin. Moreover, the predominance of crystalline rock forming the low-lying hills of the Gem Hill area are not likely to produce substantial quantities of groundwater. The exclusion of these crystalline rock areas in development of groundwater basin maps is typical, as it is common for formally recognized basins, to focus on aquifers with high yield, such as alluvial basins like the Antelope Valley Basin, as well as the Freemont Valley Groundwater Basin immediately to the north of the Project site.

With regard to assessing the Project's potential impact to groundwater quality, one important aspect to highlight is the relationship between the basalt aquifer and the adjoining Freemont Valley Groundwater Basin (FVGB) to the north. As described in the WSA report (Sespe, 2020) and noted above, the Project site lies outside of any adopted groundwater basin management plan, except for an approximately 1.4-acre triangular section of the Antelope Valley Groundwater Basin that extends onto the southern edge of the site. Given the hydrologic setting and groundwater flow conditions, groundwater in the basalt aquifer is believed to be replenished primarily by inflow from the adjoining FVGB alluvial basin to the north.

As previously noted in the WSA (Sespe, 2020), while the basalt aquifer is distinct from the alluvial aquifer of the FVGB immediately to the north, some inflow is expected to occur given the hydraulic gradient to the north. From a regional context, groundwater information analyzed as part of the 2019 Integrated Regional Water Management Plan (IRWMP) interprets groundwater flow in the southern part of the FVGB as moving generally southeasterly. Moreover, in the area directly north of the Project site, a hydrogeologic study prepared by Arcadis in 2019 for the Soledad Mountain Mine demonstrated that groundwater flows southerly, directly toward Gem Hill (Figure 3). Given this flow direction and the gradient interpreted from the regional flow contours prepared by Arcadis (2019), groundwater underneath the Project site where the proposed supply well would be located is expected to flow toward the Project site and thus facilitate inflow and control on groundwater in the underlying aquifer. Based on the Arcadis regional groundwater contour map, the hydraulic gradient immediately north of the Project site is estimated to range from 0.001 to 0.17 feet/mile depending on the variability in flow direction. Thus, replenishment via inflow is interpreted to be controlled by groundwater movement in the adjoining FVGB alluvial aquifer.

**Basalt Aquifer and Regional Groundwater Quality**

With replenishment of the basalt aquifer principally via inflow from the FVGB, water quality characteristics in groundwater underneath the Project site can be considered to be generally similar to the FVGB alluvial aquifer. Therefore, Sespe reviewed pertinent groundwater quality data for the FVGB to characterize water quality of the underlying basalt aquifer. The discussion that follows is taken from the California Department of Water Resources (DWR) Groundwater Bulletin 118 (2004).

Background water quality characteristics for the basalt aquifer are expected to be generally similar to groundwater in the southern part of the FVGB, given the hydrogeologic setting. The DWR Groundwater Bulletin 118 characterizes the basin as sodium bicarbonate in the southeast, and sodium bicarbonate or

calcium-sodium sulfate in the southwest. These areas are hydraulically most closely aligned with the basalt aquifer, and therefore, the groundwater underneath the Project site is considered to be consistent with a sodium bicarbonate to calcium-sodium sulfate water. DWR Groundwater Bulletin 118 also notes that total dissolved solids in the basin have an average content of 596 mg/L and a range of 398 to 1,400 mg/L, based on water quality data collected from public supply. With these background water quality signatures, use of the groundwater for dust control and mining support operations is not expected to cause of create adverse impacts to the aquifer or surface run-off that may occur during storm events.

**Effects of Pumping Groundwater**

As described in the WSA, the Project proposes to utilize the underlying basalt aquifer as a non-potable source of water in support of mining. Specifically, a groundwater well is proposed to be installed onsite, which would be pumped at approximately 15 gallons per minute. To evaluate the potential effects of pumping from the proposed supply well for the Project, Sespe analyzed the projected radius of influence under the design pumping levels to understand if the Project could interfere with any nearby groundwater wells. Publicly available records were reviewed using Groundwater Ambient Monitoring and Assessment (GAMA) and California Statewide Groundwater Elevation Monitoring (CASGEM) programs to identify the nearest well locations. Additionally, since it is possible that some private wells may not be recorded in these databases, for this analysis Sespe assumed the nearest residences to the Project's proposed water supply well location have existing groundwater wells that are used as the primary water source. Accordingly, the nearest residence is directly to the east along Mojave-Tropico Road, about 1,800 feet from the Project's proposed water supply well location. In order to determine if pumping of the Project well could have an impact on a hypothetical well at this location, Sespe used the State Water Resources Control Board drinking water source assessment worksheet to calculate the projected radius of influence under pumping conditions, given the proposed well design, pumping rate and formational attributes, such as effective porosity of the basalt. Following the State Water Resources Control Board's source assessment worksheet, for a 10-year pumping period, the capture zone is estimated to be 565 feet, as measured from the location of the water supply well. Based on the analysis performed, the Project's proposed groundwater well would not have an affect on the nearby residence, as the estimated capture zone is significantly less than the nearest potential well location.

**Groundwater Depletion and Sustainable Groundwater Management**

Because the proposed water supply well would draw groundwater from the basalt aquifer, which is not part of a recognized groundwater basin, nor subject to a groundwater management plan or the California Sustainable Groundwater Management Act (SGMA), therefore the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. To evaluate whether the Project could result in the substantial depletion of groundwater supply, Sespe compared the total life of Project water demand against the available aquifer capacity, assuming that all replenishment would come solely via inflow from the adjoining FVGB. Thus, in this scenario natural recharge from meteoric waters is fully discounted, which represents a conservative case. This assumption is substantiated by the fact that the local basalt aquifer is limited spatially, and consequently would receive only nominal recharge through infiltration of meteoric waters.

To evaluate whether the Project would substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that sustainable groundwater management of the basin could be adversely impacted, Sespe considered both the extent of the radius of influence under the proposed pumping conditions, as well the annual water demand in comparison with estimated recharge to the adjoining FVGB alluvial aquifer. To begin, since the basalt aquifer that would serve as the source of water for the Project is not a defined groundwater basin, nor subject to the SGMA, withdrawal of water from this source would have no impact regulatorily or statutorily with respect to sustainable groundwater management.

For our analysis, we conservatively assume all replenishment to the basalt aquifer comes from the FVGB to the north via inflow. As noted in the WSA, the annual water demand for the Project is 18 acre-feet. As part of the WSA, the capacity of the local basalt aquifer was estimated at 1,315 acre-feet, with replenishment assumed to come principally by inflow from the FVGB. To assess the Project's potential effect on groundwater supply, a review of available literature was performed to identify the yield of the adjoining FVGB. According to the IRWMP (2019), the safe yield has not yet been determined for the basin. Absent this information, Sespe compared the Project water demand with the FVGB aquifer capacity, as described in DWR (2004) Bulletin 118, which estimates the alluvial aquifer to have approximately 4.8 million acre-feet of storage. Therefore, under the conservative scenario (zero replenishment from infiltration of meteoric waters), over the 20-year life of the Project the groundwater withdrawal would amount to less than 0.008 percent. Therefore, it is Sespe opinion the proposed pumping of the basalt aquifer would not have any adverse effect on current or future anticipated groundwater demand and beneficial uses of the FVGB.

**Water Systems and Proximity to Site**

In the County's comments regarding the WSA, information pertaining to nearby waters system, specifically the identification of these systems and proximity to the Project site, was requested. Sespe reviewed public records pertaining to water systems in the Project vicinity and determined the nearest system to be the Rosamond Community Services District (RCSD). RCSD provides water and sewer service to over 16,000 residential and commercial customers for domestic, commercial, irrigation, and fire protection uses. Information provided in the State of California Drinking Water Watch currently lists three active wells in the RCSD, that supply water. The closest point from the Project to the RCSD is about 3,200 feet away, well outside of the estimated capture zone of the proposed water supply well. Consequently, the Project would not have any impact on the RCSD or its groundwater supply wells, since the proposed supply well would result in only an estimated 565 feet of capture under pumping conditions, given the assessment period used in the SCCRB's worksheet for estimating the capture zone, which was discussed previously.

**Meteorological/Hydrological Conditions Under Normal, Single Dry Year and Multiple Dry Year Conditions**

Included in the WAS is a determination whether the total projected water supply for normal, single-dry, and multiple-dry water years over the next 20 years will meet the projected water demand associated with the Project. Upon review of the sufficiency analysis, Kern County requested the WSA be supplemented to provide information pertaining to the meteorological or hydrological conditions that

define the normal, single dry year, and multiple dry year conditions. Accordingly, Sespe reviewed existing reports and data, including other water supply and hydrology studies for sites within the Project vicinity, to obtain background information that can establish the hydrological conditions under normal, single dry year and multiple dry year periods.

To further assess the hydrologic conditions that may control water supply reliability, Sespe obtained and reviewed climate data available through the Western Region Climate Center (WRCC) for the Lancaster, California meteorological station. This station is located about 12.0 miles from the Project site within the southern part of the Freemont Valley. It is situated at an elevation within the range of the Project site elevations, so the topographic controls on temperature, precipitation can be assumed to be generally similar. Therefore, Sespe considers the station setting to be sufficient to define the pertinent criteria that control the Project area hydrologic characteristics.

Average annual precipitation, and average maximum/minimum temperatures provided in the WRCC database are shown in Table 1 below.

**Table 1 – Climate Data Summary**

| Month | Average Precipitation (in) | Average Minimum Air Temperature (°F) | Average Maximum Air Temperature (°F) | Average Air Temperature (°F) |
|---|---|---|---|---|
| January | 1.56 | 30.8 | 57.9 | 44.7 |
| February | 1.77 | 34.6 | 60.4 | 47.8 |
| March | 1.18 | 39.4 | 65.8 | 52.9 |
| April | 0.37 | 44.6 | 71.7 | 58.8 |
| May | 0.11 | 53.3 | 80.6 | 67.0 |
| June | 0.04 | 61.0 | 89.8 | 76.1 |
| July | 0.09 | 66.6 | 96.5 | 82.1 |
| August | 0.11 | 64.2 | 95.9 | 80.6 |
| September | 0.18 | 57.0 | 89.9 | 73.8 |
| October | 0.39 | 46.2 | 78.6 | 62.6 |
| November | 0.47 | 35.3 | 66.0 | 51.0 |
| December | 1.11 | 29.1 | 57.4 | 43.5 |
| **Total:** | **7.38** | **46.8** | **75.9** | **61.7** |

Source: Western Regional Climate Center – NOAA Cooperative Stations: Lancaster WM J Fox Field, California (044749) (https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4749).

Period of Record: April 16, 1974 – June 9, 2016

These data indicate that the aquifer would receive some nominal amount of recharge through surface infiltration, primarily during the winter months when precipitation levels are highest and maximum surface temperatures are coldest. However, because the Project area is comprised primarily of hardrock volcanics, infiltration rates are expected to be low, and consequently a significant volume is expected to runoff. Thus, given the aerially small, isolated nature of the local Gem Hill watershed, and nominal

infiltration, replenishment to the basalt aquifer via recharge of meteoric water is considered insignificant, regardless of climatic variations.

In considering the hydrology under normal, single dry year and multiple dry year scenarios, and in particular the relationship between these conditions and water supply sufficiency, the difference in water demand for the Project for dry periods must be taken account, since the quantity of water used during a dry year or consecutive dry years would be greater. For this Project, variations in the quantity of groundwater sourced from the basalt aquifer would be, in part, dependent on the dust control requirements while mining occurs, along with the nature and timing of background precipitation. That is, during wet periods, the amount of water needed to control fugitive dust would be less. In contrast, dry years with precipitation below normal, the Project site would have fewer rainfall days, and consequently have additional demand for water. Based on the precipitation data from the Lancaster station, as well as relevant hydrologic data for the Mojave Mine located about 9.0 miles northwest of the Project site, the driest period of record for the area was from 1974 through 1977. A water supply study prepared by Mercy (1986) for the Mojave Mine site characterizes this period as a severe drought in terms of diminishing the local water supply. Given the Mojave Mine's proximity to Gem Hill, this drought period was used to determine the meteorological conditions, in particular the average annual precipitation, that defines the single dry year and multiple dry years. Accordingly, for the three consecutive years 1975, 1976 and 1977, precipitation of 0.24 inches equates to the single driest year and ranges from 0.24 to 0.80 inches for the three consecutive year dry period. Using the average annual precipitation, by comparison the normal year precipitation is 7.38 inches. Regardless of these hydrologic conditions, it is important to recall that because the basalt aquifer receives inflow from the FVGB, which has an aquifer capacity orders of magnitude greater (FVGB aquifer capacity of 4.8 million acre-feet verse 540 acre-feet over the life of the Project), even in the case of a single dry year or multiple dry year period, the local aquifer would continue to provide a sufficient supply of water, given the Project's nominal demand of 18 acre-feet annually. Even with a projected 60% increase in water demand over the next 20 years for the FVGB, and commensurate higher demand placed on the alluvial basin aquifer (IRWMP, 2019), the Project's water demand would not adversely impact the FVGB, even under the single or multiple dry year conditions as defined using historical precipitation records, where natural recharge would be significantly reduced.

We hope the information provided in this memorandum addresses the County's comments. Should you have any questions, please feel free to contact me at (619) 778-138.

Kind regards,



Brian G. Anderson, P.G.
**Sespe Consulting, Inc.**

**References**

Arcadis, 2019. Draft Final Hydrogeology Report, Soledad Mountain Mine, Kern County, California, 189 p.

DWR, 2004. Department of Water Resources, California's Groundwater Bulletin 118, South Lahontan Hydrologic Region, Fremont Valley Groundwater Basin, 4 p.

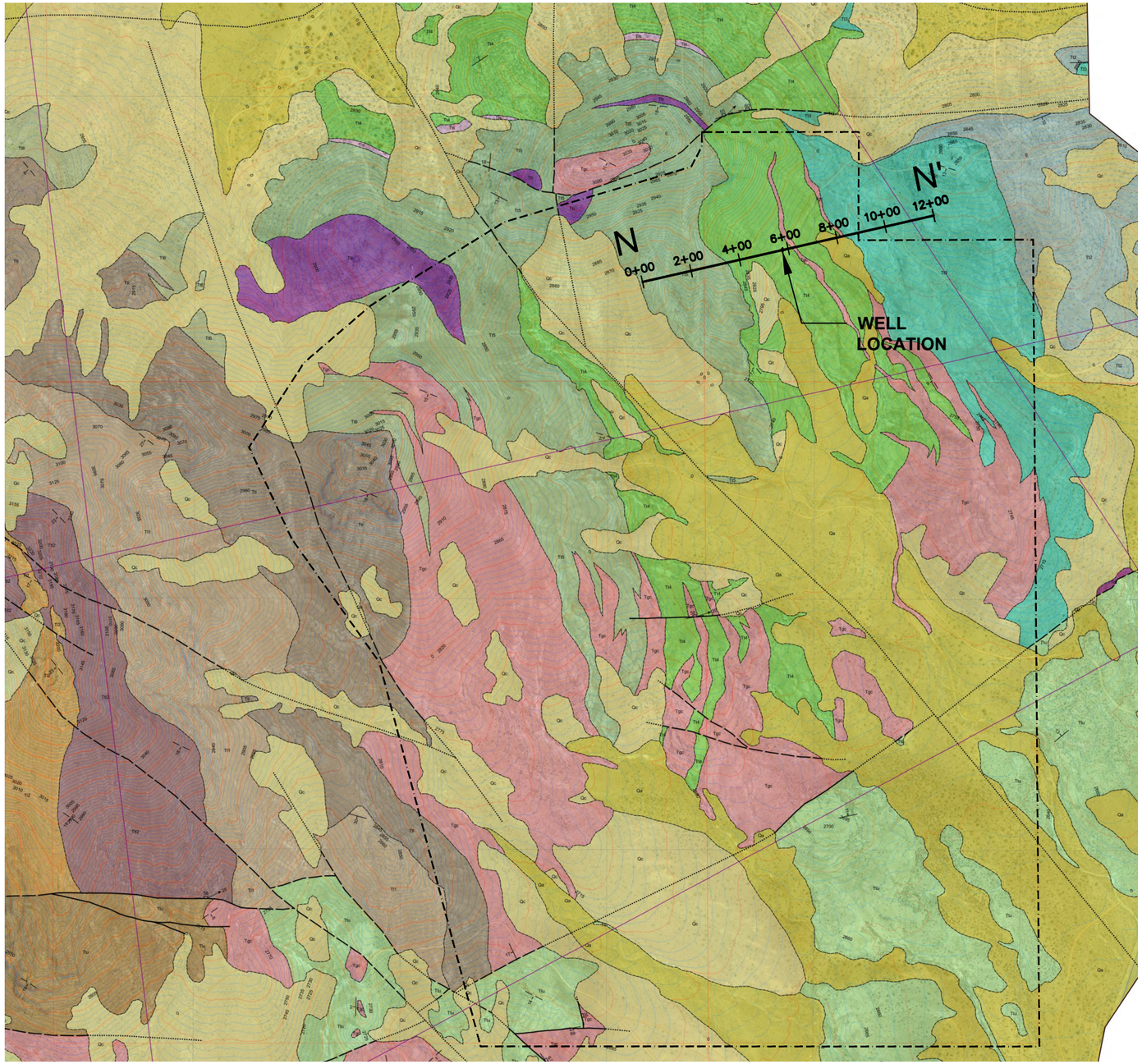
Freemont Valley Basin Groundwater Management Plan, 2018, prepared by the Regional Water Management Group of the Fremont Basin Integrated Regional Water Management Region, with Assistance from Woodard and Curran, 190 pages.

Freemont Valley Basin Salt and Nutrient Management Plan, 2018, prepared by the Regional Water Management Group of the Fremont Basin Integrated Regional Water Management Region, with Assistance from Woodard and Curran, 160 pages.

IRWMP, 2019. Freemont Basin Integrated Regional Water Management Plan, prepared by the Regional Water Management Group of the Fremont Basin Integrated Regional Water Management Region, with Assistance from Woodard and Curran, 198 pages, excluding appendices.

Mercy, L., 1986. Current Status and Future Adequacy of the Local Water Supply at the Mojave Cement Plant, 159 p.

Sespe Consulting, 2020. Water Supply Assessment, Gem Hill Project, prepared for the CalPortland Company, 18 p.




500 0 500 1000

## LEGEND

- Site Boundary
- Qa — Alluvium
- Qc — Colluvium -includes landslides and soil-mantled slopes where bedrock has been obscured
- Tdi — Rhyodacite intrusion
- Tlu
  - Tt8 — Tuff and reworked tuff
  - Tl2 — Resistant, light-weathering lahars
  - Ttl2 — Tuffs and red-weathering dacite-block lahars
  - Tl1 — Resistant, light-weathering lahars
  - Ttl — Tuffs and tuffaceous lahars
  - Tt6 — Interbedded tuffs and conglomerates
  - Tb — Amygdaloidal basalt with celadonite alteration
  - Tt5 — Coarse-ash +-lapilli tuff
  - Tls — Finely laminated lacustrine limestone. Pinches out to south.
  - Tt4 — Coarse-ash +-lapilli tuff
- Tgc — Granite-clast conglomerate (may contain dacite blocks also). Unit thickens southwards.
- Ttu
  - Tt3 — Pumice lithic lapilli coarse-ash tuff
  - Tt2 — Coarse-ash+-lapilli tuff, marked by dacite-block lahars near its base and top.
  - Td — Brecciated dacite flows
  - Tt1 — Fine-ash tuff
- Kg — Granitic basement

SOURCE: DEPARTMENT OF GEOLOGICAL SCIENCES, CAL POLY PONOMA.

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# GEOLOGIC CROSS-SECTION FOR THE GEM HILL PROJECT

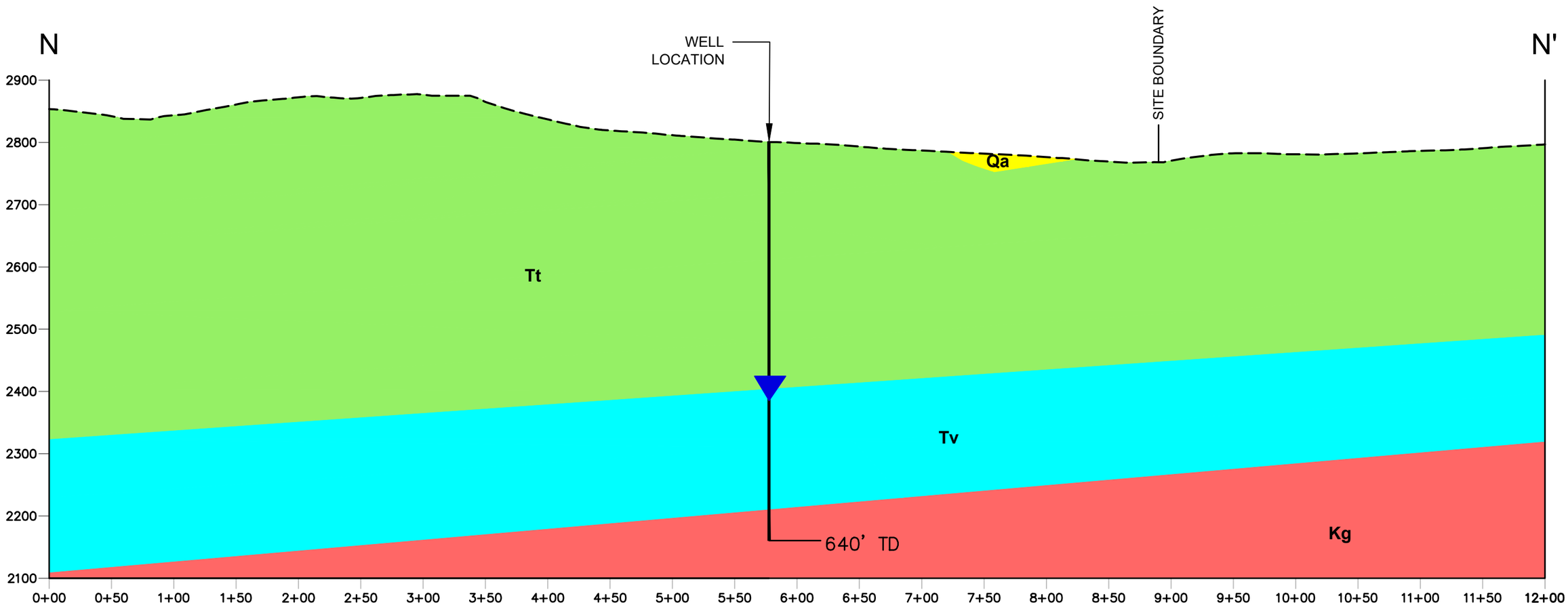
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FIGURE NUMBER 1

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**LEGEND**

| | | |
|---|---|---|
| | Qa | Quaternary alluvium |
| | Tt | Tertiary volcanic tuff & ash deposits, with some pumice & volcaniclastic deposits |
| | Tv | Tertiary volcanic & volcaniclastic rocks |
| | Kg | Granite basement |




NOT TO SCALE

SOURCE: Cross-section & stratigraphy modified based on [Van Buer, N. 2019]
Groundwater elevation based on reported depth in CalPortland Company exploratory borehole R-16

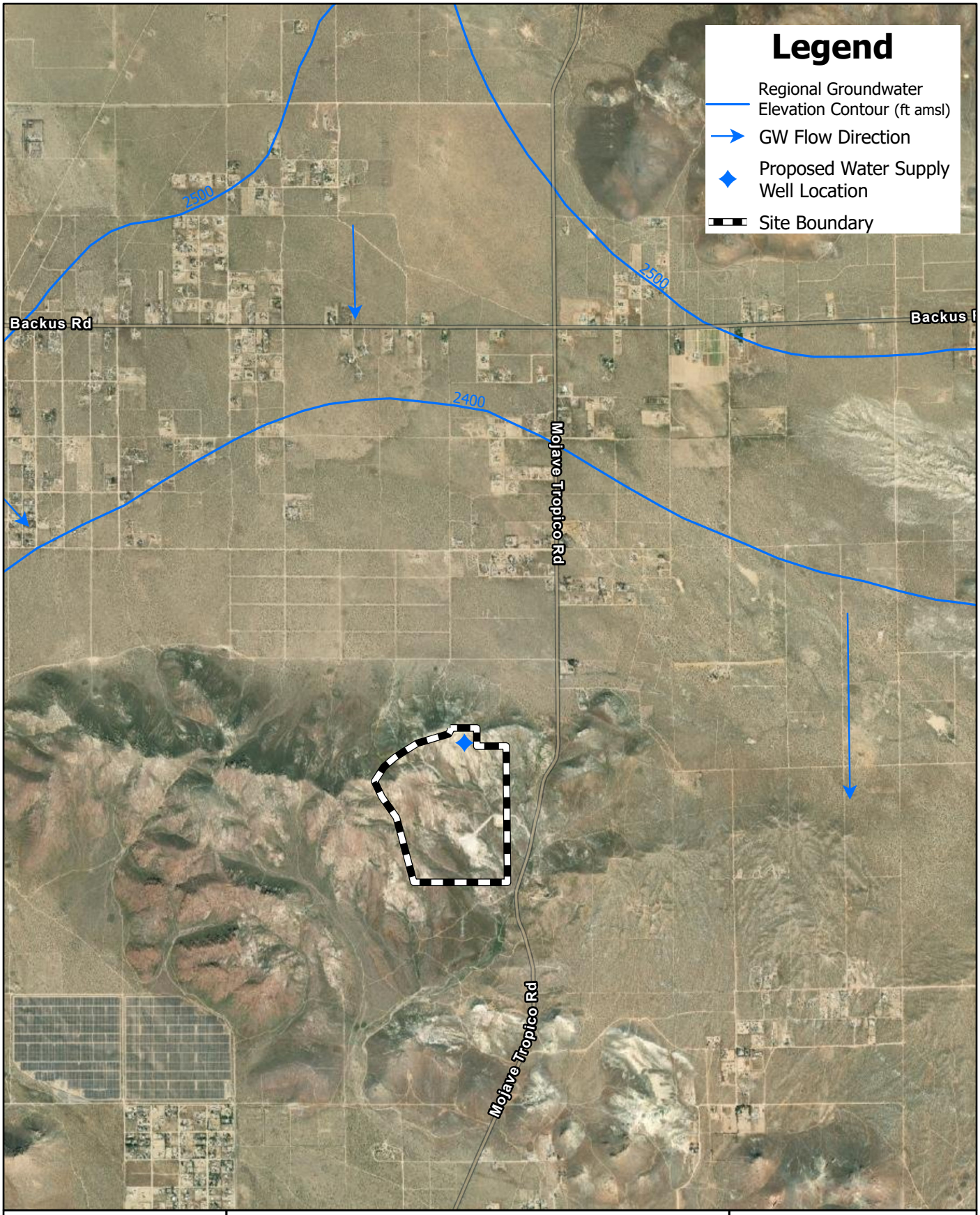

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**GEOLOGIC CROSS-SECTION FOR THE GEM HILL PROJECT**

SCALE: HORIZ. AS SHOWN VERT. AS SHOWN
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CHECKED BY: LB

FIGURE NUMBER 2


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N

0 0.07 0.15 Mi

0 0.17 0.35 Km

# Gem Hill Water Supply Well Location and Regional Groundwater Contours

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California State Parks, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA, Maxar

Figure No. 3

January, 2022

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

Author: LLB

Check by: BA

Appendix J

# Noise and Vibration Impact Analysis

# Gem Hill Quarry

## NOISE AND VIBRATION IMPACT ANALYSIS

### KERN COUNTY

PREPARED BY:

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JANUARY 13, 2022

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# LIST OF ABBREVIATED TERMS

| | |
|---|---|
| (1) | Reference |
| ANSI | American National Standards Institute |
| Calveno | California Vehicle Noise |
| CAL/OSHA | California Occupational Safety and Health Administration |
| CEQA | California Environmental Quality Act |
| CNEL | Community Noise Equivalent Level |
| dBA | A-weighted decibels |
| EPA | Environmental Protection Agency |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| INCE | Institute of Noise Control Engineering |
| ISEE | International Society of Explosives Engineers |
| $L_{eq}$ | Equivalent continuous (average) sound level |
| $L_{max}$ | Maximum level measured over the time interval |
| mph | Miles per hour |
| MSHA | Mine Safety and Health Administration |
| OSMRE | Office of Surface Mining Reclamation and Enforcement |
| PPV | Peak Particle Velocity |
| Project | Gem Hill Quarry |
| REMEL | Reference Energy Mean Emission Level |
| RMS | Root-mean-square |
| VdB | Vibration Decibels |

# EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Gem Hill Quarry ("Project"). The planned Project operation includes the quarry, two overburden stockpiles, stormwater basins for potential run-off, an equipment storage area, a water well, scale, and access roads on a proposed disturbance area of approximately 82 acres. Typical Project mining operations will consist of blasting about once per week, dozing, and stockpiling the tuff materials. This study provides an analysis of the potential Project-related operational noise and short-term blasting noise and vibration impacts. In addition, this study has been prepared to satisfy applicable Kern County noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

The results of this Noise and Vibration Impact Analysis are summarized below based on the significance criteria in Section 4 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

**TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS**

| Analysis | Report Section | Significance Findings | |
|---|---|---|---|
| | | Unmitigated | Mitigated |
| Off-Site Traffic Noise | 7 | *Less Than Significant* | - |
| Operational Noise | 9 | *Less Than Significant* | - |
| Blasting Noise | 10 | *Less Than Significant* | - |
| Blasting Vibration | | *Less Than Significant* | - |

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# 1 INTRODUCTION

This noise analysis and vibration impact analysis has been completed to determine the impacts associated with the development of the proposed Gem Hill Quarry ("Project"). This study briefly describes the proposed Project, provides information regarding noise and vibration fundamentals, sets out the regulatory setting, presents the study methods and procedures for the off-site haul truck trip pass-by traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related operational noise and short-term blasting noise and vibration impacts.

## 1.1 SITE LOCATION

The Gem Hill Quarry Project is located west of Mojave-Tropico Road and south of Gem Hill Avenue in Kern County as shown on Exhibit 1-A. The quarry is located within approximately 778 acres of land owned by the CalPortland Company. The Surface Mining and Reclamation Plan describes the planned operations for a period of 30 years from approval or through the year 2050. The Proposed Project is planned to be developed on a total disturbance area of approximately 82 acres.

## 1.2 PROJECT DESCRIPTION

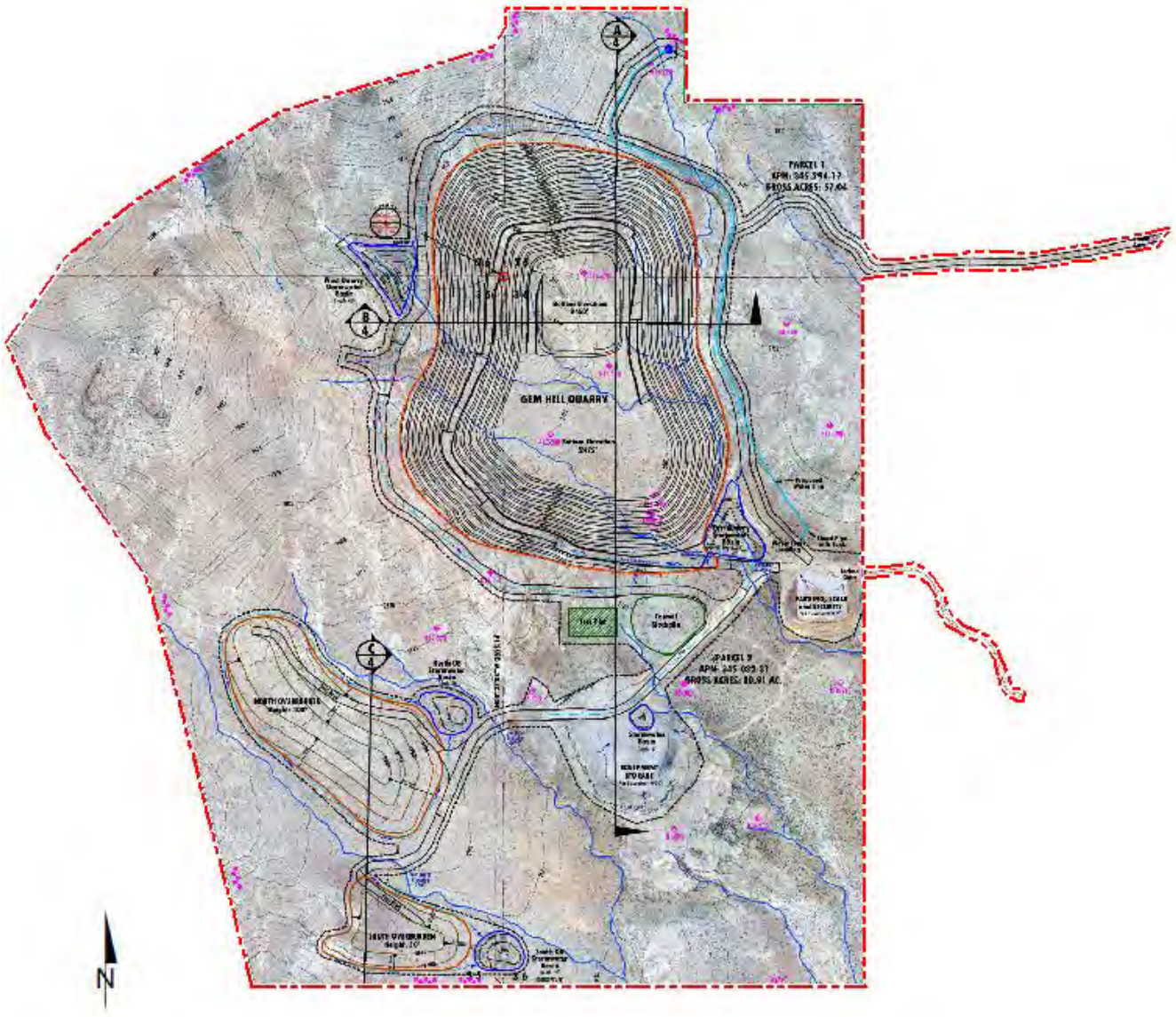
The Proposed Project has reserves of approximately 16 million tons (mt) and plans to extract up to 500,000 tons per year (tpy) of volcanic tuff or pozzolan, a type of volcanic material that can be utilized to replace a portion of clinker used in the manufacturing of portland cement as well as a portion of portland cement in ready-mix concrete. Pozzolan is defined as a cementitious material that increases the long-term strength and other material properties of portland cement and concrete and reduces the air emissions of carbon dioxide (CO2), a greenhouse gas (GHG) that contributes to global warming or climate change, in the production of cement.

The planned operation includes the quarry, two overburden stockpiles, stormwater basins for potential run-off, an equipment storage area, a water well, scale, and access roads on a proposed disturbance area of approximately 82 acres. Typical mining operations will consist of blasting about once per week, dozing, and stockpiling the tuff materials. The material will be loaded onto on-road trucks and hauled to existing cement production facilities. The material does not require crushing or processing, therefore, there will be no processing plant operations conducted on-site, limiting the production of dust and noise on-site. Typical hours of mining operations will be during daylight hours (generally 7:00 a.m. to 7:00 p.m. Monday through Saturday depending on the season), six days per week depending on market demand with the understanding that longer or alternative hours may be required due to operational constraints. An access road at Mojave Tropico Road will serve as the main ingress and egress for the Proposed Project. Operations will include approximately 10 full time employees. Security gates and signs will be located on the access road entrance at the property boundary.

## EXHIBIT 1-A: LOCATION MAP



## EXHIBIT 1-B: SITE PLAN



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# 2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

**EXHIBIT 2-A: TYPICAL NOISE LEVELS**

| COMMON OUTDOOR ACTIVITIES | COMMON INDOOR ACTIVITIES | A - WEIGHTED SOUND LEVEL dBA | SUBJECTIVE LOUDNESS | EFFECTS OF NOISE |
|---|---|---|---|---|
| THRESHOLD OF PAIN | | 140 | INTOLERABLE OR DEAFENING | HEARING LOSS |
| NEAR JET ENGINE | | 130 | | |
| | | 120 | | |
| JET FLY-OVER AT 300m (1000 ft) | ROCK BAND | 110 | | |
| LOUD AUTO HORN | | 100 | VERY NOISY | |
| GAS LAWN MOWER AT 1m (3 ft) | | 90 | | |
| DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph) | FOOD BLENDER AT 1m (3 ft) | 80 | | SPEECH INTERFERENCE |
| NOISY URBAN AREA, DAYTIME | VACUUM CLEANER AT 3m (10 ft) | 70 | LOUD | |
| HEAVY TRAFFIC AT 90m (300 ft) | NORMAL SPEECH AT 1m (3 ft) | 60 | | |
| QUIET URBAN DAYTIME | LARGE BUSINESS OFFICE | 50 | MODERATE | SLEEP DISTURBANCE |
| QUIET URBAN NIGHTTIME | THEATER, LARGE CONFERENCE ROOM (BACKGROUND) | 40 | | |
| QUIET SUBURBAN NIGHTTIME | LIBRARY | 30 | FAINT | NO EFFECT |
| QUIET RURAL NIGHTTIME | BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND) | 20 | | |
| | BROADCAST/RECORDING STUDIO | 10 | VERY FAINT | |
| LOWEST THRESHOLD OF HUMAN HEARING | LOWEST THRESHOLD OF HUMAN HEARING | 0 | | |

*Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.*

## 2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 1,000 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

## 2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used metric is the equivalent level ($L_{eq}$). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level ($L_{eq}$) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA $L_{eq}$ sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA $L_{eq}$ sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The Kern County relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

## 2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

### 2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

### 2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

### 2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

### 2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of-sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (5)

## 2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

## 2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

## 2.6 LAND USE COMPATIBILITY WITH NOISE

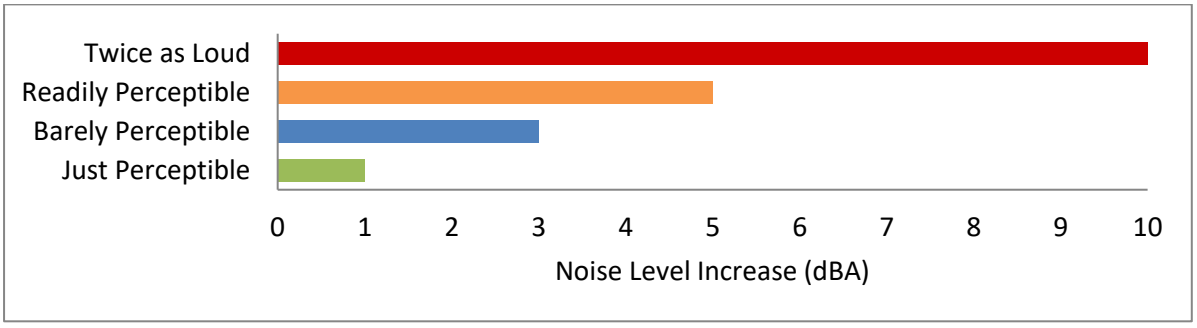
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

## 2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

**EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION**



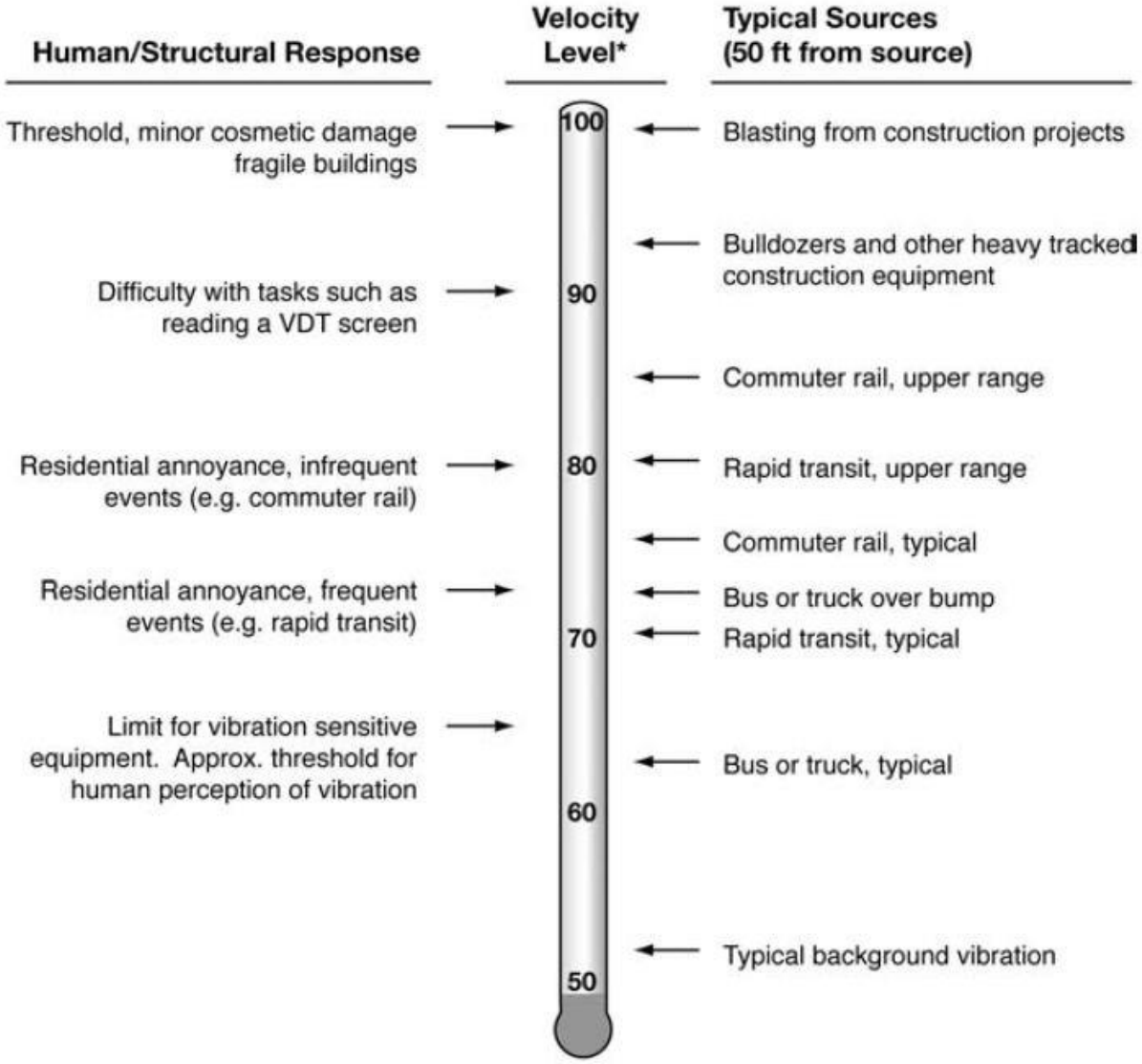
## 2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Impact Assessment Manual* (8) , vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

**EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION**




*Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual*.

## 2.9 BLASTING

The intensity of the noise and vibration impacts associated with rock blasting depends on location, size, material, shape of the rock, and the methods used to crack it. The noise produced by blasting activities is referred to as air overpressure, or an "airblast," which is generated when explosive energy in the form of gases escape from the detonating blast holes. Much like a point source, airblasts radiate outward in a spherical pattern and attenuate with each doubling of distance from the blast location, depending on the design of the blast and amount of containment.

Blasting activities generally include: the pre-drilling of holes in the hard rock area; preparation and placement of the charges in the drilled holes; a pre-blast horn signal; additional pre-blast horn signals immediately prior to the blast; and the blast itself. An additional horn signal is sounded to indicate the "all clear" after the blast and the blasting contractor has inspected the blasting area. The noise from the blast itself starts with a cracking sound from the detonator, located at a distance from the charges, and ends with the low crackling sound from each charge as they are subsequently set off. Blasts typically occur for only a few seconds, depending on their design. It is important to note that no other construction equipment will be operating during each blast in the blast area but will commence operation once the blasting contractor indicates it is safe to do so. The following calculations, analyses, and findings provided in this report is based on the 18th Edition of the *International Society of Explosives Engineer's (ISEE's) Blasters' Handbook*.

### 2.9.1 BLASTING NOISE LEVELS

Air overpressure, or "airblast," levels generated by blasting can travel up to 1,100 feet per second, depending on the size of the blast, distance from the blast, and amount of charge confinement. (10) To determine potential airblast levels (dB) from a blast, the cubed-root scaled distance ($SD_3$) is used based on the planned maximum charge weight of the blast, and distance to the receiver location being analyzed. The following equation is provided in the Blasters' Handbook to calculate the cubed root scaled distance:

$$SD_3 = R / W^{1/3}$$

Where "R" is equal to the distance to the receiver location (e.g., residential homes), and "W" is equal to the maximum charge weight detonated within any 8-millisecond period per Blasters' Handbook guidelines. With known cubed root scaled distances for each blast, the anticipated airblast levels can be calculated at the receiver location. The following equation is provided in the Blaster's Handbook for calculating airblast levels in "P," which represents air pressure in pounds per inch squared ($lbs/in^2$):

$$P = A \times (SD_3)^{-B}$$

Where "A" is equal to the intercept of a reference line with the calculated $SD_3$ value. The "A" values are based on the Blasters' Handbook for a given reference industry blast (e.g., construction, mining, etc.), and vary depending on the amount of confinement of each blast. "B" is equal to the slope of the line per Blasters' Handbook reference data. It is important to note that airblast levels are calculated in terms of pressure in the air, and do not represent perceptible noise levels typically described using A-weighted decibels (dBA). Alternatively, airblast pressure levels can be converted to linear decibels (dB) using the following equation per the Blasters' Handbook:

$$P_s = 20 \times \log(P / P_0)$$

Where "P" equals the measured or calculated overpressure, and $P_0$ represents the reference ambient air pressure ($2.9 \times 10^{-9}$ pounds/$inch^2$) per the Blasters' Handbook.

### 2.9.2 BLASTING VIBRATION LEVELS

Vibration levels generated by a blast can travel up to 20,000 feet per second, depending on the size of the blast, travel pathways (e.g., ground discontinuities), and site characteristics. (10) To determine potential vibration levels (PPV) from a blast, the square-root scaled distance ($SD_2$) is used based on the planned maximum charge weight of the blast, and distance to the receiver location being analyzed. The following equation is provided in the Blasters' Handbook to calculate the square-root scaled distance:

$$SD_2 = R / W^{1/2}$$

Where "R" is equal to the distance to the receiver location (e.g., residential homes), and "W" is equal to the maximum charge weight detonated within any 8-millisecond period per Blasters' Handbook guidelines. With known square-root scaled distances for each blast, the anticipated PPV levels can be calculated at the receiver location. The following equation is provided in the Blaster's Handbook for calculating vibration levels:

$$PPV = A \times (SD_2)^{-B}$$

Where "A" is equal to the intercept of a reference line with the calculated $SD_2$ value. The "A" values are based on the lower, best fit, or upper bound lines (provided in the Blasters' Handbook) for a given reference industry blast (e.g., construction, mining, etc.), and "B" is equal to the slope of the line.

# 3 REGULATORY SETTING

The federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

## 3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (11) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

## 3.2 KERN COUNTY GENERAL PLAN NOISE ELEMENT

Kern County has adopted a Noise Element of the General Plan to establish reasonable standards for maximum desired noise levels in Kern County and develop an implementation program which could effectively deal with the noise problem. (12) The Noise Element specifies the maximum exterior and interior noise levels for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. In addition, the Noise Element identifies noise polices designed to protect, create, and maintain an environment free from noise that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life. To ensure the that residents of Kern County are protected from excessive noise, the Noise Element identifies policy 1 to *review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses*.

In addition, Kern County General Plan Noise Element implementation measure F requires *proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dBA $L_{dn}$ and interior noise levels in excess of 45 dBA $L_{dn}$.* The County of Kern General Plan Noise Element identifies residential areas, schools, convalescent and acute care hospitals, and parks and recreational areas, and churches as noise sensitive land uses. The County of Kern Noise Element is included in Appendix 3.1 of this report.

## 3.4 KERN COUNTY NOISE REGULATIONS

The Project operational (stationary source) noise impacts are governed by the Kern County Code of Ordinances, Title 8 - Health and Safety, Chapter 8.36 - Noise Control. (13) Section 8.36 focuses on loud and raucous noise, public address systems, broadcasting, and construction noise. Section 8.36 of the Kern County Code of Ordinances is included in Appendix 3.2.

### 3.4.1 OPERATIONAL NOISE STANDARDS

While, Section 8.36 of the Kern County Code of Ordinances describes prohibited sounds, the County of Kern has not established any specific exterior noise limits to control the stationary source noise impacts associated with mining operations. Instead, the Kern County has adopted implementation policy F within the General Plan Noise Element to *require commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land use to exterior noise levels in excess of 65 dBA CNEL and interior noise levels in excess of 45 dBA CNEL.*

### 3.4.2 CONSTRUCTION NOISE STANDARDS

The Kern County Code of Ordinances does not specifically address construction noise limits; however, it does provide prohibited hours during which no construction activity may take place. According to Section 8.36.020.H, *it is unlawful for any person…to create noise from construction between the hours of 9:00 p.m. and 6:00 a.m. on weekdays and 9:00 p.m. and 8:00 a.m. on weekends, which is audible to a person with average hearing faculties or capacity at a distance 150 feet from the construction site…*

## 3.5 BLASTING REGULATIONS

To assess the Gem Hill Quarry activities that are expected to consist of blasting once per week, this analysis relies on the following airblast and vibration standards.

### 3.5.1 BLASTING NOISE STANDARDS

Based on Table 26.17 *Typical Air Overpressure Damage Criteria* of the ISEE Blasters' Handbook, an air overpressure of 133 dB is identified as a perception-based criteria level for blasting. As such, to present a conservative approach, the Project blasting-related noise and airblast levels are based on the 133 dB criteria for airblasts identified by the ISEE. This is the same blasting noise limit outlined in the sample blasting specifications on page D-5 of the Caltrans *Transportation and Construction Vibration Guidance Manual.* (9)

### 3.5.2 BLASTING VIBRATION STANDARDS

Blasting can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. To analyze vibration impacts originating from the Gem Hill Quarry, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the Kern County does not identify specific vibration level limits. Therefore, for analysis purposes,

the Caltrans *Transportation and Construction Vibration Guidance Manual*, (9 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec).

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# 4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

## 4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach *recognizes that there is no single noise increase that renders the noise impact significant.* (14) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level ($L_{eq}$). The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (16 p. 2_48).

## 4.2 VIBRATION (THRESHOLD B)

As described in Section 3.6, the vibration impacts originating from the construction of the Gem Hill Quarry, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable vibration threshold of 0.3 PPV (in/sec).

## 4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or air strips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the Mojave Air & Space Port located over 9 miles north of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

## 4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

**TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY**

| Analysis | Condition(s) | Significance Criteria | |
|---|---|---|---|
| | | Daytime | Nighttime |
| Off-Site Traffic | If ambient is < 60 dBA CNEL[1] | ≥ 5 dBA CNEL Project increase | |
| | If ambient is 60 - 65 dBA CNEL[1] | ≥ 3 dBA CNEL Project increase | |
| | If ambient is > 65 dBA CNEL[1] | ≥ 1.5 dBA CNEL Project increase | |
| Operational | Exterior Noise Level Standards[2] | 65 dBA CNEL | 45 dBA CNEL |
| | If ambient is < 60 dBA CNEL[1] | ≥ 5 dBA CNEL Project increase | |
| | If ambient is 60 - 65 dBA CNEL[1] | ≥ 3 dBA CNEL Project increase | |
| | If ambient is > 65 dBA CNEL[1] | ≥ 1.5 dBA CNEL Project increase | |
| Blasting | Airblast Standard[3] | 133 dB | |
| | Vibration Level Standard[4] | 0.3 PPV (in/sec) | |

[1] FICON, 1992.
[2] Kern County General Plan Noise Element implementation measure (F).
[3] ISEE's Blasters' Handbook, Table 26.17 Typical Air Overpressure Damage Criteria.
[4] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

# 5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Monday, December 6th, 2021. Appendix 5.1 includes study area photos.

## 5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

## 5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

## 5.3 NOISE MEASUREMENT RESULTS

The equivalent sound level ($L_{eq}$) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) nighttime (10:00 p.m. to 7:00 a.m.) and the composite 24-hour CNEL noise levels at each noise level measurement location.

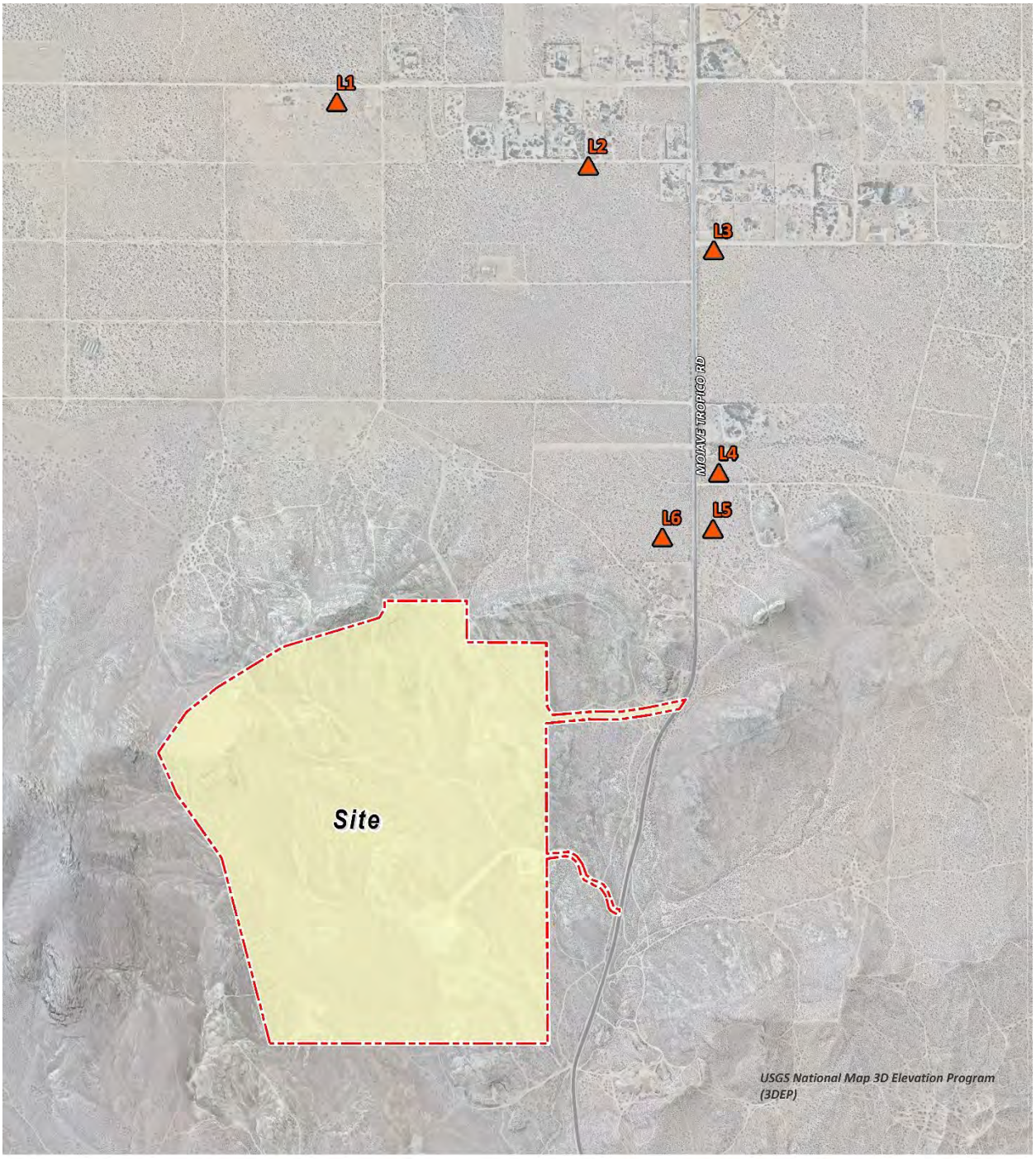
**TABLE 5-1: AMBIENT NOISE LEVEL MEASUREMENTS**

| Location[1] | Description | Energy Average Noise Level (dBA $L_{eq}$)[2] | | CNEL |
|---|---|---|---|---|
| | | Daytime | Nighttime | |
| L1 | Located north of the Project site near single-family residence at 5146 Montiverde Road. | 40.9 | 36.5 | 44.1 |
| L2 | Located north of the Project site near single-family residence at 4701 Sunbow Avenue. | 40.6 | 36.9 | 44.3 |
| L3 | Located northeast of the Project site near single-family residence at 4488 Gayiety Avenue. | 45.3 | 42.5 | 49.7 |
| L4 | Located northeast of the Project site near single-family residence at 7494 Mojave-Tropico Road. | 46.6 | 43.8 | 51.1 |
| L5 | Located northeast of the Project site near single-family residence at 7288 Mojave Tropico Road. | 45.1 | 41.8 | 49.2 |
| L6 | Located northeast of the Project site near single-family residence at 7167 Mojave Tropico Road. | 43.3 | 42.2 | 49.0 |

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the equivalent noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each of the daytime and nighttime hours.

## EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS



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# 6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise levels on the Project haul routes.

## 6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (18) This methodology is commonly used to describe the off-site traffic noise levels throughout California. The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (19) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (20)

### 6.1.1 OFF-SITE (HAUL ROUTE) TRAFFIC NOISE PREDICTION MODEL INPUTS

According to the *Gem Hill Quarry Trip Generation Assessment (Revised) by Urban Crossroads, Inc.*, there are 67 trucks anticipated per day, or 134 truck trips (two-way trucks, inbound and outbound). Approximately 7 trucks are anticipated to leave and return each hour, with the last trucks leaving between 4-5 PM. The site will have up to 10 employees with all employees would arrive on-site prior to trucks (or by 7 AM) and departing for the day after 5 PM. Product (pozzolan) will be transported via 25-ton street-legal haul trucks from the site to various off-site destinations. There will also be one 3-axle water truck transporting water to the site, with one inbound trip prior to 7 AM, with none during 7-9 AM or any time after 4 PM.

To describe the Project haul route off-site haul route traffic noise level impacts, four study area roadway segments were identified as shown on Exhibit 6-A. Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the four off-site study area roadway segments, the centerline distance to adjacent land use, and the vehicle speeds.

## EXHIBIT 6-A: OFF-SITE (HAUL ROUTE) STUDY AREA ROADWAY SEGMENTS

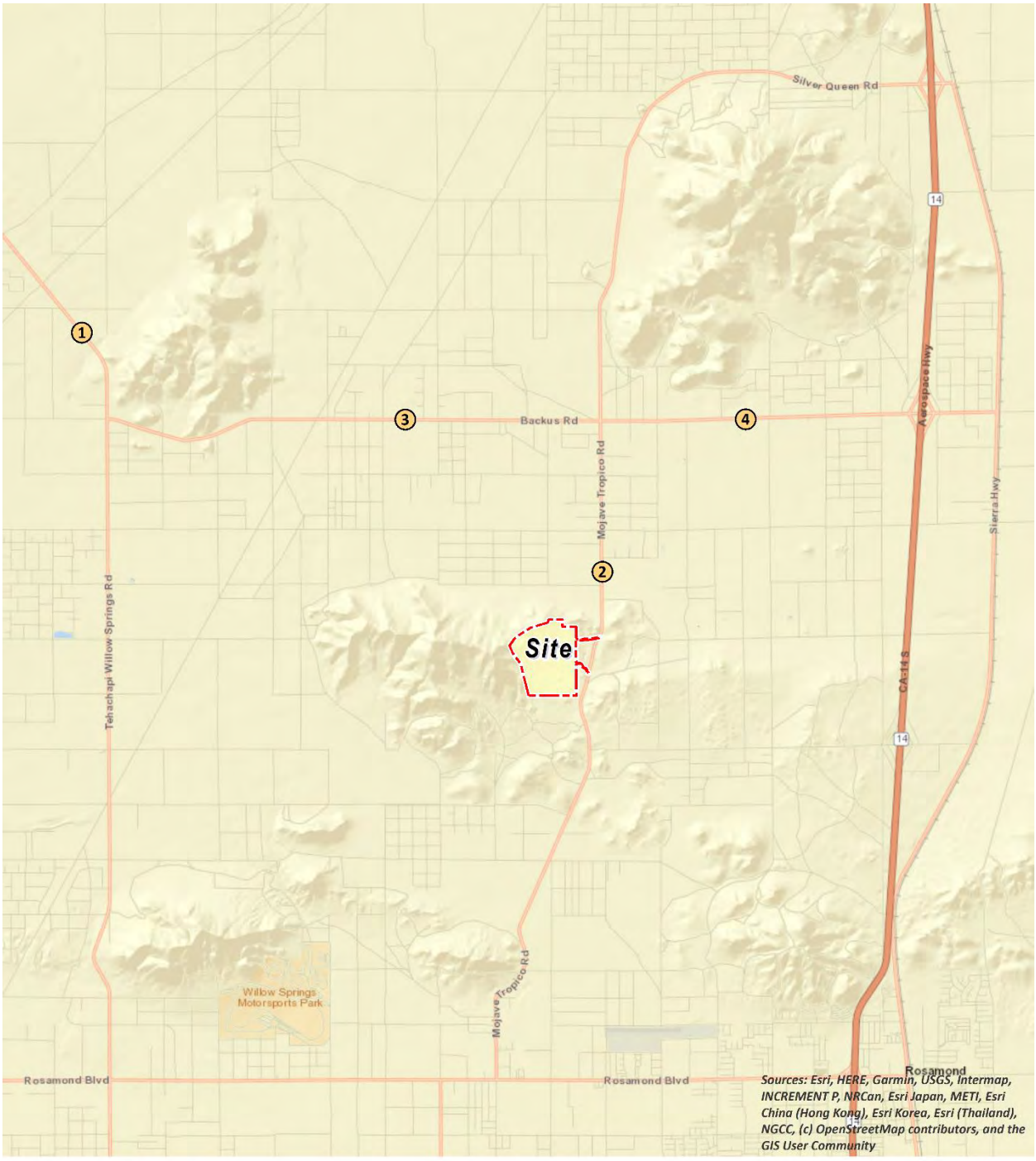


**TABLE 6-1: OFF-SITE ROADWAY PARAMETERS**

| ID | Roadway | Segment | Existing Configuration[1] | Centerline Distance to Receiving Land Use[2] | Vehicle Speed (mph) |
|---|---|---|---|---|---|
| 1 | Willow Springs Rd. | n/o Backus Rd. | 2-Lane Collector | 55' | 55 |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 2-Lane Collector | 55' | 55 |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 2-Lane Collector | 55' | 55 |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 2-Lane Collector | 55' | 55 |

[1] Existing lane configuration based on a review of aerial photography.
[2] Based upon the right-of-way distances for each roadway classification provided in the General Plan Circulation Element.

The existing Average Daily Traffic (ADT) volumes used in this study area presented on Table 6-2 are based on the Kern Council of Governments Regional Traffic Count Data (21). The existing with Project ADT volume includes the Project trips based on the trip generation and trip distributions presented in the *Gem Hill Quarry Trip Generation Assessment (Revised) by Urban Crossroads, Inc.* (22) The street-legal haul trucks with a capacity of approximately 25 tons will exist the site on the main access road and travel north on Mojave Tropico Road for 2.5 miles with approximately 75% of trucks traveling west on Backus Road, northwest on Willow Springs Road for 8 miles, and east on Oak Creek Road for 3.5 miles to the Mojave Plane entrance with the remaining 25% traveling east on Backus Road to SR-14 and then traveling to various client locations. This analysis relies on a comparative evaluation of the off-site (haul route) traffic noise impacts at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project traffic study.

**TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES**

| ID | Roadway | Segment | Existing Average Daily Traffic Volumes (ADT) | |
|---|---|---|---|---|
| | | | Without Project[1] | With Project[2] |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 1,790 | 1,906 |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 1,029 | 1,183 |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 1,146 | 1,261 |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 2,246 | 2,292 |

[1] Kern Council of Governments Regional Traffic Count Data
[2] Gem Hill Quarry Trip Generation Assessment (Revised), Urban Crossroads, Inc.

To quantify the off-site noise levels, the Project related haul route truck trips were added to the heavy truck category in the FHWA noise prediction model (see Appendix 6.1). The addition of the Project related haul route truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Table 6-5 shows the vehicle mix used for the existing with Project traffic condition.

**TABLE 6-3: TIME OF DAY VEHICLE SPLITS**

| Vehicle Type | Time of Day Splits | | | Total of Time of Day Splits |
|---|---|---|---|---|
| | Daytime | Evening | Nighttime | |
| Autos | 77.50% | 12.90% | 9.60% | 100.00% |
| Medium Trucks | 84.80% | 4.90% | 10.30% | 100.00% |
| Heavy Trucks | 86.50% | 2.70% | 10.80% | 100.00% |

"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

**TABLE 6-4: WITHOUT PROJECT VEHICLE MIX**

| Classification | Total % Traffic Flow | | | Total |
|---|---|---|---|---|
| | Autos | Medium Trucks | Heavy Trucks | |
| All Roadways[1] | 97.42% | 1.84% | 0.74% | 100.00% |

[1] Typical California vehicle mix.

**TABLE 6-5: EXISTING WITH PROJECT VEHICLE MIX**

| ID | Roadway | Segment | With Project[1] | | | |
|---|---|---|---|---|---|---|
| | | | Autos | Medium Trucks | Heavy Trucks | Total |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 92.30% | 1.73% | 5.97% | 100.00% |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 86.43% | 1.60% | 11.97% | 100.00% |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 89.69% | 1.67% | 8.64% | 100.00% |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 95.72% | 1.80% | 2.48% | 100.00% |

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

# 7 OFF-SITE (HAUL ROUTE) TRAFFIC NOISE

To assess the off-site transportation CNEL noise level impacts associated with the proposed Project, noise contours were developed based on the Project trips and distributions from the *Gem Hill Quarry Trip Generation Assessment (Revised) by Urban Crossroads, Inc.*

## 7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise increase at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 to 7-2 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets.

**TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS**

| ID | Road | Segment | CNEL at Nearest Receiving Land Use (dBA)[1] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|
| | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 60.6 | RW | RW | 13 |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 58.2 | RW | RW | RW |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 58.7 | RW | RW | RW |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 61.6 | RW | RW | 15 |

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

**TABLE 7-2: EXISTING WITH PROJECT CONTOURS**

| ID | Road | Segment | CNEL at Nearest Receiving Land Use (dBA)[1] | Distance to Contour from Centerline (Feet) | | |
|---|---|---|---|---|---|---|
| | | | | 70 dBA CNEL | 65 dBA CNEL | 60 dBA CNEL |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 62.5 | RW | RW | 17 |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 61.8 | RW | RW | 16 |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 61.4 | RW | RW | 15 |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 62.3 | RW | RW | 17 |

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest receiving land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

## 7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 58.2 to 61.6 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions ranging from 61.4 to 62.5 dBA CNEL. Table 7-3 shows that the Project off-site (haul route) traffic noise level increases range from 0.7 to 3.6 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Section 4.1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level impacts due to the Project-related off-site haul route traffic noise levels.

**TABLE 7-3: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES**

| ID | Road | Segment | CNEL at Receiving Land Use (dBA)[1] | | | Incremental Noise Level Increase Threshold[2] | |
|---|---|---|---|---|---|---|---|
| | | | No Project | With Project | Project Addition | Limit | Exceeded? |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 60.6 | 62.5 | 1.9 | 3.0 | No |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 58.2 | 61.8 | 3.6 | 5.0 | No |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 58.7 | 61.4 | 2.7 | 5.0 | No |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 61.6 | 62.3 | 0.7 | 3.0 | No |

[1] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[2] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

# 8 SENSITIVE RECEIVER LOCATIONS

To assess the potential for Project-related operational noise and short-term blasting noise and vibration impacts, the following sensitive receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land.

According to the Kern County General Plan noise-sensitive land uses are generally considered to include residential areas, schools, convalescent and acute care hospitals, and parks and recreational areas, and churches. To describe the potential off-site Project noise levels, six sensitive receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site.

The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents the proposed noise sensitive residence at 5146 Montiverde Road, approximately 4,181 feet north of the Project site. Receiver R1 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 4841 Sunbow Avenue, approximately 3,655 feet north of the Project site. Receiver R2 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

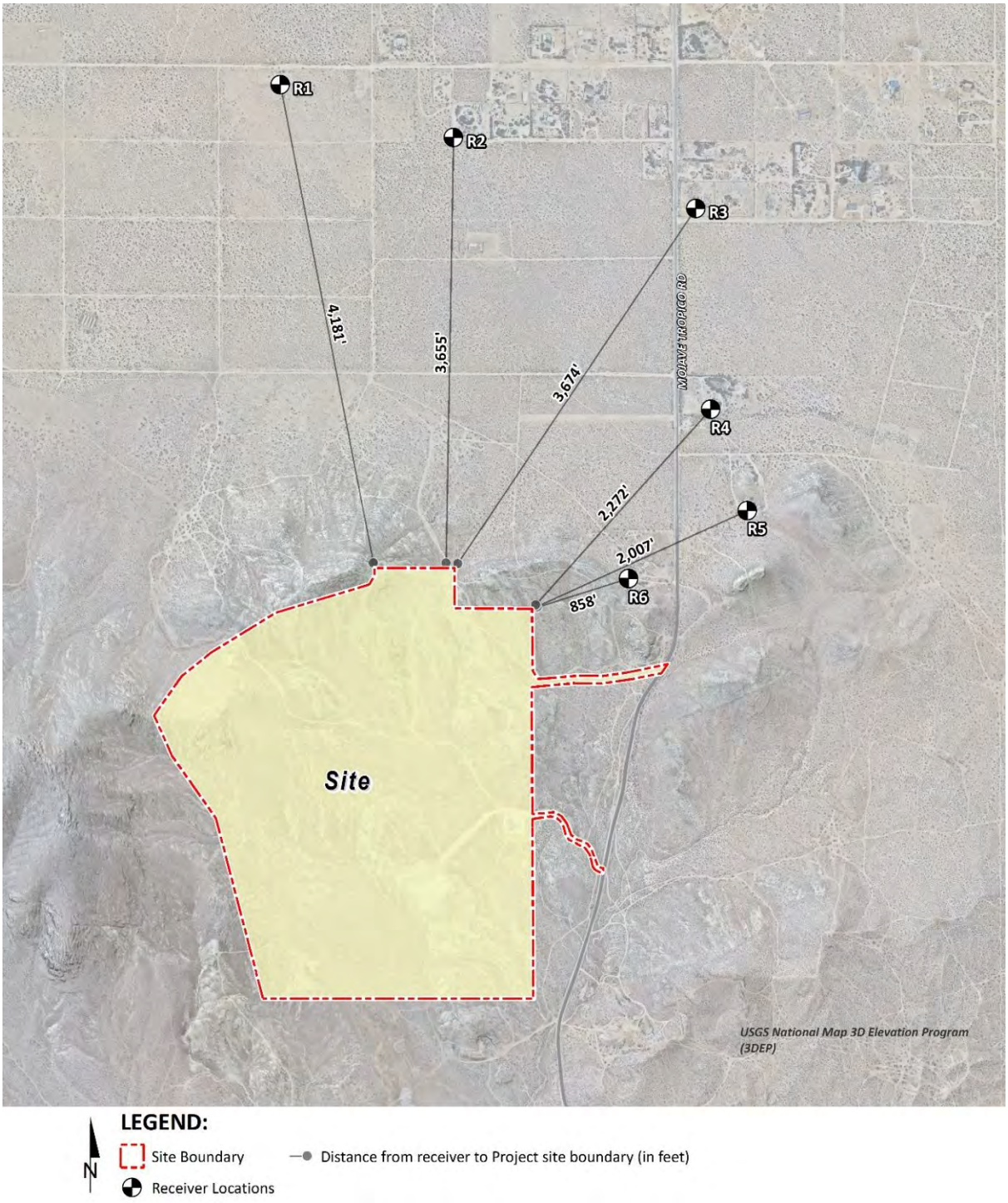
R3: Location R3 represents the proposed noise sensitive residence at 4488 Gayiety Avenue, approximately 3,674 feet northeast of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R3 is placed at the building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the proposed noise sensitive residence at 7494 Mojave-Tropico Road, approximately 2,272 feet northeast of the Project site. Receiver R4 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents the existing noise sensitive residence at 7288 Mojave Tropico Road, approximately 2,007 feet northeast of the Project site. Receiver R5 is placed at the private outdoor living areas (backyards) facing the Project site. A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the proposed noise sensitive residence at 7167 Mojave Tropico Road, approximately 858 feet northeast of the Project site. Receiver R6 is placed in the outdoor living area (private backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

**EXHIBIT 8-A: RECEIVER LOCATIONS**



# 9 OPERATIONAL NOISE ANALSIS

This section analyzes the potential Project noise impacts at the nearest receiver locations, identified in Section 8, resulting from the expected operation of the proposed Gem Hill Quarry.

## 9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the typical quarry activities at the Project site. The on-site Project-related noise sources are expected to include: onsite haul truck operation, onsite haul truck loading/unloading, and onsite stockpiling activity. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels. Consistent with the updated Project description, typical hours of Gem Hill Quarry mining operations will be during daylight hours (generally 7:00 a.m. to 7:00 p.m. Monday through Saturday). Since market demand may require longer or alternative hours due to operational constraints, this analysis includes evening and nighttime mining noise source activity representing continuous operation for a full 24 hours. This approach conservatively overstates the expected mining noise source activities.

## 9.2 REFERENCE NOISE LEVELS

To estimate the Gem Hill Quarry noise levels, reference noise level measurements shown on Table 9-1 were collected from activities at similar quarry sites.

**TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS**

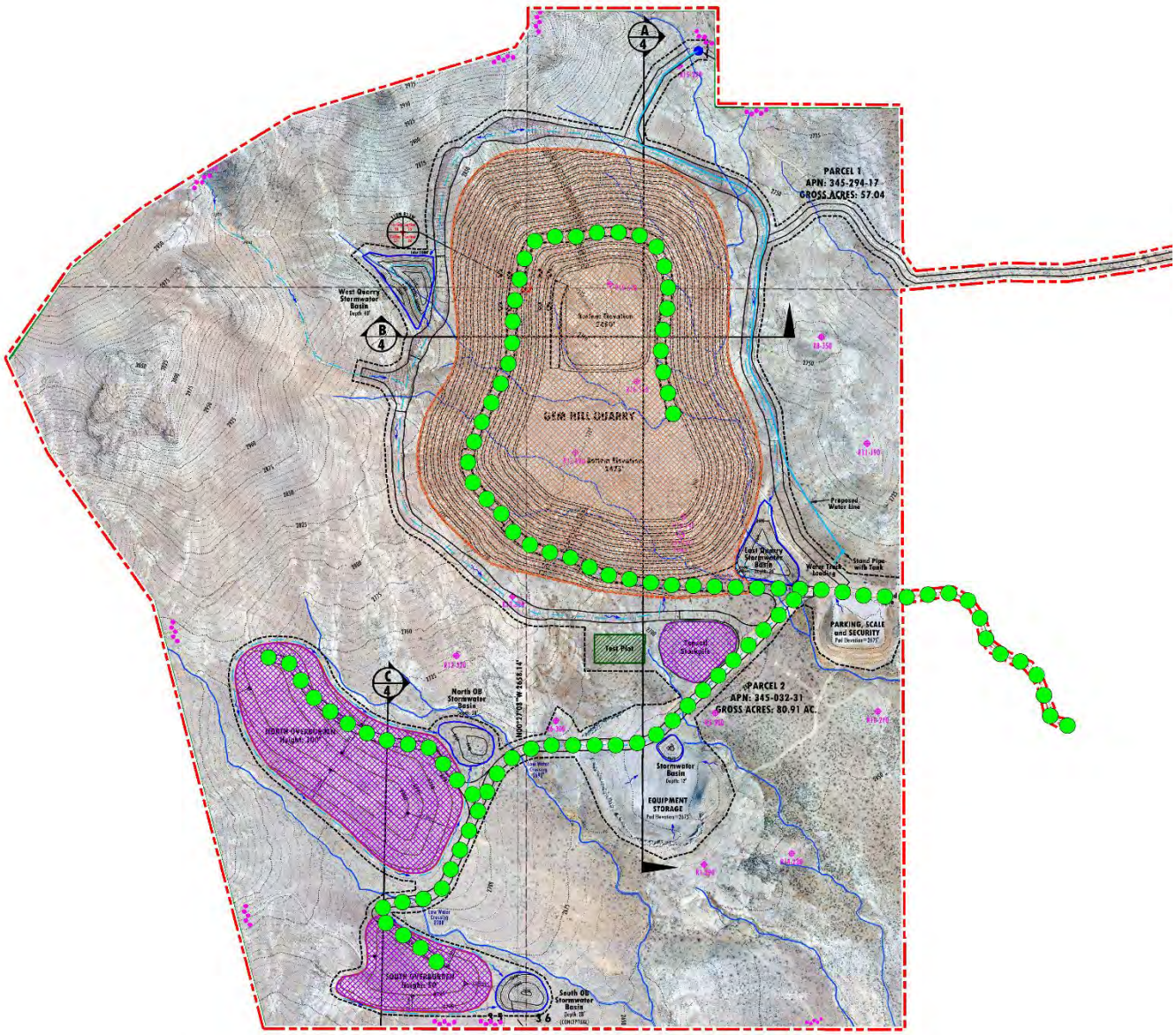
| Noise Source | Duration (hh:mm:ss) | Ref. Distance (Feet) | Noise Source Height (Feet) | Reference Noise Level (dBA $L_{eq}$) | | Sound Power Level (dBA)[3] |
|---|---|---|---|---|---|---|
| | | | | @ Ref. Dist. | @ 50 Feet | |
| Onsite Haul Truck Operation[1] | 0:00:10 | 50' | 8' | 62.1 | 62.1 | 94.1 |
| Onsite Haul Truck Loading/Unloading[1] | 0:00:10 | 30' | 8' | 79.8 | 75.4 | 101.0 |
| Onsite Stockpiling[2] | 0:00:34 | 35' | 30' | 82.7 | 79.6 | 111.2 |

[1] As measured by Urban Crossroads, Inc. at the Robertson's Gilman Springs quarry in the City of Banning.
[2] As measured by Urban Crossroads, Inc. at the US Gypsum quarry in Imperial County.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calibrated using the CadnaA noise model at the reference distance to the noise source.

### 9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precision sound level meter (serial number 01146). The calibration of the meter was completed using a Larson Davis CAL200 calibrator. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

## EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



### 9.2.2 ONSITE HAUL TRUCK OPERATION

To describe the potential noise level impacts associated with onsite haul truck operations, a reference noise level measurement was collected at the Robertson's quarry in the City of Banning. The reference noise level measurement includes the loading of haul truck trailers beneath the bin, and haul truck operations. A reference noise level of 62.1 dBA $L_{eq}$ was measured at a uniform reference distance of 50 feet.

### 9.2.3 ONSITE HAUL TRUCK MATERIAL LOADING/UNLOADING

To assess the potential noise impacts created by loaders during quarry operations within the Project site, a reference noise level measurement was taken at the Robertson's quarry in the City of Banning. The reference noise level measurement represents the typical operation of a 988G Caterpillar wheeled loader including forward and backward movements, and backup alarm noise. At a uniform reference distance of 50 feet from the loader, the reference noise level is 75.4 dBA $L_{eq}$.

### 9.2.4 ONSITE STOCKPILING ACTIVITY

The stockpiling activity noise level measurement represents constant stockpiling activity at the U.S. Gypsum quarry in Imperial County with a reference noise level of 79.6 dBA $L_{eq}$ at a uniform reference distance of 50 feet. The reference stockpiling activity noise level measurement includes a roughly 30-foot-high noise source height with background crushing activities.

## 9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise prediction model relies on the reference sound power level ($L_w$) to describe individual noise sources. While sound pressure levels (e.g., $L_{eq}$) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels ($L_w$) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground

attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model used to estimate the Project operational noise levels presented in this section.

## 9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include onsite haul truck operation, onsite haul truck loading/unloading, and onsite stockpiling activity, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the nearest sensitive receiver locations. Table 9-2 shows the Project operational noise levels are expected to range from 31.6 to 41.8 dBA CNEL at the nearest off-site sensitive receiver locations.

**TABLE 9-2: PROJECT OPERATIONAL NOISE LEVELS**

| Noise Source[1] | Project Noise Levels by Receiver Location (dBA CNEL) | | | | | |
|---|---|---|---|---|---|---|
| | R1 | R2 | R3 | R4 | R5 | R6 |
| Onsite Haul Truck Operation | 16.1 | 20.5 | 21.1 | 23.9 | 25.6 | 26.6 |
| Onsite Haul Truck Loading/Unloading | 20.0 | 23.5 | 24.4 | 26.8 | 28.8 | 28.7 |
| Onsite Stockpiling | 31.3 | 34.3 | 34.4 | 39.7 | 41.6 | 41.3 |
| **Total (All Noise Sources)** | **31.6** | **34.6** | **34.8** | **39.9** | **41.8** | **41.5** |

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

## 9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the Kern County exterior noise level standards at nearby noise-sensitive receiver locations. Table 9-3 shows the operational noise levels associated with Gem Hill Quarry Project will satisfy the Kern County 65 dBA CNEL exterior noise level standards identify in the Kern County General Plan Noise Element implementation measure F at all the nearest noise sensitive receiver locations. Therefore, the operational exterior noise impacts are considered *less than significant*.

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 20 dBA noise reduction with "windows closed." (4 pp. 30-31) Since the unmitigated exterior noise levels are estimated to range from 31.6 to 41.8 dBA CNEL, the interior noise levels are with a “windows open” are estimated at 19.6 to 29.8 dBA CNEL. The analysis shows that the unmitigated interior noise levels at the at all the nearest noise sensitive receiver locations will satisfy the Kern County 45 dBA CNEL interior noise level standards identify in the Kern County General Plan Noise Element implementation measure F at all the nearest noise sensitive receiver locations. Therefore, the operational interior noise impacts are considered *less than significant*.

**TABLE 9-3: OPERATIONAL NOISE LEVEL COMPLIANCE**

| Receiver Location[1] | Location | Project Noise Levels (dBA CNEL)[2] | Exterior Noise Level Standard (dBA CNEL)[3] | Noise Level Standard Exceeded?[4] |
|---|---|---|---|---|
| R1 | 5146 Montiverde Rd. | 31.6 | 65 | No |
| R2 | 4841 Sunbow Ave. | 34.6 | 65 | No |
| R3 | 4488 Gayiety Ave. | 34.8 | 65 | No |
| R4 | 7494 Mojave-Tropico Rd. | 39.9 | 65 | No |
| R5 | 7288 Mojave-Tropico Rd. | 41.8 | 65 | No |
| R6 | 7167 Mojave-Tropico Rd. | 41.5 | 65 | No |

[1] See Exhibit 8-A for the receiver locations.
[2] Proposed Project noise levels as shown on Table 9-2.
[3] Kern County General Plan Noise Element implementation measure (F).
[4] Do the estimated Project noise source activities exceed the exterior noise level standards?

Following completion of mining activities, the project site would be reclaimed. All remaining equipment, utilities, and internal roads not needed for site access, reclamation, revegetation, and general site monitoring, will be removed, and reclaimed within three years. It is expected that noise and vibration levels associated with reclamation activities would be the same or less than those associated with project operations.

## 9.5 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearest receiver locations potentially impacted by Project operational noise source activities. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. As indicated on Tables 9-4, the Project will generate an operational noise level increases ranging from 0.1 to 0.7 dBA $L_{eq}$ at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the Project related operational incremental noise level increases at the sensitive receiver locations will be *less than significant.*

**TABLE 9-4: PROJECT OPERATIONAL NOISE LEVEL INCREASES**

| Receiver Location[1] | Total Project Operational Noise Level[2] | Measurement Location[3] | Reference Ambient Noise Levels[4] | Combined Project and Ambient[5] | Project Increase[6] | Noise Sensitive Land Use? | Increase Criteria[7] | Increase Criteria Exceeded? |
|---|---|---|---|---|---|---|---|---|
| R1 | 31.6 | L1 | 44.1 | 44.3 | 0.2 | Yes | 5.0 | No |
| R2 | 34.6 | L2 | 44.3 | 44.7 | 0.4 | Yes | 5.0 | No |
| R3 | 34.8 | L3 | 49.7 | 49.8 | 0.1 | Yes | 5.0 | No |
| R4 | 39.9 | L4 | 51.1 | 51.4 | 0.3 | Yes | 5.0 | No |
| R5 | 41.8 | L5 | 49.2 | 49.9 | 0.7 | Yes | 5.0 | No |
| R6 | 41.5 | L6 | 49.0 | 49.7 | 0.7 | Yes | 5.0 | No |

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

## 9.6 OPERATIONAL VIBRATION IMPACTS

The Project operational vibration impacts will include off-site (haul route) heavy trucks activity. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. According to the FTA *Transit Noise Impact and Vibration Assessment* trucks rarely create vibration that exceed 70 VdB (0.0032 PPV in/sec) (unless there are bumps due to frequent potholes in the road). (8 p. 113) Since the heavy trucks will be travelling at very low speeds on smooth surfaces, it is expected that off-site (haul route) heavy truck vibration impacts at nearby receiver locations will not be considered perceptible and therefore, will be *less than significant*.

# 10 BLASTING ANALYSIS

The use and handling of all explosive materials shall be done by fully trained and experienced personnel. All blasters shall possess a current blasting license issued by the California Occupational Safety and Health Administration CAL/OSHA and hold applicable insurance. The blasting contractor's employees must be trained in accordance with CAL/OSHA and Mine Safety and Health Administration (MSHA) requirements and possess certification of such training. Blasting shall only be conducted by a licensed blaster under the Office of Surface Mining Reclamation and Enforcement (OSMRE) Blasting Performance standards (30 CFR Section 816.61-68). Blasting is planned approximately once per week.

## 10.1 AIRBLAST NOISE LEVELS

Due to the short-term instantaneous nature of blasting, the Project blasting-related airblast levels are based on the 133 dB criteria identified by the ISEE. The blasting airblast impacts described below represent the worst-case (closest) blast locations describing the potential impacts when measured from the edge of the nearest blast area to the nearest receiver location. When measured at greater distances, the blasts will result in lower airblast noise levels. The airblast noise level calculations are included in Appendix 10.1.

This analysis describes partially confined airblast levels since they are calculated using the Blasters' Handbook equation for general construction blasting activities. Table 10-1 shows that the calculated airblast levels from the worst-case (closest) Project blasting activities are expected to range from 95.3 to 110.5 dB. The Project airblast levels are shown to satisfy the 133 dB airblast threshold at the nearest noise sensitive residential receiver locations. Therefore, the Project-related airblast noise level impacts are considered *less than significant* during blasting activities at the Project site.

**TABLE 10-1: PROJECT AIRBLAST LEVELS**

| Receiver Location[1] | Location | Distance (Feet) | Airblast Level (dB)[2] | Airblast Standard (dB)[3] | Airblast Standard Exceeded?[4] |
|---|---|---|---|---|---|
| R1 | 5146 Montiverde Rd. | 4,181' | 95.3 | 133 | No |
| R2 | 4841 Sunbow Ave. | 3,655' | 96.6 | 133 | No |
| R3 | 4488 Gayiety Ave. | 3,674' | 96.6 | 133 | No |
| R4 | 7494 Mojave-Tropico Rd. | 2,272' | 101.1 | 133 | No |
| R5 | 7288 Mojave-Tropico Rd. | 2,007' | 102.3 | 133 | No |
| R6 | 7167 Mojave-Tropico Rd. | 858' | 110.5 | 133 | No |

[1] See Exhibit 8-A for the receiver locations.
[2] Based on input data provided by California Drilling & Blasting. Calculations are provided in Appendix 10.1 for each blast location.
[3] ISEE's Blasters' Handbook, Table 26.17 Typical Air Overpressure Damage Criteria.
[4] Do the estimated airblast levels exceed the airblast standard?

## 10.2 BLASTING VIBRATION

The vibration criteria used in this noise study to assess potential temporary building damage impacts at adjacent receiver locations are based on the Caltrans *Transportation and Construction Vibration Guidance Manual*, (9 p. 38) Table 19. The blasting vibration impacts described below represent the worst-case (closest) blast locations describing the potential impacts when measured from the edge of the nearest blast area to the nearest receiver location. When measured at greater distances, the blasts will result in lower vibration levels. The blasting calculations are included in Appendix 10.1. Since most of the buildings near the Project site can best be described as "older residential buildings", Caltrans guidance identifies a maximum acceptable peak-particle-velocity (PPV) vibration threshold of 0.3 inches per second (in/sec). Therefore, the 0.3 PPV (in/sec) vibration threshold is used to evaluate the potential blasting-related vibration levels experienced at the nearest residential homes.

Table 10-2 shows the calculated vibration levels for the worst-case (closest) blast locations at the nearest residential homes. The vibration levels of Project blasts are expected to range from 0.00 to 0.04 PPV (in/sec). Table 10-2 shows that the Project blasting vibration levels will remain below the maximum acceptable peak-particle-velocity (PPV) vibration threshold 0.3 PPV (in/sec) all the nearby noise sensitive residential receiver locations, and therefore, represent a *less than significant* impact.

**TABLE 10-2: PROJECT BLASTING VIBRATION LEVELS**

| Receiver Location[1] | Location | Distance (Feet) | Vibration Level (PPV)[2] | Vibration Standard (PPV)[3] | Vibration Standard Exceeded?[4] |
|---|---|---|---|---|---|
| R1 | 5146 Montiverde Rd. | 4,181' | 0.00 | 0.3 | No |
| R2 | 4841 Sunbow Ave. | 3,655' | 0.00 | 0.3 | No |
| R3 | 4488 Gayiety Ave. | 3,674' | 0.00 | 0.3 | No |
| R4 | 7494 Mojave-Tropico Rd. | 2,272' | 0.01 | 0.3 | No |
| R5 | 7288 Mojave-Tropico Rd. | 2,007' | 0.01 | 0.3 | No |
| R6 | 7167 Mojave-Tropico Rd. | 858' | 0.04 | 0.3 | No |

[1] See Exhibit 8-A for the receiver locations.
[2] Based on input data provided by California Drilling & Blasting. Calculations are provided in Appendix 10.1 for each blast location.
[3] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
[4] Do the estimated vibration levels exceed the vibration standard?

# 11 REFERENCES


1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **Environmental Protection Agency Office of Noise Abatement and Control.** *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation Federal Highway Administration.** *Highway Noise Barrier Design Handbook.* 2001.
6. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
7. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
8. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
9. **International Society of Explosives Engineer's.** *Blasters' Handbook, 18th Edition.* 2014.
10. **Office of Planning and Research.** *State of California General Plan Guidelines.* 2019.
11. **Kern County.** *General Plan Noise Element.* September 2009.
12. **County of Kern.** *Code of Ordinances, Title 8 - Heath and Safety, Chapter 8.36 - Noise Control.*
13. **California Department of Transportation.** *Transportation and Construction Vibration Guidance Manual.* April 2020.
14. **California Court of Appeal.** *Gray v. County of Madera, F053661.* 167 Cal.App.4th 1099; - Cal.Rptr.3d, October 2008.
15. **Federal Interagency Committee on Noise.** *Federal Agency Review of Selected Airport Noise Analysis Issues.* August 1992.
16. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
17. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
18. **U.S. Department of Transportation, Federal Highway Administration.** *FHWA Highway Traffic Noise Prediction Model.* December 1978. FHWA-RD-77-108.
19. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
20. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

21. **Kern Council of Governments.** Regional Traffic Count Data. [Online] [Cited: 1 11, 2022.] https://www.kerncog.org/traffic-counts/.

22. **Urban Crossroads, Inc.** *Gem Hill Quarry Trip Generation Assessment (Revised).*

# 12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Gem Hill Quarry Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

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**EDUCATION**

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

**PROFESSIONAL REGISTRATIONS**

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

**PROFESSIONAL AFFILIATIONS**

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

**PROFESSIONAL CERTIFICATIONS**

Certified Acoustical Consultant – County of San Diego • March, 2018
Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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# APPENDIX 3.1:

# KERN COUNTY NOISE ELEMENT

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# Noise Element

## Chapter 3

# 3. NOISE ELEMENT

## 3.1 INTRODUCTION

The Noise Element is a mandatory element of the General Plan (California Government Code Section 65302 (f)). The State, recognizing the effects of noise upon people's health and well being, required that local jurisdictions prepare statements of policy indicating their intentions regarding noise and noise sources, establish desired maximum noise levels according to land use categories, set standards for noise emission from transportation facilities and fixed-point sources, and prepare a program for implementation of noise control measures. Noise Elements are prepared in accordance with Guidelines for the Preparation and Content of Noise Elements of the General Plan published by the California Office of Noise Control in 1976. Those Guidelines are found in Appendix A of the General Plan Guidelines prepared by the State Office of Planning and Research (OPR).

The major purpose of the Noise Element is to: (1) establish reasonable standards for maximum desired noise levels in Kern County, and; (2) develop an implementation program which could effectively deal with the noise problem.

Considerable research has been done to determine the effects of various sound pressure levels on human health and on the successful performance of various human activities. It is known that noises of 120 dB(A) and higher will cause ear pain in most people; much lower levels may have permanent adverse effects on hearing.

The federal standards for industrial safety regulate the amount of time workers may be exposed to sound levels above 90 dB(A). This level was selected on the assumption that inability to hear at frequencies above 2,000 Hz is unimportant to speech communication. Tests show, however, that hearing loss of this extent will have an adverse effect on hearing low-level conversation and on hearing ordinary speech in the presence of background noise levels which commonly occur in everyday listening conditions.

It is desirable to control ambient noise level to reduce the adverse effects of noise. Ambient noise is the all-encompassing noise associated with a given environment; it usually is a composite of sounds from many sources, near and far.

The U.S. Environmental Protection Agency and the California Department of Health have suggested standards for ambient noise. These suggestions have been utilized in developing noise standards in Kern County.

Of primary importance in controlling noise in Kern County is protection of the public health, particularly insuring against hearing loss resulting from community noise. Next in importance is minimization of adverse effects of noise on the economic well-being of the community, and third, minimization of annoyance caused by noise.

Good land use planning should be employed to insure that the quality of the noise environment in Kern County does not deteriorate, and whenever practical be improved. Where noise sensitive uses are proposed, appropriate noise control measures shall be required as a condition of approval for discretionary projects. Measures to control the quality of the noise environment could include architectural design to reduce noise impact, acoustical insulation of exterior walls and construction of sound barriers.

The following major noise sources were considered in the preparation of the Noise Element:

- Highways and freeways
- Primary arterial and major local streets
- Railroad operations
- Aircraft and airport operations
- Local industrial facilities
- Other stationary sources

Railroad noise, although louder than highway noise, generally affects smaller areas. Railroad yards and rail alignments adjacent to residential areas should have noise barriers. Acoustical noise barriers could reduce existing rail noise up to 20 dB (A).

Little can be done to control airport noise. Through Federal standards more rigid noise controls are being required on aircraft. By adjusting the times of arrival and departure, flight patterns, and the time of day that high noise levels occur, noise levels from airports can be made more tolerable.

Noise contours have been prepared for all airports in the County, major railroad and highways within urban areas. Airport noise contours should be used to determine where noise insulation might be required and are located in the Airport Land Use Compatibility Plan (ALUCP). Any new airport or airport extension will be required to provide estimates of noise impact in conjunction with the required Master Plan updates to the ALUCP. The highway noise contours are contained in Appendix G. Noise contours for Interstate 5; State Route 14, 33, 43, 58, 99, 119, 155, 166, 178, 184, 202, 204, 223, and 395 are shown in Appendix G. Noise contours for the AT & SF Railroad, Southern Pacific Railroad, and Sunset Railroad are shown in Appendix G. The highway and railroad contours are not intended to provide distinct boundaries between noise levels, but as approximations of noise levels that can serve as the basis for further studies. As

these studies are completed, noise treatment may be needed to compensate for higher noise levels.

**Definitions**

1. Community Noise Equivalent Level (CNEL) – A measure of the cumulative noise exposure in the community, with greater weights applied to evening and nighttime periods. For CNEL calculations, day is defined as 7 a.m. to 7 p.m., and this period has a weighting factor of one; evening is 7 p.m. to 10 p.m. and has a weighting factor of three; and night is from 10 p.m. to 7 a.m. and has a weighting factor of ten. Noises occurring at night are given a substantially heavier weight, since for most people, this is the time when noise is most disturbing.

2. Day Night Average Sound Level, Ldn – The same as CNEL except that the evening time period is not considered separately, but instead it is included as part of the daytime period. Noise contours developed using CNEL and Ldn procedures will normally agree within one dB(A), which is an insignificant difference. The Ldn is a computational simplification of the CNEL.

## 3.2 NOISE SENSITIVE AREAS

The following noise sensitive land uses have been identified in the County:

- Residential areas
- Schools
- Convalescent and acute care hospitals
- Parks and recreational areas
- Churches

### Goals

1) Ensure that residents of Kern County are protected from excessive noise and that moderate levels of noise are maintained.

2) Protect the economic base of Kern County by preventing the encroachment of incompatible land uses near known noise producing roadways, industries, railroads, airports, oil and gas extraction, and other sources.

### Policies

1) Review discretionary industrial, commercial, or other noise-generating land use projects for compatibility with nearby noise-sensitive land uses.

2) Require noise level criteria applied to all categories of land uses to be consistent with the recommendations of the California Division of Occupational Safety and Health (DOSH).

3) Encourage vegetation and landscaping along roadways and adjacent to other noise sources in order to increase absorption of noise.

4) Utilize good land use planning principles to reduce conflicts related to noise emissions.

5) Prohibit new noise-sensitive land uses in noise-impacted areas unless effective mitigation measures are incorporated into the project design. Such mitigation shall be designed to reduce noise to the following levels:

   a) 65 dB $L_{dn}$ or less in outdoor activity areas;
   b) 45 dB $L_{dn}$ or less within interior living spaces or other noise sensitive interior spaces.

6) Ensure that new development in the vicinity of airports will be compatible with existing and projected airport noise levels as set forth in the ALUCP.

7) Employ the best available methods of noise control.

8) Enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code concerning the construction of new multiple-occupancy dwellings such as hotels, apartments, and condominiums.

**Implementation Measures**

The following are programs to be carried out by the Kern County to implement the goals and policies of the Noise Element.

A) Utilize zoning regulations to assist in achieving noise-compatible land use patterns.

B) Require proper acoustical treatment of transportation facilities, including highways, airports, and railroads.

C) Review discretionary development plans, programs and proposals, including those initiated by both the public and private sectors, to ascertain and ensure their conformance to the policies outlined in this element.

D) Review discretionary development plans for proposed residential or other noise sensitive land uses in noise-impacted areas to ensure their conformance with the noise standards of 65 dB $L_{dn}$ or less in outdoor activity areas and 45 dB $L_{dn}$ or less within interior living spaces.

E) Review discretionary development plans to ensure compatibility with adopted Airport Land Use Compatibility Plans.

F) Require proposed commercial and industrial uses or operations to be designed or arranged so that they will not subject residential or other noise sensitive land uses to exterior noise levels in excess of 65 dB $L_{dn}$ and interior noise levels in excess of 45 dB $L_{dn}$.

G) At the time of any discretionary approval, such as a request for a General Plan Amendment, zone change or subdivision, the developer may be required to submit an acoustical report indicating the means by which the developer proposes to comply with the noise standards. The acoustical report shall:

   a) Be the responsibility of the applicant.

b) Be prepared by a qualified acoustical consultant experienced in the fields of environmental noise assessment and architectural acoustics.

c) Be subject to the review and approval of the Kern County Planning Department and the Environmental Health Services Department. All recommendations therein shall be complied with prior to final approval of the project.

H) Encourage cooperation between the County and the incorporated cities within the County to control noise.

I) Noise analyses shall include recommended mitigation, if required, and shall:

a) Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.
b) Include estimated noise levels, in terms of CNEL, for existing and projected future (10 – 20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element.
c) Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element.
d) Include estimates of noise exposure after the prescribed mitigation measures have been implemented. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a rationale for acceptance of the project must be provided.

J) Develop implementation procedures to ensure that requirements imposed pursuant to the findings of an acoustical analysis are conducted as part of the project permitting process.

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# APPENDIX 3.2:

# KERN COUNTY CODE OF ORDINANCES - CHAPTER 8.36

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# Chapter 8.36 NOISE CONTROL

## 8.36.010 Definitions.

As used in this chapter, the following words and phrases shall be defined and have the meaning ascribed to them as follows:

A. "Person" means and includes any individual, group of individuals, club, association, partnership or corporation.

B. "Loud and raucous noise" means any sound created and/or transmitted in any manner whatever which is of such volume, intensity or carrying power as to interfere with or disturb the reasonable and quiet comfortable enjoyment of life or property or which is adverse to the general public welfare in any neighborhood.

C. "Public address system" or "sound equipment" means any mechanical and/or electrical device for the reproduction, amplification or broadcasting of the human voice, music, or any other sound whatsoever.

D. "Permanent building" shall expressly be deemed to exclude any structure with outer walls or roof composed, in whole or in part, of canvas or similar materials, and any structure commonly described as an "open air pavilion."

E. "Broadcast" means any voice, music, or any sound whatever transmitted, amplified, reproduced or otherwise emitted from any public address system.

F. "Construction" means any activity associated with a project or work for which a permit may be required under the Kern County Code of Building Regulations.

G. "Construction site" is any parcel on which the construction is occurring.

H. "Emergency work" means work to restore property to a safe condition following a calamity, work required to protect persons or property from exposure to danger, or work by private or public utilities to restoring utility services.

(Ord. G-7577 § 2, 2007; Ord. G-6301 § 2, 1996; prior code § 6350)

## 8.36.020 Prohibited sounds.

It is unlawful for any person to do, or cause to be done, any of the following acts within the unincorporated areas of the county:

A. Operate any public address system in any event when the sound emanating therefrom can be heard beyond the confines of any permanent building to such degree that such sound constitutes a loud and raucous noise;

B. Operate upon any public street or highway any vehicle equipped with and operating any public address system when such operation constitutes a traffic hazard or interferes with the safe and orderly flow of traffic over and along any such public street or highway;

C. In any manner whatever willfully make, emit or transmit any loud or raucous noise upon or from any public street or highway or upon or from any public park or any public property whatever;

D. Operate any public address system when the sound emanating therefrom can be heard beyond the confines of a permanent building when such operation constitutes the promotion or advertisement of any private affair or business or commercial enterprise;

E. Operate any public address system when the sound emanating therefrom can be heard beyond the confines of a permanent building when such operation is for purposes other than the promotion or advertisement of any private affair or business or commercial enterprise unless such operation shall first be declared as hereinafter provided;

F. The provisions of subsection (D) of this section shall not prohibit the incidental sounding, between the hours of nine (9:00) a.m. and nine (9:00) p.m. of any day, of a musical sound apparatus consisting of bells or the sounding of a bell or horn when the sound thereof is not audible to a person of average hearing faculties or capacity at a distance of one hundred fifty (150) feet, when such incidental sounding is in connection with the ordinary use and operation of a tradesman's, peddler's, or huckster's cart, wagon or other vehicle; provided, however, that no such sounding in any event shall be permitted between the hours of nine (9:00) p.m. of any day and nine (9:00) a.m. of the following day;

G. Operate or permit to be operated any public address system or sound equipment so as to be audible to a person of average hearing faculties or capacity at a distance of:

1. One hundred fifty (150) feet from the public address system or sound equipment, if operated on a public street, sidewalk or any other public property; or

2. If operated elsewhere, one hundred fifty (150) feet from the property line of the property on which the public address system or sound equipment is located; or

3. Between the hours of eight (8:00) a.m. and midnight (12:00) a.m., one thousand (1,000) feet from the public address system or sound equipment connected with either short-term events held on public property with the consent of the responsible public agency, short-term public events held historically and regularly, or short-term events authorized by any kind of permit or license issued by the county. This subsection shall not apply to acts proscribed by Section 27007 of the California Vehicle Code, as amended from time to time.

H. Create noise from construction, between the hours of nine (9:00) p.m. and six (6:00) a.m. on weekdays and nine (9:00) p.m. and eight (8:00) a.m. on weekends, which is audible to a person with average hearing faculties or capacity at a distance of one hundred fifty (150) feet from the construction site, if the construction site is within one thousand (1,000) feet of an occupied residential dwelling except as provided below:

1. The development services agency director or his designated representative may for good cause exempt some construction work for a limited time.

2. Emergency work is exempt from this section.

(Ord. G-7577 § 3, 2007; Ord. G-6301 §§ 4, 5, 1996; prior code § 6351)

(Ord. No. G-8035, § 25, 4-20-10; Ord. No. G-8911, § 2, 2-25-20)

## 8.36.030 Violation of chapter.

A violation of any provision of this title is guilty of a misdemeanor.

(Ord. G-7577 § 4, 2007)

# APPENDIX 5.1:

# STUDY AREA PHOTOS

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# JN: 13533 Study Area Photos



**L1_E**
**34, 56' 9.120000"118, 13' 20.080000"**



**L1_N**
**34, 56' 9.120000"118, 13' 20.110000"**



**L1_S**
**34, 56' 9.140000"118, 13' 20.110000"**



**L1_W**
**34, 56' 9.160000"118, 13' 20.020000"**



**L2_E**
**34, 56' 3.990000"118, 12' 55.170000"**



**L2_N**
**34, 56' 3.960000"118, 12' 55.200000"**

# JN: 13533 Study Area Photos



**L2_S**
**34, 56' 3.990000"118, 12' 55.170000"**



**L2_W**
**34, 56' 3.990000"118, 12' 55.220000"**



**L3_E**
**34, 55' 57.220000"118, 12' 42.700000"**



**L3_N**
**34, 55' 57.110000"118, 12' 42.730000"**



**L3_S**
**34, 55' 57.120000"118, 12' 42.730000"**



**L3_W**
**34, 55' 57.230000"118, 12' 42.700000"**

# JN: 13533 Study Area Photos



**L4_E**
**34, 55' 38.950000"118, 12' 42.180000"**



**L4_N**
**34, 55' 38.950000"118, 12' 42.180000"**



**L4_S**
**34, 55' 38.950000"118, 12' 42.180000"**



**L4_W**
**34, 55' 38.950000"118, 12' 42.180000"**



**L5_E**
**34, 55' 34.350000"118, 12' 42.700000"**



**L5_N**
**34, 55' 34.380000"118, 12' 42.700000"**

# JN: 13533 Study Area Photos



**L5_S**
**34, 55' 34.380000"118, 12' 42.700000"**



**L5_W**
**34, 55' 34.350000"118, 12' 42.730000"**



**L6_E**
**34, 55' 33.660000"118, 12' 47.750000"**



**L6_N**
**34, 55' 33.660000"118, 12' 47.670000"**



**L6_S**
**34, 55' 33.660000"118, 12' 47.720000"**



**L6_W**
**34, 55' 33.680000"118, 12' 47.750000"**

# APPENDIX 5.2:

# NOISE LEVEL MEASUREMENT WORKSHEETS

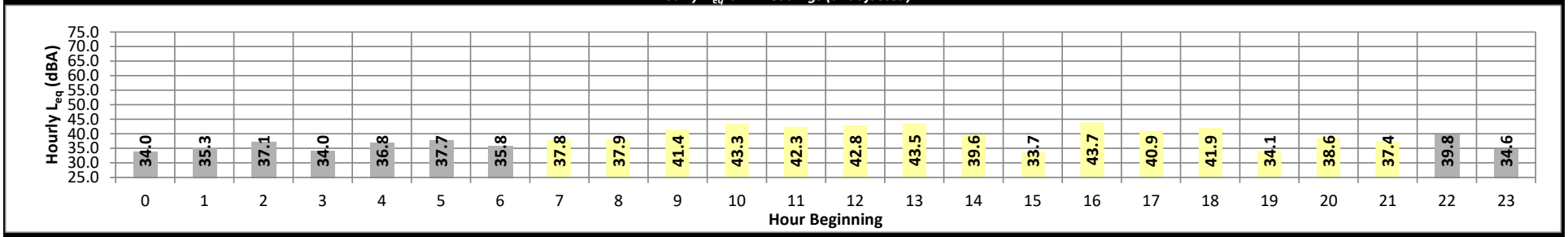
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## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L1 - Located north of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 5146 Montiverde Road. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 34.0 | 37.4 | 32.8 | 37.0 | 36.6 | 35.7 | 35.2 | 34.2 | 33.6 | 33.1 | 33.0 | 32.9 | 34.0 | 10.0 | 44.0 |
| | 1 | 35.3 | 42.3 | 32.8 | 41.2 | 40.3 | 38.7 | 37.9 | 35.4 | 34.1 | 33.1 | 33.0 | 32.8 | 35.3 | 10.0 | 45.3 |
| | 2 | 37.1 | 44.4 | 33.6 | 43.4 | 42.5 | 41.3 | 40.4 | 37.5 | 35.7 | 34.0 | 33.9 | 33.7 | 37.1 | 10.0 | 47.1 |
| | 3 | 34.0 | 43.9 | 32.3 | 41.8 | 39.9 | 37.1 | 35.5 | 33.4 | 32.9 | 32.5 | 32.5 | 32.4 | 34.0 | 10.0 | 44.0 |
| | 4 | 36.8 | 49.7 | 33.3 | 47.5 | 45.3 | 40.9 | 38.6 | 35.5 | 34.5 | 33.6 | 33.5 | 33.3 | 36.8 | 10.0 | 46.8 |
| | 5 | 37.7 | 43.4 | 35.0 | 43.1 | 42.6 | 41.5 | 40.0 | 38.1 | 36.8 | 35.6 | 35.3 | 35.1 | 37.7 | 10.0 | 47.7 |
| | 6 | 35.8 | 38.9 | 34.4 | 38.6 | 38.3 | 37.6 | 37.1 | 36.2 | 35.6 | 34.7 | 34.6 | 34.4 | 35.8 | 10.0 | 45.8 |
| Day | 7 | 37.8 | 43.7 | 35.5 | 43.0 | 42.4 | 41.1 | 40.2 | 38.0 | 36.9 | 35.9 | 35.8 | 35.6 | 37.8 | 0.0 | 37.8 |
| | 8 | 37.9 | 43.6 | 34.8 | 43.0 | 42.3 | 41.0 | 40.4 | 38.5 | 37.0 | 35.6 | 35.3 | 35.0 | 37.9 | 0.0 | 37.9 |
| | 9 | 41.4 | 49.0 | 35.0 | 48.7 | 48.2 | 47.2 | 46.1 | 41.1 | 39.0 | 36.0 | 35.6 | 35.2 | 41.4 | 0.0 | 41.4 |
| | 10 | 43.3 | 49.3 | 37.1 | 49.0 | 48.7 | 47.0 | 46.5 | 44.5 | 42.5 | 38.5 | 37.9 | 37.2 | 43.3 | 0.0 | 43.3 |
| | 11 | 42.3 | 50.3 | 34.6 | 49.8 | 49.1 | 47.7 | 47.2 | 42.6 | 39.5 | 36.0 | 35.5 | 34.8 | 42.3 | 0.0 | 42.3 |
| | 12 | 42.8 | 49.3 | 35.6 | 48.9 | 48.5 | 47.3 | 46.4 | 43.9 | 41.3 | 37.3 | 36.6 | 35.9 | 42.8 | 0.0 | 42.8 |
| | 13 | 43.5 | 51.4 | 35.4 | 50.9 | 50.1 | 48.5 | 47.4 | 44.4 | 41.5 | 37.5 | 36.7 | 35.7 | 43.5 | 0.0 | 43.5 |
| | 14 | 39.6 | 47.4 | 34.3 | 46.7 | 46.0 | 44.5 | 43.4 | 40.2 | 37.7 | 35.2 | 34.8 | 34.4 | 39.6 | 0.0 | 39.6 |
| | 15 | 33.7 | 37.5 | 32.0 | 37.1 | 36.7 | 36.0 | 35.6 | 34.3 | 33.2 | 32.2 | 32.1 | 32.0 | 33.7 | 0.0 | 33.7 |
| | 16 | 43.7 | 50.5 | 34.9 | 50.1 | 49.8 | 48.9 | 48.2 | 45.7 | 41.2 | 36.4 | 35.7 | 35.0 | 43.7 | 0.0 | 43.7 |
| | 17 | 40.9 | 48.4 | 35.2 | 47.9 | 47.3 | 45.7 | 44.5 | 41.6 | 39.3 | 36.1 | 35.7 | 35.3 | 40.9 | 0.0 | 40.9 |
| | 18 | 41.9 | 48.9 | 36.0 | 48.7 | 48.4 | 47.4 | 46.7 | 42.4 | 39.0 | 36.7 | 36.4 | 36.1 | 41.9 | 0.0 | 41.9 |
| | 19 | 34.1 | 36.9 | 32.8 | 36.6 | 36.3 | 35.7 | 35.4 | 34.4 | 33.9 | 33.1 | 33.0 | 32.9 | 34.1 | 5.0 | 39.1 |
| | 20 | 38.6 | 44.0 | 33.4 | 43.5 | 43.2 | 42.3 | 41.7 | 39.6 | 37.8 | 34.6 | 34.0 | 33.5 | 38.6 | 5.0 | 43.6 |
| | 21 | 37.4 | 44.0 | 33.7 | 43.7 | 43.2 | 42.3 | 41.3 | 37.4 | 35.6 | 34.1 | 34.0 | 33.8 | 37.4 | 5.0 | 42.4 |
| Night | 22 | 39.8 | 57.2 | 42.4 | 56.7 | 56.4 | 54.5 | 53.6 | 51.2 | 48.9 | 44.8 | 43.8 | 42.7 | 39.8 | 10.0 | 49.8 |
| | 23 | 34.6 | 40.0 | 32.7 | 39.2 | 38.4 | 37.1 | 36.6 | 35.0 | 34.0 | 33.0 | 32.9 | 32.8 | 34.6 | 10.0 | 44.6 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 33.7 | 36.9 | 32.0 | 36.6 | 36.3 | 35.7 | 35.4 | 34.3 | 33.2 | 32.2 | 32.1 | 32.0 |
| | Max | 43.7 | 51.4 | 37.1 | 50.9 | 50.1 | 48.9 | 48.2 | 45.7 | 42.5 | 38.5 | 37.9 | 37.2 |
| Energy Average | | 40.9 | Average: | | 45.8 | 45.3 | 44.2 | 43.4 | 40.6 | 38.4 | 35.7 | 35.3 | 34.8 |
| Night | Min | 34.0 | 37.4 | 32.3 | 37.0 | 36.6 | 35.7 | 35.2 | 33.4 | 32.9 | 32.5 | 32.5 | 32.4 |
| | Max | 39.8 | 57.2 | 42.4 | 56.7 | 56.4 | 54.5 | 53.6 | 51.2 | 48.9 | 44.8 | 43.8 | 42.7 |
| Energy Average | | 36.5 | Average: | | 43.2 | 42.3 | 40.5 | 39.4 | 37.4 | 36.2 | 34.9 | 34.7 | 34.5 |

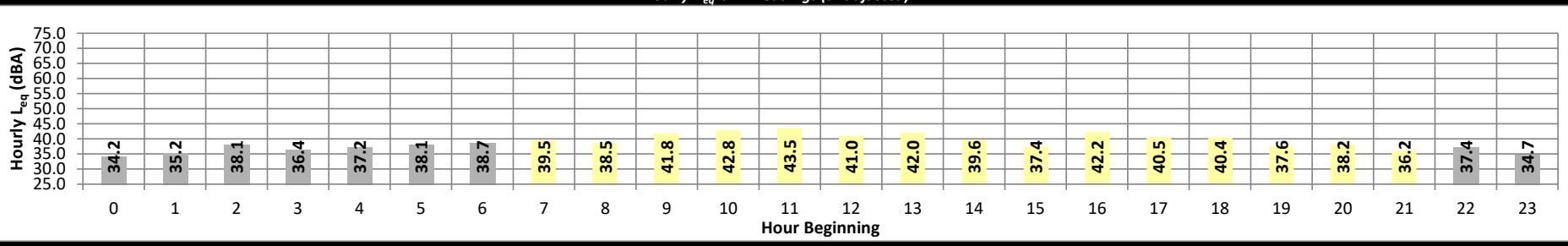
| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| **44.1** | **40.9** | **36.5** |

## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L2 - Located north of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 4701 Sunbow Avenue. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 34.2 | 38.2 | 32.9 | 37.8 | 37.4 | 36.3 | 35.9 | 34.4 | 33.7 | 33.1 | 33.0 | 32.9 | 34.2 | 10.0 | 44.2 |
| | 1 | 35.2 | 41.2 | 33.1 | 40.0 | 39.0 | 37.8 | 37.1 | 35.5 | 34.5 | 33.5 | 33.4 | 33.2 | 35.2 | 10.0 | 45.2 |
| | 2 | 38.1 | 45.6 | 34.6 | 44.5 | 43.5 | 41.6 | 40.7 | 38.4 | 37.0 | 35.4 | 35.1 | 34.8 | 38.1 | 10.0 | 48.1 |
| | 3 | 36.4 | 45.4 | 33.4 | 43.5 | 42.1 | 39.7 | 38.6 | 36.6 | 35.2 | 34.0 | 33.8 | 33.5 | 36.4 | 10.0 | 46.4 |
| | 4 | 37.2 | 44.9 | 34.3 | 43.3 | 42.0 | 40.3 | 39.5 | 37.5 | 36.3 | 35.0 | 34.8 | 34.5 | 37.2 | 10.0 | 47.2 |
| | 5 | 38.1 | 44.6 | 34.8 | 44.2 | 43.7 | 42.2 | 41.3 | 38.5 | 36.5 | 35.2 | 35.1 | 34.9 | 38.1 | 10.0 | 48.1 |
| | 6 | 38.7 | 44.8 | 34.8 | 44.0 | 43.6 | 42.5 | 41.7 | 39.3 | 37.7 | 35.6 | 35.3 | 35.0 | 38.7 | 10.0 | 48.7 |
| Day | 7 | 39.5 | 48.1 | 35.6 | 47.6 | 46.9 | 45.0 | 43.1 | 39.1 | 37.3 | 36.0 | 35.9 | 35.7 | 39.5 | 0.0 | 39.5 |
| | 8 | 38.5 | 47.9 | 34.9 | 47.1 | 46.0 | 43.0 | 41.6 | 38.0 | 36.8 | 35.4 | 35.2 | 34.9 | 38.5 | 0.0 | 38.5 |
| | 9 | 41.8 | 47.0 | 37.6 | 46.7 | 46.4 | 45.6 | 45.1 | 42.6 | 40.6 | 38.8 | 38.5 | 37.7 | 41.8 | 0.0 | 41.8 |
| | 10 | 42.8 | 49.7 | 36.8 | 49.2 | 48.6 | 46.8 | 46.0 | 43.7 | 41.8 | 38.3 | 37.9 | 37.0 | 42.8 | 0.0 | 42.8 |
| | 11 | 43.5 | 50.6 | 35.7 | 50.1 | 49.6 | 48.4 | 47.7 | 44.8 | 41.2 | 36.9 | 36.4 | 35.9 | 43.5 | 0.0 | 43.5 |
| | 12 | 41.0 | 48.1 | 34.9 | 47.7 | 47.2 | 45.8 | 44.7 | 41.6 | 39.3 | 36.0 | 35.5 | 35.1 | 41.0 | 0.0 | 41.0 |
| | 13 | 42.0 | 50.2 | 35.0 | 49.7 | 49.1 | 47.8 | 46.8 | 42.1 | 39.3 | 36.1 | 35.6 | 35.2 | 42.0 | 0.0 | 42.0 |
| | 14 | 39.6 | 47.7 | 34.5 | 47.2 | 46.5 | 44.9 | 43.6 | 39.7 | 37.6 | 35.2 | 34.9 | 34.6 | 39.6 | 0.0 | 39.6 |
| | 15 | 37.4 | 45.3 | 33.0 | 44.8 | 44.3 | 42.8 | 41.2 | 37.6 | 35.6 | 33.6 | 33.3 | 33.1 | 37.4 | 0.0 | 37.4 |
| | 16 | 42.2 | 48.8 | 34.6 | 48.5 | 48.1 | 47.1 | 46.5 | 43.5 | 39.9 | 35.5 | 35.1 | 34.7 | 42.2 | 0.0 | 42.2 |
| | 17 | 40.5 | 47.2 | 35.5 | 46.8 | 46.2 | 44.9 | 44.0 | 41.4 | 39.0 | 36.4 | 36.0 | 35.7 | 40.5 | 0.0 | 40.5 |
| | 18 | 40.4 | 47.5 | 36.0 | 47.2 | 46.6 | 45.1 | 43.9 | 40.8 | 38.8 | 36.7 | 36.4 | 36.1 | 40.4 | 0.0 | 40.4 |
| | 19 | 37.6 | 44.0 | 33.0 | 43.4 | 42.7 | 41.8 | 41.2 | 38.8 | 36.0 | 33.3 | 33.2 | 33.1 | 37.6 | 5.0 | 42.6 |
| | 20 | 38.2 | 44.0 | 33.7 | 43.7 | 43.3 | 42.1 | 41.4 | 39.2 | 37.0 | 34.4 | 34.1 | 33.8 | 38.2 | 5.0 | 43.2 |
| | 21 | 36.2 | 40.9 | 33.7 | 40.3 | 40.0 | 39.1 | 38.5 | 36.7 | 35.5 | 34.2 | 34.0 | 33.8 | 36.2 | 5.0 | 41.2 |
| Night | 22 | 37.4 | 57.9 | 43.2 | 57.5 | 57.1 | 55.9 | 55.1 | 52.6 | 49.9 | 46.3 | 45.0 | 43.6 | 37.4 | 10.0 | 47.4 |
| | 23 | 34.7 | 39.5 | 32.9 | 39.0 | 38.5 | 37.4 | 36.8 | 34.9 | 34.0 | 33.2 | 33.1 | 33.0 | 34.7 | 10.0 | 44.7 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 36.2 | 40.9 | 33.0 | 40.3 | 40.0 | 39.1 | 38.5 | 36.7 | 35.5 | 33.3 | 33.2 | 33.1 |
| | Max | 43.5 | 50.6 | 37.6 | 50.1 | 49.6 | 48.4 | 47.7 | 44.8 | 41.8 | 38.8 | 38.5 | 37.7 |
| Energy Average | | 40.6 | Average: | | 46.7 | 46.1 | 44.7 | 43.7 | 40.6 | 38.4 | 35.8 | 35.5 | 35.1 |
| Night | Min | 34.2 | 38.2 | 32.9 | 37.8 | 37.4 | 36.3 | 35.9 | 34.4 | 33.7 | 33.1 | 33.0 | 32.9 |
| | Max | 38.7 | 57.9 | 43.2 | 57.5 | 57.1 | 55.9 | 55.1 | 52.6 | 49.9 | 46.3 | 45.0 | 43.6 |
| Energy Average | | 36.9 | Average: | | 43.8 | 43.0 | 41.5 | 40.7 | 38.6 | 37.2 | 35.7 | 35.4 | 35.0 |

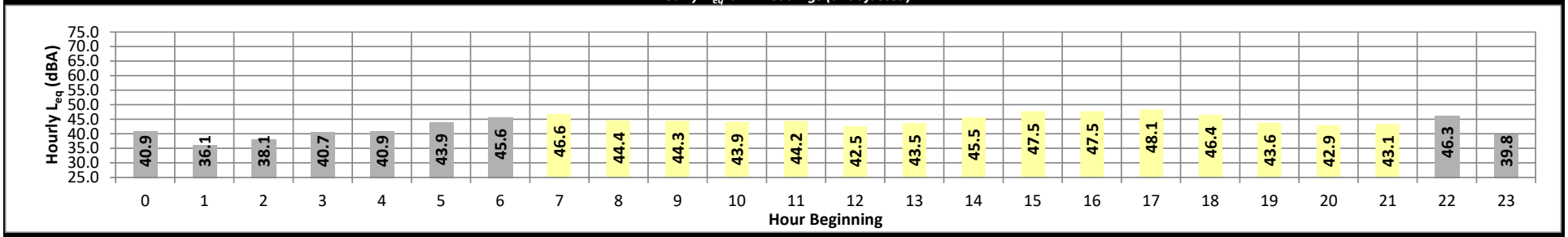
| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| 44.3 | 40.6 | 36.9 |

## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L3 - Located northeast of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 4488 Gayiety Avenue. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 40.9 | 50.8 | 32.9 | 50.4 | 50.1 | 49.1 | 47.0 | 38.2 | 34.5 | 33.3 | 33.2 | 33.0 | 40.9 | 10.0 | 50.9 |
| | 1 | 36.1 | 44.5 | 32.4 | 44.2 | 43.6 | 42.0 | 40.3 | 35.1 | 33.5 | 32.6 | 32.6 | 32.5 | 36.1 | 10.0 | 46.1 |
| | 2 | 38.1 | 47.5 | 33.0 | 46.9 | 46.3 | 44.8 | 43.1 | 36.6 | 34.1 | 33.3 | 33.2 | 33.1 | 38.1 | 10.0 | 48.1 |
| | 3 | 40.7 | 50.7 | 32.2 | 50.1 | 49.5 | 47.7 | 47.1 | 39.5 | 35.8 | 32.7 | 32.4 | 32.3 | 40.7 | 10.0 | 50.7 |
| | 4 | 40.9 | 51.0 | 33.0 | 50.7 | 50.3 | 48.9 | 46.9 | 38.1 | 34.8 | 33.3 | 33.2 | 33.1 | 40.9 | 10.0 | 50.9 |
| | 5 | 43.9 | 53.6 | 35.7 | 53.1 | 52.6 | 51.1 | 49.4 | 43.1 | 39.1 | 36.5 | 36.2 | 35.9 | 43.9 | 10.0 | 53.9 |
| | 6 | 45.6 | 54.2 | 35.3 | 53.8 | 53.2 | 51.9 | 50.9 | 46.5 | 41.5 | 36.1 | 35.7 | 35.4 | 45.6 | 10.0 | 55.6 |
| Day | 7 | 46.6 | 56.4 | 36.1 | 56.0 | 55.5 | 54.0 | 52.1 | 45.8 | 40.8 | 37.2 | 36.8 | 36.3 | 46.6 | 0.0 | 46.6 |
| | 8 | 44.4 | 53.1 | 35.2 | 52.7 | 52.3 | 51.3 | 50.1 | 44.4 | 39.6 | 36.1 | 35.7 | 35.3 | 44.4 | 0.0 | 44.4 |
| | 9 | 44.3 | 53.4 | 34.8 | 53.1 | 52.7 | 51.3 | 49.8 | 43.4 | 39.8 | 36.3 | 35.7 | 35.0 | 44.3 | 0.0 | 44.3 |
| | 10 | 43.9 | 53.3 | 39.2 | 52.9 | 52.4 | 50.9 | 49.6 | 45.7 | 43.5 | 40.7 | 40.0 | 39.4 | 43.9 | 0.0 | 43.9 |
| | 11 | 44.2 | 54.2 | 34.0 | 53.8 | 53.2 | 51.2 | 49.2 | 43.8 | 39.0 | 35.2 | 34.7 | 34.2 | 44.2 | 0.0 | 44.2 |
| | 12 | 42.5 | 52.3 | 33.8 | 51.8 | 51.3 | 49.1 | 47.4 | 41.8 | 38.3 | 35.1 | 34.5 | 33.9 | 42.5 | 0.0 | 42.5 |
| | 13 | 43.5 | 52.8 | 33.3 | 52.5 | 52.0 | 50.5 | 48.8 | 43.5 | 38.5 | 34.4 | 33.9 | 33.5 | 43.5 | 0.0 | 43.5 |
| | 14 | 45.5 | 54.3 | 34.4 | 54.0 | 53.6 | 52.6 | 51.6 | 45.3 | 39.9 | 35.4 | 35.0 | 34.5 | 45.5 | 0.0 | 45.5 |
| | 15 | 47.5 | 65.2 | 41.6 | 64.8 | 64.5 | 63.1 | 60.8 | 50.1 | 45.6 | 42.9 | 42.4 | 41.8 | 47.5 | 0.0 | 47.5 |
| | 16 | 47.5 | 67.4 | 38.7 | 66.7 | 65.3 | 60.6 | 58.0 | 50.4 | 44.0 | 40.2 | 39.5 | 38.9 | 47.5 | 0.0 | 47.5 |
| | 17 | 48.1 | 57.5 | 36.8 | 57.1 | 56.6 | 55.2 | 53.8 | 47.6 | 42.2 | 38.0 | 37.4 | 36.9 | 48.1 | 0.0 | 48.1 |
| | 18 | 46.4 | 55.1 | 36.6 | 54.8 | 54.5 | 53.5 | 52.2 | 46.1 | 40.9 | 37.5 | 37.1 | 36.7 | 46.4 | 0.0 | 46.4 |
| | 19 | 43.6 | 53.4 | 33.2 | 52.8 | 52.3 | 51.1 | 49.6 | 43.3 | 37.7 | 33.6 | 33.4 | 33.2 | 43.6 | 5.0 | 48.6 |
| | 20 | 42.9 | 62.1 | 39.5 | 61.5 | 60.8 | 58.2 | 56.6 | 49.2 | 44.8 | 40.9 | 40.3 | 39.9 | 42.9 | 5.0 | 47.9 |
| | 21 | 43.1 | 52.3 | 33.9 | 52.0 | 51.5 | 50.4 | 49.3 | 42.4 | 37.2 | 34.5 | 34.2 | 34.0 | 43.1 | 5.0 | 48.1 |
| Night | 22 | 46.3 | 59.7 | 43.8 | 59.3 | 58.6 | 57.4 | 56.5 | 53.4 | 50.0 | 45.1 | 44.5 | 44.0 | 46.3 | 10.0 | 56.3 |
| | 23 | 39.8 | 48.9 | 32.6 | 48.6 | 48.3 | 47.5 | 45.9 | 38.6 | 33.8 | 32.8 | 32.8 | 32.7 | 39.8 | 10.0 | 49.8 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 42.5 | 52.3 | 33.2 | 51.8 | 51.3 | 49.1 | 47.4 | 41.8 | 37.2 | 33.6 | 33.4 | 33.2 |
| | Max | 48.1 | 67.4 | 41.6 | 66.7 | 65.3 | 63.1 | 60.8 | 50.4 | 45.6 | 42.9 | 42.4 | 41.8 |
| Energy Average | | 45.3 | Average: | | 55.8 | 55.2 | 53.5 | 51.9 | 45.5 | 40.8 | 37.2 | 36.7 | 36.2 |
| Night | Min | 36.1 | 44.5 | 32.2 | 44.2 | 43.6 | 42.0 | 40.3 | 35.1 | 33.5 | 32.6 | 32.4 | 32.3 |
| | Max | 46.3 | 59.7 | 43.8 | 59.3 | 58.6 | 57.4 | 56.5 | 53.4 | 50.0 | 45.1 | 44.5 | 44.0 |
| Energy Average | | 42.5 | Average: | | 50.8 | 50.3 | 49.0 | 47.4 | 41.0 | 37.5 | 35.1 | 34.9 | 34.7 |

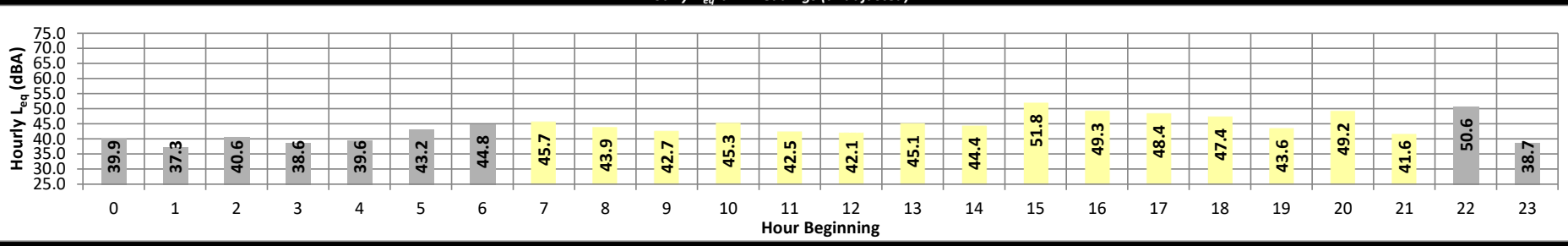
| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| 49.7 | 45.3 | 42.5 |

## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L4 - Located northeast of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 7494 Mojave-Tropico Road. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 39.9 | 49.7 | 32.6 | 49.4 | 49.0 | 47.5 | 45.7 | 38.0 | 34.3 | 32.9 | 32.8 | 32.7 | 39.9 | 10.0 | 49.9 |
| | 1 | 37.3 | 45.5 | 32.6 | 44.9 | 44.3 | 42.9 | 41.8 | 37.1 | 34.4 | 33.0 | 32.8 | 32.7 | 37.3 | 10.0 | 47.3 |
| | 2 | 40.6 | 48.9 | 34.2 | 48.2 | 47.6 | 46.3 | 45.0 | 40.7 | 38.3 | 35.2 | 34.8 | 34.4 | 40.6 | 10.0 | 50.6 |
| | 3 | 38.6 | 47.2 | 31.9 | 46.8 | 46.6 | 45.9 | 44.7 | 37.8 | 33.8 | 32.2 | 32.1 | 32.0 | 38.6 | 10.0 | 48.6 |
| | 4 | 39.6 | 49.6 | 33.0 | 49.0 | 48.7 | 46.9 | 45.0 | 37.6 | 34.1 | 33.3 | 33.2 | 33.1 | 39.6 | 10.0 | 49.6 |
| | 5 | 43.2 | 52.2 | 34.8 | 51.9 | 51.6 | 50.4 | 48.7 | 43.0 | 37.7 | 35.4 | 35.2 | 34.9 | 43.2 | 10.0 | 53.2 |
| | 6 | 44.8 | 53.4 | 34.4 | 53.2 | 52.9 | 51.5 | 50.4 | 45.3 | 39.7 | 35.1 | 34.9 | 34.5 | 44.8 | 10.0 | 54.8 |
| Day | 7 | 45.7 | 54.6 | 35.9 | 54.2 | 53.7 | 52.5 | 51.3 | 45.9 | 40.3 | 36.5 | 36.2 | 36.0 | 45.7 | 0.0 | 45.7 |
| | 8 | 43.9 | 52.6 | 35.3 | 52.3 | 52.0 | 50.7 | 49.5 | 44.0 | 38.6 | 36.1 | 35.8 | 35.5 | 43.9 | 0.0 | 43.9 |
| | 9 | 42.7 | 51.6 | 34.9 | 51.3 | 50.9 | 49.6 | 48.0 | 42.2 | 38.6 | 35.8 | 35.3 | 35.0 | 42.7 | 0.0 | 42.7 |
| | 10 | 45.3 | 54.7 | 37.1 | 54.2 | 53.2 | 50.7 | 48.7 | 45.8 | 43.1 | 38.7 | 38.2 | 37.3 | 45.3 | 0.0 | 45.3 |
| | 11 | 42.5 | 51.8 | 33.4 | 51.3 | 50.5 | 48.8 | 47.7 | 42.7 | 38.6 | 34.4 | 33.9 | 33.5 | 42.5 | 0.0 | 42.5 |
| | 12 | 42.1 | 51.4 | 34.0 | 51.2 | 50.9 | 49.1 | 46.9 | 40.9 | 38.1 | 35.0 | 34.6 | 34.1 | 42.1 | 0.0 | 42.1 |
| | 13 | 45.1 | 57.8 | 34.3 | 56.5 | 55.0 | 51.7 | 49.3 | 43.4 | 40.0 | 36.2 | 35.5 | 34.7 | 45.1 | 0.0 | 45.1 |
| | 14 | 44.4 | 53.2 | 34.2 | 52.7 | 52.2 | 51.1 | 50.0 | 44.4 | 40.0 | 35.5 | 34.9 | 34.4 | 44.4 | 0.0 | 44.4 |
| | 15 | 51.8 | 62.7 | 33.6 | 62.3 | 62.2 | 60.3 | 58.2 | 49.2 | 41.3 | 34.7 | 34.2 | 33.7 | 51.8 | 0.0 | 51.8 |
| | 16 | 49.3 | 58.7 | 33.9 | 58.4 | 58.1 | 57.4 | 55.9 | 47.4 | 41.9 | 35.5 | 34.8 | 34.1 | 49.3 | 0.0 | 49.3 |
| | 17 | 48.4 | 57.1 | 37.3 | 56.7 | 56.4 | 55.3 | 54.0 | 48.7 | 43.9 | 38.8 | 38.1 | 37.5 | 48.4 | 0.0 | 48.4 |
| | 18 | 47.4 | 55.7 | 38.1 | 55.4 | 55.0 | 53.9 | 52.7 | 47.7 | 43.4 | 39.3 | 38.8 | 38.2 | 47.4 | 0.0 | 47.4 |
| | 19 | 43.6 | 53.0 | 33.3 | 52.7 | 52.3 | 50.9 | 48.9 | 43.3 | 38.6 | 33.9 | 33.6 | 33.4 | 43.6 | 5.0 | 48.6 |
| | 20 | 49.2 | 59.5 | 34.6 | 59.3 | 59.1 | 57.9 | 56.2 | 45.1 | 40.4 | 35.5 | 35.0 | 34.7 | 49.2 | 5.0 | 54.2 |
| | 21 | 41.6 | 51.3 | 33.3 | 50.9 | 50.4 | 48.5 | 46.9 | 41.1 | 37.1 | 33.8 | 33.7 | 33.4 | 41.6 | 5.0 | 46.6 |
| Night | 22 | 50.6 | 58.7 | 43.2 | 58.2 | 57.6 | 56.3 | 54.8 | 50.8 | 48.3 | 44.9 | 44.5 | 43.5 | 50.6 | 10.0 | 60.6 |
| | 23 | 38.7 | 48.0 | 32.2 | 47.7 | 47.1 | 45.8 | 44.4 | 36.8 | 34.2 | 32.5 | 32.4 | 32.3 | 38.7 | 10.0 | 48.7 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 41.6 | 51.3 | 33.3 | 50.9 | 50.4 | 48.5 | 46.9 | 40.9 | 37.1 | 33.8 | 33.6 | 33.4 |
| | Max | 51.8 | 62.7 | 38.1 | 62.3 | 62.2 | 60.3 | 58.2 | 49.2 | 43.9 | 39.3 | 38.8 | 38.2 |
| Energy Average | | 46.6 | Average: | | 54.6 | 54.1 | 52.6 | 50.9 | 44.8 | 40.3 | 36.0 | 35.5 | 35.0 |
| Night | Min | 37.3 | 45.5 | 31.9 | 44.9 | 44.3 | 42.9 | 41.8 | 36.8 | 33.8 | 32.2 | 32.1 | 32.0 |
| | Max | 50.6 | 58.7 | 43.2 | 58.2 | 57.6 | 56.3 | 54.8 | 50.8 | 48.3 | 44.9 | 44.5 | 43.5 |
| Energy Average | | 43.8 | Average: | | 49.9 | 49.5 | 48.2 | 46.7 | 40.8 | 37.2 | 35.0 | 34.7 | 34.4 |

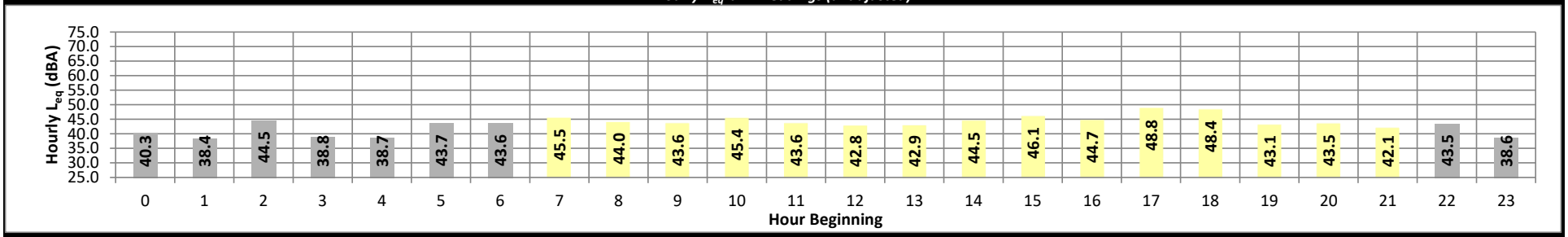
| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| 51.1 | 46.6 | 43.8 |

## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L5 - Located northeast of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 7288 Mojave Tropico Road. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 40.3 | 50.2 | 32.9 | 49.9 | 49.5 | 47.9 | 46.2 | 37.9 | 34.4 | 33.2 | 33.1 | 32.9 | 40.3 | 10.0 | 50.3 |
| | 1 | 38.4 | 47.8 | 33.3 | 47.1 | 46.3 | 44.3 | 42.6 | 37.9 | 35.6 | 33.7 | 33.6 | 33.4 | 38.4 | 10.0 | 48.4 |
| | 2 | 44.5 | 55.0 | 35.0 | 54.0 | 53.0 | 50.5 | 49.1 | 44.8 | 40.4 | 36.2 | 35.7 | 35.1 | 44.5 | 10.0 | 54.5 |
| | 3 | 38.8 | 47.7 | 32.1 | 47.5 | 47.2 | 46.1 | 45.0 | 37.8 | 33.6 | 32.4 | 32.3 | 32.2 | 38.8 | 10.0 | 48.8 |
| | 4 | 38.7 | 48.6 | 33.1 | 48.2 | 47.7 | 45.7 | 44.0 | 36.3 | 34.0 | 33.4 | 33.3 | 33.2 | 38.7 | 10.0 | 48.7 |
| | 5 | 43.7 | 53.9 | 34.7 | 53.6 | 53.3 | 51.5 | 49.3 | 41.7 | 37.6 | 35.3 | 35.1 | 34.8 | 43.7 | 10.0 | 53.7 |
| | 6 | 43.6 | 52.2 | 34.9 | 51.9 | 51.6 | 50.4 | 49.1 | 43.6 | 38.6 | 35.4 | 35.2 | 34.9 | 43.6 | 10.0 | 53.6 |
| Day | 7 | 45.5 | 54.8 | 35.7 | 54.5 | 54.1 | 52.7 | 51.2 | 44.8 | 39.3 | 36.3 | 36.1 | 35.8 | 45.5 | 0.0 | 45.5 |
| | 8 | 44.0 | 53.0 | 35.6 | 52.8 | 52.5 | 51.4 | 50.2 | 42.8 | 38.5 | 36.2 | 35.9 | 35.7 | 44.0 | 0.0 | 44.0 |
| | 9 | 43.6 | 52.5 | 35.4 | 52.2 | 51.9 | 50.5 | 48.9 | 42.8 | 39.6 | 36.5 | 36.1 | 35.6 | 43.6 | 0.0 | 43.6 |
| | 10 | 45.4 | 54.1 | 38.1 | 53.7 | 53.0 | 50.8 | 49.0 | 45.9 | 43.0 | 39.5 | 38.9 | 38.2 | 45.4 | 0.0 | 45.4 |
| | 11 | 43.6 | 52.5 | 33.5 | 52.1 | 51.8 | 50.5 | 49.1 | 43.5 | 39.5 | 34.6 | 34.1 | 33.6 | 43.6 | 0.0 | 43.6 |
| | 12 | 42.8 | 52.0 | 34.1 | 51.7 | 51.2 | 49.9 | 48.5 | 41.6 | 38.4 | 35.2 | 34.7 | 34.3 | 42.8 | 0.0 | 42.8 |
| | 13 | 42.9 | 51.7 | 33.5 | 51.4 | 51.0 | 49.5 | 48.3 | 42.8 | 38.3 | 34.4 | 34.0 | 33.6 | 42.9 | 0.0 | 42.9 |
| | 14 | 44.5 | 53.2 | 34.0 | 52.8 | 52.5 | 51.3 | 50.2 | 44.3 | 39.8 | 35.0 | 34.6 | 34.1 | 44.5 | 0.0 | 44.5 |
| | 15 | 46.1 | 63.9 | 34.3 | 63.7 | 63.4 | 61.4 | 59.1 | 47.7 | 40.8 | 35.8 | 35.0 | 34.5 | 46.1 | 0.0 | 46.1 |
| | 16 | 44.7 | 58.6 | 33.9 | 58.3 | 58.0 | 56.7 | 55.1 | 47.7 | 42.6 | 35.0 | 34.6 | 34.1 | 44.7 | 0.0 | 44.7 |
| | 17 | 48.8 | 57.6 | 37.8 | 57.2 | 56.7 | 55.4 | 54.3 | 48.9 | 44.4 | 39.4 | 38.7 | 38.0 | 48.8 | 0.0 | 48.8 |
| | 18 | 48.4 | 57.1 | 39.5 | 56.5 | 55.9 | 54.4 | 53.3 | 48.6 | 45.1 | 40.9 | 40.3 | 39.7 | 48.4 | 0.0 | 48.4 |
| | 19 | 43.1 | 52.7 | 33.5 | 52.4 | 51.9 | 50.2 | 48.6 | 42.6 | 37.3 | 34.0 | 33.8 | 33.6 | 43.1 | 5.0 | 48.1 |
| | 20 | 43.5 | 67.3 | 35.6 | 67.0 | 66.3 | 62.9 | 59.1 | 45.8 | 40.9 | 36.5 | 36.2 | 35.7 | 43.5 | 5.0 | 48.5 |
| | 21 | 42.1 | 51.8 | 33.4 | 51.5 | 51.1 | 49.6 | 47.8 | 40.9 | 36.0 | 34.0 | 33.8 | 33.5 | 42.1 | 5.0 | 47.1 |
| Night | 22 | 43.5 | 59.1 | 42.8 | 58.7 | 58.1 | 57.0 | 55.9 | 52.3 | 49.4 | 44.6 | 43.8 | 43.1 | 43.5 | 10.0 | 53.5 |
| | 23 | 38.6 | 47.9 | 32.6 | 47.5 | 46.8 | 45.5 | 44.2 | 37.7 | 34.4 | 32.9 | 32.7 | 32.6 | 38.6 | 10.0 | 48.6 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 42.1 | 51.7 | 33.4 | 51.4 | 51.0 | 49.5 | 47.8 | 40.9 | 36.0 | 34.0 | 33.8 | 33.5 |
| | Max | 48.8 | 67.3 | 39.5 | 67.0 | 66.3 | 62.9 | 59.1 | 48.9 | 45.1 | 40.9 | 40.3 | 39.7 |
| Energy Average | | 45.1 | Average: | | 55.2 | 54.8 | 53.2 | 51.5 | 44.7 | 40.2 | 36.2 | 35.8 | 35.3 |
| Night | Min | 38.4 | 47.7 | 32.1 | 47.1 | 46.3 | 44.3 | 42.6 | 36.3 | 33.6 | 32.4 | 32.3 | 32.2 |
| | Max | 44.5 | 59.1 | 42.8 | 58.7 | 58.1 | 57.0 | 55.9 | 52.3 | 49.4 | 44.6 | 43.8 | 43.1 |
| Energy Average | | 41.8 | Average: | | 50.9 | 50.4 | 48.8 | 47.3 | 41.1 | 37.6 | 35.2 | 35.0 | 34.7 |

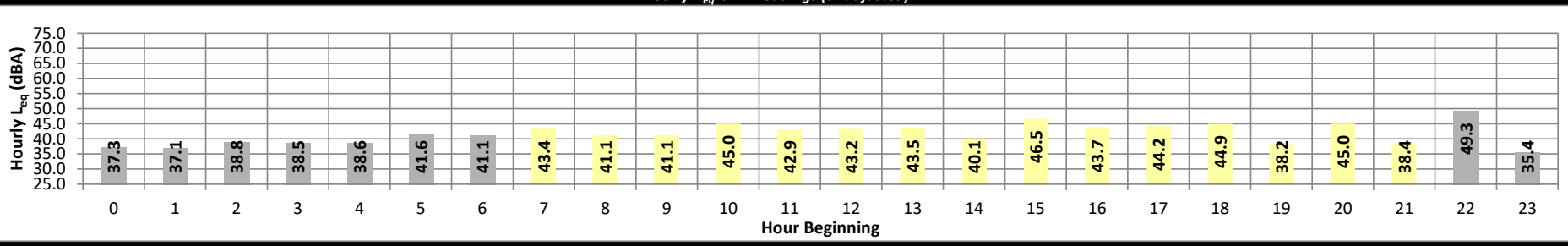
| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| **49.2** | **45.1** | **41.8** |

## 24-Hour Noise Level Measurement Summary

*Date:* Monday, December 6, 2021 *Location:* L6 - Located northeast of the Project site near single-family *Meter:* Piccolo II *JN:* 13533

*Project:* Gem Hill Quarry *Source:* residence at 7167 Mojave Tropico Road. *Analyst:* A. Khan

***Hourly $L_{eq}$ dBA Readings (unadjusted)***




| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% | $L_{eq}$ | Adj. | Adj. $L_{eq}$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Night | 0 | 37.3 | 44.8 | 32.9 | 44.4 | 44.1 | 43.2 | 42.3 | 36.9 | 34.3 | 33.3 | 33.2 | 33.0 | 37.3 | 10.0 | 47.3 |
| | 1 | 37.1 | 45.9 | 33.3 | 44.6 | 43.3 | 41.0 | 40.0 | 37.2 | 35.5 | 33.9 | 33.7 | 33.4 | 37.1 | 10.0 | 47.1 |
| | 2 | 38.8 | 47.5 | 34.3 | 46.3 | 45.1 | 43.1 | 41.9 | 39.1 | 37.1 | 35.1 | 34.7 | 34.4 | 38.8 | 10.0 | 48.8 |
| | 3 | 38.5 | 48.1 | 32.8 | 46.9 | 46.0 | 44.4 | 43.4 | 38.3 | 34.5 | 33.2 | 33.0 | 32.9 | 38.5 | 10.0 | 48.5 |
| | 4 | 38.6 | 48.8 | 33.8 | 47.4 | 46.3 | 44.4 | 43.4 | 37.2 | 35.5 | 34.2 | 34.0 | 33.8 | 38.6 | 10.0 | 48.6 |
| | 5 | 41.6 | 50.2 | 35.4 | 49.9 | 49.6 | 48.4 | 47.2 | 40.8 | 37.3 | 35.8 | 35.7 | 35.5 | 41.6 | 10.0 | 51.6 |
| | 6 | 41.1 | 48.9 | 35.0 | 48.6 | 48.2 | 47.0 | 46.1 | 41.3 | 37.4 | 35.6 | 35.3 | 35.1 | 41.1 | 10.0 | 51.1 |
| Day | 7 | 43.4 | 52.3 | 36.0 | 51.9 | 51.6 | 49.9 | 48.8 | 42.5 | 38.9 | 36.6 | 36.4 | 36.1 | 43.4 | 0.0 | 43.4 |
| | 8 | 41.1 | 49.0 | 35.2 | 48.7 | 48.4 | 47.2 | 46.4 | 40.7 | 37.7 | 35.9 | 35.6 | 35.4 | 41.1 | 0.0 | 41.1 |
| | 9 | 41.1 | 49.2 | 35.2 | 48.7 | 48.2 | 46.9 | 45.7 | 41.2 | 38.3 | 36.0 | 35.6 | 35.3 | 41.1 | 0.0 | 41.1 |
| | 10 | 45.0 | 53.1 | 36.3 | 52.7 | 52.0 | 50.9 | 49.6 | 45.2 | 43.2 | 38.0 | 37.4 | 36.5 | 45.0 | 0.0 | 45.0 |
| | 11 | 42.9 | 50.8 | 33.4 | 50.5 | 50.1 | 49.1 | 48.0 | 43.8 | 39.7 | 34.9 | 34.2 | 33.7 | 42.9 | 0.0 | 42.9 |
| | 12 | 43.2 | 51.4 | 34.0 | 51.1 | 50.7 | 49.8 | 48.6 | 43.5 | 39.0 | 35.3 | 34.8 | 34.2 | 43.2 | 0.0 | 43.2 |
| | 13 | 43.5 | 51.7 | 32.9 | 51.2 | 50.7 | 49.5 | 48.6 | 44.2 | 39.6 | 34.3 | 33.7 | 33.0 | 43.5 | 0.0 | 43.5 |
| | 14 | 40.1 | 48.5 | 32.8 | 48.0 | 47.3 | 46.1 | 45.0 | 40.4 | 36.9 | 33.6 | 33.3 | 32.9 | 40.1 | 0.0 | 40.1 |
| | 15 | 46.5 | 56.8 | 32.4 | 56.5 | 56.1 | 54.7 | 53.4 | 42.4 | 36.7 | 33.1 | 32.8 | 32.5 | 46.5 | 0.0 | 46.5 |
| | 16 | 43.7 | 51.8 | 32.8 | 51.4 | 51.0 | 49.7 | 48.8 | 45.1 | 39.1 | 33.8 | 33.3 | 32.9 | 43.7 | 0.0 | 43.7 |
| | 17 | 44.2 | 52.4 | 36.4 | 52.0 | 51.4 | 49.7 | 48.6 | 44.8 | 41.8 | 37.6 | 37.0 | 36.5 | 44.2 | 0.0 | 44.2 |
| | 18 | 44.9 | 52.6 | 38.9 | 52.1 | 51.3 | 49.7 | 48.5 | 45.4 | 43.2 | 40.1 | 39.5 | 39.1 | 44.9 | 0.0 | 44.9 |
| | 19 | 38.2 | 46.8 | 32.7 | 46.3 | 45.6 | 44.2 | 42.7 | 38.2 | 35.3 | 33.2 | 33.0 | 32.7 | 38.2 | 5.0 | 43.2 |
| | 20 | 45.0 | 55.1 | 34.7 | 54.9 | 54.8 | 53.5 | 50.9 | 42.8 | 38.7 | 35.5 | 35.2 | 34.8 | 45.0 | 5.0 | 50.0 |
| | 21 | 38.4 | 44.9 | 32.9 | 44.6 | 44.4 | 43.6 | 42.8 | 39.3 | 35.7 | 33.5 | 33.3 | 33.0 | 38.4 | 5.0 | 43.4 |
| Night | 22 | 49.3 | 55.7 | 41.5 | 55.1 | 54.3 | 53.5 | 52.8 | 50.2 | 48.1 | 44.8 | 42.8 | 41.7 | 49.3 | 10.0 | 59.3 |
| | 23 | 35.4 | 41.1 | 32.5 | 40.8 | 40.5 | 39.5 | 38.5 | 35.7 | 34.1 | 33.0 | 32.8 | 32.6 | 35.4 | 10.0 | 45.4 |

| Timeframe | Hour | $L_{eq}$ | $L_{max}$ | $L_{min}$ | L1% | L2% | L5% | L8% | L25% | L50% | L90% | L95% | L99% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day | Min | 38.2 | 44.9 | 32.4 | 44.6 | 44.4 | 43.6 | 42.7 | 38.2 | 35.3 | 33.1 | 32.8 | 32.5 |
| | Max | 46.5 | 56.8 | 38.9 | 56.5 | 56.1 | 54.7 | 53.4 | 45.4 | 43.2 | 40.1 | 39.5 | 39.1 |
| Energy Average | | 43.3 | Average: | | 50.7 | 50.2 | 49.0 | 47.8 | 42.6 | 38.9 | 35.4 | 35.0 | 34.6 |
| Night | Min | 35.4 | 41.1 | 32.5 | 40.8 | 40.5 | 39.5 | 38.5 | 35.7 | 34.1 | 33.0 | 32.8 | 32.6 |
| | Max | 49.3 | 55.7 | 41.5 | 55.1 | 54.3 | 53.5 | 52.8 | 50.2 | 48.1 | 44.8 | 42.8 | 41.7 |
| Energy Average | | 42.2 | Average: | | 47.1 | 46.4 | 44.9 | 44.0 | 39.6 | 37.1 | 35.4 | 35.0 | 34.7 |

| CNEL | Leq (dBA) Daytime (7am-10pm) | Leq (dBA) Nighttime (10pm-7am) |
|---|---|---|
| **49.0** | **43.3** | **42.2** |

# APPENDIX 6.1:

# OFF-SITE TRAFFIC VEHICLE MIX CALCULATIONS

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| Alt2 | Alt2 | | Existing No Project ADT (Trips) | | | | Autos | | | Trucks | | | | | | Project ADT Time of Day Splits from 24-Machine Counts | | | | | | | | | Existing Day + Project Trips | | | | | | | | | Total ADT (Trips) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SegmentID | Roadway | Segment | Autos | MT | HT | Total | In | Out | Trips | In | Out | Trips | MT | HT | Total | A_Day | A_Eve | A_Night | MT_Day | MT_Eve | MT_Night | HT_Day | HT_Eve | HT_Night | A_Day | A_Eve | A_Night | MT_Day | MT_Eve | MT_Night | HT_Day | HT_Eve | HT_Night | A_Daily | MT_Daily | HT_Daily | Total |
| 1 | Willow Springs Rd. | n/o Backus Rd. | 1,744 | 33 | 13 | 1,790 | 0% | 75% | 15 | 0% | 75% | 101 | 0 | 101 | 116 | 12 | 2 | 1 | 0 | 0 | 0 | 101 | 0 | 0 | 1,363 | 227 | 169 | 28 | 2 | 3 | 112 | 0 | 1 | 1,759 | 33 | 114 | 1,906 |
| 2 | Mojave Tropico Rd. | s/o Backus Rd. | 1,002 | 19 | 8 | 1,029 | 0% | 100% | 20 | 0% | 100% | 134 | 0 | 134 | 154 | 16 | 3 | 2 | 0 | 0 | 0 | 134 | 0 | 0 | 792 | 132 | 98 | 16 | 1 | 2 | 141 | 0 | 1 | 1,022 | 19 | 142 | 1,183 |
| 3 | Backus Rd. | w/o Mojave Tropico Rd. | 1,116 | 21 | 8 | 1,146 | 0% | 75% | 15 | 0% | 75% | 101 | 0 | 101 | 116 | 12 | 2 | 1 | 0 | 0 | 0 | 101 | 0 | 0 | 877 | 146 | 109 | 18 | 1 | 2 | 108 | 0 | 1 | 1,131 | 21 | 109 | 1,262 |
| 4 | Backus Rd. | e/o Mojave Tropico Rd. | 2,188 | 41 | 17 | 2,246 | 5% | 25% | 6 | 5% | 25% | 40 | 0 | 40 | 46 | 5 | 1 | 1 | 0 | 0 | 0 | 40 | 0 | 0 | 1,700 | 283 | 211 | 35 | 2 | 4 | 55 | 0 | 2 | 2,194 | 41 | 57 | 2,292 |

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# APPENDIX 7.1:

# OFF-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E
*Road Name:* Willow Springs Rd.
*Road Segment:* n/o Backus Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,790 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 179 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 97.42% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.84% |
| *Heavy Trucks:* | 86.5% | 2.7% | 10.8% | 0.74% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -10.29 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -27.53 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -31.49 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 59.6 | 57.7 | 55.9 | 49.9 | 58.5 | 59.1 |
| *Medium Trucks:* | 53.0 | 51.5 | 45.1 | 43.6 | 52.0 | 52.3 |
| *Heavy Trucks:* | 53.0 | 51.6 | 42.6 | 43.8 | 52.2 | 52.3 |
| *Vehicle Noise:* | 61.2 | 59.4 | 56.4 | 51.6 | 60.1 | 60.6 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 12 | 26 | 56 | 121 |
| *CNEL:* | 13 | 28 | 60 | 130 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E+P
*Road Name:* Willow Springs Rd.
*Road Segment:* n/o Backus Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,906 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 191 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 92.30% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.73% |
| *Heavy Trucks:* | 98.4% | 0.3% | 1.3% | 5.97% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -10.26 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -27.53 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -22.15 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 59.6 | 57.7 | 55.9 | 49.9 | 58.5 | 59.1 |
| *Medium Trucks:* | 53.0 | 51.5 | 45.1 | 43.6 | 52.0 | 52.3 |
| *Heavy Trucks:* | 62.4 | 61.5 | 42.6 | 43.8 | 59.0 | 59.0 |
| *Vehicle Noise:* | 64.5 | 63.3 | 56.5 | 51.6 | 62.2 | 62.5 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 17 | 36 | 77 | 167 |
| *CNEL:* | 17 | 38 | 81 | 174 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E
*Road Name:* Mojave Tropico Rd.
*Road Segment:* s/o Backus Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,029 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 103 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 97.42% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.84% |
| *Heavy Trucks:* | 86.5% | 2.7% | 10.8% | 0.74% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -12.70 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -29.94 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -33.89 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 57.2 | 55.3 | 53.5 | 47.5 | 56.1 | 56.7 |
| *Medium Trucks:* | 50.6 | 49.1 | 42.7 | 41.2 | 49.6 | 49.9 |
| *Heavy Trucks:* | 50.6 | 49.2 | 40.2 | 41.4 | 49.8 | 49.9 |
| *Vehicle Noise:* | 58.8 | 57.0 | 54.0 | 49.2 | 57.7 | 58.2 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 8 | 18 | 39 | 83 |
| *CNEL:* | 9 | 19 | 42 | 90 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E+P
*Road Name:* Mojave Tropico Rd.
*Road Segment:* s/o Backus Rd.
*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,183 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 118 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 86.43% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.60% |
| *Heavy Trucks:* | 99.3% | 0.1% | 0.6% | 11.97% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -12.61 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -29.94 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -21.20 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 57.3 | 55.4 | 53.6 | 47.5 | 56.2 | 56.8 |
| *Medium Trucks:* | 50.6 | 49.1 | 42.7 | 41.2 | 49.6 | 49.9 |
| *Heavy Trucks:* | 63.3 | 62.5 | 40.2 | 41.4 | 59.7 | 59.7 |
| *Vehicle Noise:* | 64.4 | 63.4 | 54.1 | 49.2 | 61.6 | 61.8 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 15 | 33 | 70 | 151 |
| *CNEL:* | 16 | 34 | 72 | 156 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E
*Road Name:* Backus Rd.
*Road Segment:* w/o Mojave Tropico Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,146 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 115 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 97.42% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.84% |
| *Heavy Trucks:* | 86.5% | 2.7% | 10.8% | 0.74% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -12.23 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -29.47 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -33.42 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 57.6 | 55.7 | 54.0 | 47.9 | 56.5 | 57.1 |
| *Medium Trucks:* | 51.0 | 49.5 | 43.2 | 41.6 | 50.1 | 50.3 |
| *Heavy Trucks:* | 51.1 | 49.7 | 40.6 | 41.9 | 50.2 | 50.4 |
| *Vehicle Noise:* | 59.2 | 57.5 | 54.5 | 49.6 | 58.2 | 58.7 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 9 | 19 | 42 | 90 |
| *CNEL:* | 10 | 21 | 45 | 96 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E+P
*Road Name:* Backus Rd.
*Road Segment:* w/o Mojave Tropico Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 1,262 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 126 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 89.69% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.67% |
| *Heavy Trucks:* | 98.9% | 0.2% | 0.8% | 8.64% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -12.17 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -29.47 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -22.34 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 57.7 | 55.8 | 54.0 | 48.0 | 56.6 | 57.2 |
| *Medium Trucks:* | 51.0 | 49.5 | 43.2 | 41.6 | 50.1 | 50.3 |
| *Heavy Trucks:* | 62.2 | 61.3 | 40.6 | 41.9 | 58.7 | 58.7 |
| *Vehicle Noise:* | 63.7 | 62.6 | 54.6 | 49.7 | 61.1 | 61.4 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 14 | 30 | 65 | 141 |
| *CNEL:* | 15 | 32 | 68 | 146 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E
*Road Name:* Backus Rd.
*Road Segment:* e/o Mojave Tropico Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 2,246 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 225 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 97.42% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.84% |
| *Heavy Trucks:* | 86.5% | 2.7% | 10.8% | 0.74% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -9.31 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -26.55 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -30.50 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 60.6 | 58.7 | 56.9 | 50.8 | 59.5 | 60.1 |
| *Medium Trucks:* | 54.0 | 52.5 | 46.1 | 44.5 | 53.0 | 53.2 |
| *Heavy Trucks:* | 54.0 | 52.6 | 43.5 | 44.8 | 53.1 | 53.3 |
| *Vehicle Noise:* | 62.1 | 60.4 | 57.4 | 52.6 | 61.1 | 61.6 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 14 | 30 | 65 | 140 |
| *CNEL:* | 15 | 33 | 70 | 151 |

## FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

*Scenario:* E+P
*Road Name:* Backus Rd.
*Road Segment:* e/o Mojave Tropico Rd.

*Project Name:* Gem Hill Quarry
*Job Number:* 13533

### SITE SPECIFIC INPUT DATA

***Highway Data***

| | |
|---|---|
| *Average Daily Traffic (Adt):* | 2,292 vehicles |
| *Peak Hour Percentage:* | 10.00% |
| *Peak Hour Volume:* | 229 vehicles |
| *Vehicle Speed:* | 55 mph |
| *Near/Far Lane Distance:* | 12 feet |

***Site Data***

| | |
|---|---|
| ***Barrier Height:*** | **0.0 feet** |
| *Barrier Type (0-Wall, 1-Berm):* | 0.0 |
| *Centerline Dist. to Barrier:* | 55.0 feet |
| *Centerline Dist. to Observer:* | 55.0 feet |
| *Barrier Distance to Observer:* | 0.0 feet |
| *Observer Height (Above Pad):* | 5.0 feet |
| *Pad Elevation:* | 0.0 feet |
| *Road Elevation:* | 0.0 feet |
| *Road Grade:* | 0.0% |
| *Left View:* | -90.0 degrees |
| *Right View:* | 90.0 degrees |

### NOISE MODEL INPUTS

***Site Conditions (Hard = 10, Soft = 15)***

| | |
|---|---|
| *Autos:* | 15 |
| *Medium Trucks (2 Axles):* | 15 |
| *Heavy Trucks (3+ Axles):* | 15 |

***Vehicle Mix***

| *VehicleType* | *Day* | *Evening* | *Night* | *Daily* |
|---|---|---|---|---|
| *Autos:* | 77.5% | 12.9% | 9.6% | 95.72% |
| *Medium Trucks:* | 84.8% | 4.9% | 10.3% | 1.80% |
| *Heavy Trucks:* | 96.1% | 0.8% | 3.2% | 2.48% |

***Noise Source Elevations (in feet)***

| | | | |
|---|---|---|---|
| *Autos:* | 0.000 | | |
| *Medium Trucks:* | 2.297 | | |
| *Heavy Trucks:* | 8.004 | *Grade Adjustment:* | 0.0 |

***Lane Equivalent Distance (in feet)***

| | |
|---|---|
| *Autos:* | 54.900 |
| *Medium Trucks:* | 54.739 |
| *Heavy Trucks:* | 54.754 |

***FHWA Noise Model Calculations***

| *VehicleType* | *REMEL* | *Traffic Flow* | *Distance* | *Finite Road* | *Fresnel* | *Barrier Atten* | *Berm Atten* |
|---|---|---|---|---|---|---|---|
| *Autos:* | 71.78 | -9.30 | -0.71 | -1.20 | *-4.67* | 0.000 | 0.000 |
| *Medium Trucks:* | 82.40 | -26.55 | -0.69 | -1.20 | *-4.87* | 0.000 | 0.000 |
| *Heavy Trucks:* | 86.40 | -25.16 | -0.70 | -1.20 | *-5.38* | 0.000 | 0.000 |

***Unmitigated Noise Levels (without Topo and barrier attenuation)***

| *VehicleType* | *Leq Peak Hour* | *Leq Day* | *Leq Evening* | *Leq Night* | *Ldn* | *CNEL* |
|---|---|---|---|---|---|---|
| *Autos:* | 60.6 | 58.7 | 56.9 | 50.9 | 59.5 | 60.1 |
| *Medium Trucks:* | 54.0 | 52.5 | 46.1 | 44.5 | 53.0 | 53.2 |
| *Heavy Trucks:* | 59.3 | 58.4 | 43.5 | 44.8 | 56.6 | 56.7 |
| *Vehicle Noise:* | 63.5 | 62.0 | 57.4 | 52.6 | 61.9 | 62.3 |

***Centerline Distance to Noise Contour (in feet)***

| | *70 dBA* | *65 dBA* | *60 dBA* | *55 dBA* |
|---|---|---|---|---|
| *Ldn:* | 16 | 34 | 74 | 158 |
| *CNEL:* | 17 | 36 | 78 | 168 |

# APPENDIX 9.1:

# CADNAA OPERATIONAL NOISE MODEL

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# 13533 - Gem Hill Quarry

**CadnaA Noise Prediction Model:** 13533-02.cna
**Date:** 12.01.22
**Analyst:** B. Lawson

## Calculation Configuration

| Configuration | |
|---|---|
| **Parameter** | **Value** |
| **General** | |
| **Country** | **(user defined)** |
| **Max. Error (dB)** | **0.00** |
| **Max. Search Radius (#(Unit,LEN))** | **2000.01** |
| **Min. Dist Src to Rcvr** | **0.00** |
| **Partition** | |
| **Raster Factor** | **0.50** |
| **Max. Length of Section (#(Unit,LEN))** | **999.99** |
| **Min. Length of Section (#(Unit,LEN))** | **1.01** |
| **Min. Length of Section (%)** | **0.00** |
| **Proj. Line Sources** | **On** |
| **Proj. Area Sources** | **On** |
| **Ref. Time** | |
| **Reference Time Day (min)** | **960.00** |
| **Reference Time Night (min)** | **480.00** |
| **Daytime Penalty (dB)** | **0.00** |
| **Recr. Time Penalty (dB)** | **5.00** |
| **Night-time Penalty (dB)** | **10.00** |
| **DTM** | |
| **Standard Height (m)** | **0.00** |
| **Model of Terrain** | **Triangulation** |
| **Reflection** | |
| **max. Order of Reflection** | **2** |
| **Search Radius Src** | **100.00** |
| **Search Radius Rcvr** | **100.00** |
| **Max. Distance Source - Rcvr** | **1000.00 1000.00** |
| **Min. Distance Rvcr - Reflector** | **1.00 1.00** |
| **Min. Distance Source - Reflector** | **0.10** |
| **Industrial (ISO 9613)** | |
| **Lateral Diffraction** | **some Obj** |
| **Obst. within Area Src do not shield** | **On** |
| **Screening** | **Incl. Ground Att. over Barrier** |
| | **Dz with limit (20/25)** |
| **Barrier Coefficients C1,2,3** | **3.0 20.0 0.0** |
| **Temperature (#(Unit,TEMP))** | **10** |
| **rel. Humidity (%)** | **70** |
| **Ground Absorption G** | **0.50** |
| **Wind Speed for Dir. (#(Unit,SPEED))** | **3.0** |
| **Roads (RLS-90)** | |
| **Strictly acc. to RLS-90** | |
| **Railways (FTA/FRA)** | |
| **Aircraft (???)** | |
| **Strictly acc. to AzB** | |

## Receiver Noise Levels

| Name | M. | ID | Level Lr | | | Limit. Value | | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | CNEL | Day | Night | CNEL | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | | (ft) | | (ft) | (ft) | (ft) |
| RECEIVERS | | R1 | 25.0 | 25.0 | 31.7 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5969942.26 | 2653752.61 | 2765.69 |
| RECEIVERS | | R2 | 28.2 | 28.2 | 34.8 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5971403.98 | 2653279.56 | 2752.40 |
| RECEIVERS | | R3 | 28.4 | 28.4 | 35.0 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5973447.35 | 2652643.24 | 2732.11 |
| RECEIVERS | | R4 | 33.3 | 33.3 | 40.0 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5973544.57 | 2650936.20 | 2725.00 |
| RECEIVERS | | R5 | 35.3 | 35.3 | 42.0 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5973841.62 | 2650071.86 | 2760.18 |
| RECEIVERS | | R6 | 35.0 | 35.0 | 41.7 | 0.0 | 0.0 | 65.0 | | | | 5.00 | r | 5972825.38 | 2649511.38 | 2771.33 |

## Line Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL' | | | Lw / Li | | | Operating Time | | | Moving Pt. Src | | | | Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | Number | | | Speed | | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | Day | Evening | Night | (mph) | (ft) | |
| LINESOURCE | | HAUL01 | 94.1 | 94.1 | 94.1 | 62.7 | 62.7 | 62.7 | Lw | OS1 | | | | | | | | | 8 | r |
| LINESOURCE | | HAUL02 | 94.1 | 94.1 | 94.1 | 65.5 | 65.5 | 65.5 | Lw | OS1 | | | | | | | | | 8 | r |
| LINESOURCE | | HAUL03 | 94.1 | 94.1 | 94.1 | 69.3 | 69.3 | 69.3 | Lw | OS1 | | | | | | | | | 8 | r |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| LINESOURCE | 8.00 | r | | | 5972564.39 | 2647037.08 | 2648.00 | 2640.00 |
| | | | | | 5972553.23 | 2647037.00 | 2648.00 | 2640.00 |
| | | | | | 5972542.21 | 2647038.74 | 2648.00 | 2640.00 |

| Name | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|
| | Begin | End | x | y | z | Ground |
| | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |
| | | | 5972531.62 | 2647042.28 | 2648.00 | 2640.00 |
| | | | 5972521.75 | 2647047.50 | 2648.00 | 2640.00 |
| | | | 5972512.88 | 2647054.27 | 2648.00 | 2640.00 |
| | | | 5972505.23 | 2647062.40 | 2648.00 | 2640.00 |
| | | | 5972499.02 | 2647071.67 | 2648.00 | 2640.00 |
| | | | 5972494.41 | 2647081.84 | 2648.41 | 2640.41 |
| | | | 5972491.54 | 2647092.63 | 2648.86 | 2640.86 |
| | | | 5972464.75 | 2647188.25 | 2653.34 | 2645.34 |
| | | | 5972459.25 | 2647203.61 | 2654.18 | 2646.18 |
| | | | 5972451.82 | 2647218.14 | 2654.99 | 2646.99 |
| | | | 5972442.58 | 2647231.59 | 2655.86 | 2647.86 |
| | | | 5972431.68 | 2647243.74 | 2656.79 | 2648.79 |
| | | | 5972419.31 | 2647254.38 | 2657.76 | 2649.76 |
| | | | 5972405.67 | 2647263.34 | 2658.76 | 2650.76 |
| | | | 5972390.99 | 2647270.46 | 2659.77 | 2651.77 |
| | | | 5972367.79 | 2647277.78 | 2661.25 | 2653.25 |
| | | | 5972345.08 | 2647286.52 | 2662.74 | 2654.74 |
| | | | 5972322.97 | 2647296.65 | 2664.24 | 2656.24 |
| | | | 5972308.25 | 2647307.66 | 2665.35 | 2657.35 |
| | | | 5972295.05 | 2647320.45 | 2666.43 | 2658.43 |
| | | | 5972283.56 | 2647334.79 | 2667.45 | 2659.45 |
| | | | 5972273.97 | 2647350.47 | 2668.56 | 2660.56 |
| | | | 5972266.43 | 2647367.23 | 2669.77 | 2661.77 |
| | | | 5972261.06 | 2647384.81 | 2670.84 | 2662.84 |
| | | | 5972257.95 | 2647402.92 | 2671.76 | 2663.76 |
| | | | 5972255.16 | 2647419.75 | 2672.60 | 2664.60 |
| | | | 5972250.17 | 2647436.05 | 2673.59 | 2665.59 |
| | | | 5972243.06 | 2647451.56 | 2674.72 | 2666.72 |
| | | | 5972233.97 | 2647465.98 | 2675.96 | 2667.96 |
| | | | 5972223.05 | 2647479.08 | 2677.28 | 2669.28 |
| | | | 5972210.49 | 2647490.62 | 2678.68 | 2670.68 |
| | | | 5972196.51 | 2647500.39 | 2680.12 | 2672.12 |
| | | | 5972181.36 | 2647508.23 | 2681.22 | 2673.22 |
| | | | 5972165.31 | 2647513.99 | 2682.14 | 2674.14 |
| | | | 5972148.64 | 2647517.58 | 2682.96 | 2674.96 |
| | | | 5972131.64 | 2647518.93 | 2683.67 | 2675.67 |
| | | | 5972114.61 | 2647518.02 | 2684.26 | 2676.26 |
| | | | 5971984.99 | 2647505.16 | 2685.23 | 2677.23 |
| | | | 5971933.47 | 2647507.05 | 2685.57 | 2677.57 |
| | | | 5971882.06 | 2647510.84 | 2685.28 | 2677.28 |
| | | | 5971830.83 | 2647516.55 | 2685.10 | 2677.10 |
| | | | 5971779.84 | 2647524.15 | 2685.06 | 2677.06 |
| | | | 5971729.17 | 2647533.65 | 2686.05 | 2678.05 |
| | | | 5971629.34 | 2647541.09 | 2688.00 | 2680.00 |
| | | | 5971529.36 | 2647546.05 | 2688.00 | 2680.00 |
| | | | 5971429.29 | 2647548.51 | 2689.83 | 2681.83 |
| | | | 5971267.67 | 2647557.20 | 2704.10 | 2696.10 |
| | | | 5971106.08 | 2647566.60 | 2716.29 | 2708.28 |
| | | | 5970995.25 | 2647587.70 | 2724.78 | 2716.78 |
| | | | 5970884.74 | 2647610.37 | 2736.12 | 2728.12 |
| | | | 5970870.76 | 2647623.78 | 2737.65 | 2729.65 |
| | | | 5970855.64 | 2647635.89 | 2738.90 | 2730.90 |
| | | | 5970839.49 | 2647646.60 | 2740.28 | 2732.28 |
| | | | 5970822.44 | 2647655.82 | 2741.88 | 2733.88 |
| | | | 5970804.65 | 2647663.47 | 2743.62 | 2735.62 |
| | | | 5970742.56 | 2647680.16 | 2747.93 | 2739.93 |
| | | | 5970680.83 | 2647698.10 | 2752.27 | 2744.27 |
| | | | 5970658.06 | 2647709.58 | 2753.88 | 2745.88 |
| | | | 5970636.21 | 2647722.74 | 2756.26 | 2748.26 |
| | | | 5970615.41 | 2647737.50 | 2758.58 | 2750.58 |
| | | | 5970595.77 | 2647753.78 | 2760.66 | 2752.66 |
| | | | 5970581.20 | 2647774.62 | 2761.82 | 2753.82 |
| | | | 5970567.91 | 2647796.30 | 2762.73 | 2754.73 |
| | | | 5970555.95 | 2647818.73 | 2763.41 | 2755.41 |
| | | | 5970518.76 | 2647857.01 | 2766.58 | 2758.58 |
| | | | 5970482.95 | 2647896.59 | 2770.13 | 2762.13 |
| | | | 5970448.56 | 2647937.41 | 2773.72 | 2765.72 |
| | | | 5970440.67 | 2647951.46 | 2774.59 | 2766.59 |
| | | | 5970434.89 | 2647966.51 | 2775.02 | 2767.02 |
| | | | 5970431.36 | 2647982.24 | 2775.09 | 2767.09 |
| | | | 5970430.13 | 2647998.32 | 2775.31 | 2767.31 |
| | | | 5970431.25 | 2648014.40 | 2775.16 | 2767.16 |
| | | | 5970434.68 | 2648030.15 | 2774.65 | 2766.65 |
| | | | 5970440.35 | 2648045.24 | 2773.80 | 2765.80 |
| | | | 5970455.90 | 2648091.14 | 2771.45 | 2763.45 |
| | | | 5970473.64 | 2648136.24 | 2769.14 | 2761.14 |
| | | | 5970493.53 | 2648180.43 | 2767.64 | 2759.64 |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | 5970531.74 | 2648252.51 | 2765.54 | 2757.54 |
| | | | | | 5970568.58 | 2648325.28 | 2762.97 | 2754.97 |
| | | | | | 5970578.58 | 2648355.30 | 2762.37 | 2754.37 |
| | | | | | 5970586.59 | 2648385.91 | 2761.93 | 2753.93 |
| | | | | | 5970592.58 | 2648416.98 | 2762.84 | 2754.84 |
| | | | | | 5970596.52 | 2648448.37 | 2765.55 | 2757.55 |
| | | | | | 5970597.56 | 2648488.81 | 2769.64 | 2761.64 |
| | | | | | 5970600.44 | 2648529.16 | 2774.55 | 2766.55 |
| | | | | | 5970605.17 | 2648569.33 | 2779.02 | 2771.02 |
| | | | | | 5970611.73 | 2648609.25 | 2783.31 | 2775.31 |
| | | | | | 5970621.49 | 2648642.36 | 2786.04 | 2778.04 |
| | | | | | 5970629.57 | 2648675.93 | 2788.98 | 2780.98 |
| | | | | | 5970635.95 | 2648709.86 | 2793.56 | 2785.56 |
| | | | | | 5970642.97 | 2648735.70 | 2797.39 | 2789.39 |
| | | | | | 5970651.20 | 2648761.18 | 2800.86 | 2792.86 |
| | | | | | 5970660.61 | 2648786.25 | 2805.24 | 2797.24 |
| | | | | | 5970673.20 | 2648796.59 | 2807.28 | 2799.28 |
| | | | | | 5970687.16 | 2648805.00 | 2809.35 | 2801.35 |
| | | | | | 5970702.18 | 2648811.30 | 2811.16 | 2803.16 |
| | | | | | 5970717.96 | 2648815.36 | 2812.41 | 2804.41 |
| | | | | | 5970734.16 | 2648817.10 | 2813.07 | 2805.07 |
| | | | | | 5970750.44 | 2648816.48 | 2813.13 | 2805.13 |
| | | | | | 5970783.42 | 2648815.21 | 2811.14 | 2803.14 |
| | | | | | 5970816.34 | 2648812.87 | 2807.06 | 2799.06 |
| | | | | | 5970839.25 | 2648815.11 | 2804.14 | 2796.14 |
| | | | | | 5970861.91 | 2648819.19 | 2800.77 | 2792.77 |
| | | | | | 5970884.16 | 2648825.10 | 2796.18 | 2788.18 |
| | | | | | 5970915.56 | 2648828.14 | 2788.73 | 2780.73 |
| | | | | | 5970947.10 | 2648829.02 | 2782.31 | 2774.31 |
| | | | | | 5970978.62 | 2648827.76 | 2775.73 | 2767.73 |
| | | | | | 5971009.99 | 2648824.35 | 2770.70 | 2762.70 |
| | | | | | 5971041.05 | 2648818.80 | 2766.79 | 2758.79 |
| | | | | | 5971071.65 | 2648811.15 | 2764.28 | 2756.28 |
| | | | | | 5971101.67 | 2648801.43 | 2761.58 | 2753.58 |
| | | | | | 5971112.72 | 2648785.90 | 2759.29 | 2751.29 |
| | | | | | 5971122.27 | 2648769.41 | 2756.99 | 2748.99 |
| | | | | | 5971130.24 | 2648752.09 | 2754.68 | 2746.68 |
| | | | | | 5971136.55 | 2648734.11 | 2752.34 | 2744.34 |
| | | | | | 5971141.14 | 2648715.61 | 2750.03 | 2742.03 |
| | | | | | 5971148.10 | 2648690.91 | 2746.88 | 2738.88 |
| | | | | | 5971153.20 | 2648665.75 | 2743.74 | 2735.74 |
| | | | | | 5971156.39 | 2648640.28 | 2741.29 | 2733.29 |
| | | | | | 5971157.67 | 2648614.64 | 2739.25 | 2731.25 |
| | | | | | 5971157.02 | 2648588.98 | 2737.33 | 2729.33 |
| | | | | | 5971154.46 | 2648563.44 | 2735.55 | 2727.55 |
| | | | | | 5971145.53 | 2648517.98 | 2732.64 | 2724.64 |
| | | | | | 5971135.41 | 2648472.76 | 2729.82 | 2721.82 |
| | | | | | 5971131.37 | 2648447.11 | 2728.12 | 2720.12 |
| | | | | | 5971128.90 | 2648421.26 | 2726.79 | 2718.79 |
| | | | | | 5971128.00 | 2648395.31 | 2725.72 | 2717.72 |
| | | | | | 5971128.68 | 2648369.35 | 2724.57 | 2716.57 |
| | | | | | 5971136.55 | 2648315.76 | 2722.02 | 2714.02 |
| | | | | | 5971146.52 | 2648262.51 | 2719.50 | 2711.50 |
| | | | | | 5971158.59 | 2648209.70 | 2717.58 | 2709.58 |
| | | | | | 5971172.72 | 2648157.40 | 2716.52 | 2708.52 |
| LINESOURCE | 8.00 | r | | | 5971629.34 | 2647541.09 | 2688.00 | 2680.00 |
| | | | | | 5971118.07 | 2647047.68 | 2695.08 | 2687.08 |
| | | | | | 5971098.90 | 2647033.95 | 2697.41 | 2689.41 |
| | | | | | 5971078.57 | 2647022.01 | 2699.68 | 2691.68 |
| | | | | | 5971057.24 | 2647011.96 | 2701.88 | 2693.88 |
| | | | | | 5971035.08 | 2647003.88 | 2703.99 | 2695.99 |
| | | | | | 5971012.29 | 2646997.85 | 2705.98 | 2697.98 |
| | | | | | 5970989.04 | 2646993.90 | 2707.85 | 2699.85 |
| | | | | | 5970965.53 | 2646992.08 | 2708.00 | 2700.00 |
| | | | | | 5970693.54 | 2646996.62 | 2708.00 | 2700.00 |
| | | | | | 5970670.55 | 2646993.99 | 2708.00 | 2700.00 |
| | | | | | 5970647.91 | 2646989.17 | 2708.00 | 2700.00 |
| | | | | | 5970625.84 | 2646982.21 | 2708.00 | 2700.00 |
| | | | | | 5970604.53 | 2646973.17 | 2708.00 | 2700.00 |
| | | | | | 5970584.18 | 2646962.13 | 2708.00 | 2700.00 |
| | | | | | 5970564.98 | 2646949.21 | 2708.00 | 2700.00 |
| | | | | | 5970547.11 | 2646934.50 | 2708.84 | 2700.84 |
| | | | | | 5970530.72 | 2646918.16 | 2710.55 | 2702.55 |
| | | | | | 5970515.97 | 2646900.32 | 2712.58 | 2704.58 |
| | | | | | 5970502.99 | 2646881.16 | 2714.45 | 2706.45 |
| | | | | | 5970491.90 | 2646860.85 | 2716.12 | 2708.12 |
| | | | | | 5970309.07 | 2646483.84 | 2718.90 | 2710.90 |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | 5970287.80 | 2646471.37 | 2718.29 | 2710.29 |
| | | | | | 5970265.49 | 2646460.89 | 2718.61 | 2710.60 |
| | | | | | 5970242.31 | 2646452.48 | 2719.60 | 2711.60 |
| | | | | | 5970218.46 | 2646446.22 | 2720.78 | 2712.78 |
| | | | | | 5970194.15 | 2646442.15 | 2722.15 | 2714.15 |
| | | | | | 5970172.77 | 2646444.74 | 2723.79 | 2715.79 |
| | | | | | 5970151.24 | 2646445.10 | 2725.28 | 2717.28 |
| | | | | | 5970129.78 | 2646443.22 | 2726.61 | 2718.61 |
| | | | | | 5970111.32 | 2646434.02 | 2727.22 | 2719.22 |
| | | | | | 5970094.10 | 2646422.67 | 2727.60 | 2719.60 |
| | | | | | 5970090.94 | 2646421.06 | 2727.71 | 2719.71 |
| | | | | | 5970088.09 | 2646418.94 | 2727.75 | 2719.75 |
| | | | | | 5970085.64 | 2646416.39 | 2727.74 | 2719.74 |
| | | | | | 5970083.64 | 2646413.46 | 2727.67 | 2719.67 |
| | | | | | 5970082.15 | 2646410.24 | 2727.55 | 2719.55 |
| | | | | | 5970081.22 | 2646406.82 | 2727.38 | 2719.38 |
| | | | | | 5970080.86 | 2646403.29 | 2727.15 | 2719.15 |
| | | | | | 5970081.10 | 2646399.76 | 2726.89 | 2718.89 |
| | | | | | 5970081.92 | 2646396.31 | 2726.59 | 2718.59 |
| | | | | | 5970083.30 | 2646393.04 | 2726.27 | 2718.27 |
| | | | | | 5970085.20 | 2646390.05 | 2725.93 | 2717.93 |
| | | | | | 5970087.57 | 2646387.42 | 2725.59 | 2717.59 |
| | | | | | 5970090.34 | 2646385.21 | 2725.25 | 2717.25 |
| | | | | | 5970280.26 | 2646242.90 | 2711.47 | 2703.47 |
| | | | | | 5970285.77 | 2646234.72 | 2711.15 | 2703.15 |
| | | | | | 5970290.03 | 2646225.82 | 2710.94 | 2702.94 |
| | | | | | 5970292.96 | 2646216.40 | 2710.86 | 2702.86 |
| | | | | | 5970294.49 | 2646206.66 | 2710.66 | 2702.66 |
| | | | | | 5970294.60 | 2646196.80 | 2709.97 | 2701.97 |
| LINESOURCE | 8.00 | r | | | 5970464.92 | 2646805.22 | 2720.06 | 2712.06 |
| | | | | | 5970406.42 | 2646838.51 | 2725.72 | 2717.72 |
| | | | | | 5970388.58 | 2646857.33 | 2727.08 | 2719.08 |
| | | | | | 5970372.20 | 2646877.45 | 2728.26 | 2720.26 |
| | | | | | 5970357.40 | 2646898.74 | 2729.25 | 2721.25 |
| | | | | | 5970284.31 | 2646984.38 | 2734.48 | 2726.48 |
| | | | | | 5970277.95 | 2646990.80 | 2734.86 | 2726.86 |
| | | | | | 5970270.64 | 2646996.13 | 2735.38 | 2727.38 |
| | | | | | 5970262.58 | 2647000.22 | 2736.03 | 2728.03 |
| | | | | | 5970253.97 | 2647002.97 | 2736.79 | 2728.79 |
| | | | | | 5970245.04 | 2647004.32 | 2737.64 | 2729.64 |
| | | | | | 5970209.50 | 2647007.86 | 2741.03 | 2733.03 |
| | | | | | 5970174.13 | 2647012.80 | 2744.04 | 2736.04 |
| | | | | | 5970138.98 | 2647019.12 | 2746.97 | 2738.97 |
| | | | | | 5970101.96 | 2647030.56 | 2749.93 | 2741.93 |
| | | | | | 5970065.80 | 2647044.46 | 2752.76 | 2744.76 |
| | | | | | 5970030.64 | 2647060.74 | 2756.71 | 2748.71 |
| | | | | | 5969996.65 | 2647079.34 | 2761.03 | 2753.03 |
| | | | | | 5969963.99 | 2647100.17 | 2764.91 | 2756.91 |
| | | | | | 5969932.79 | 2647123.14 | 2768.77 | 2760.77 |
| | | | | | 5969857.27 | 2647188.50 | 2779.18 | 2771.18 |
| | | | | | 5969838.63 | 2647214.81 | 2781.59 | 2773.59 |
| | | | | | 5969821.69 | 2647242.25 | 2783.72 | 2775.72 |
| | | | | | 5969805.91 | 2647267.28 | 2786.73 | 2778.73 |
| | | | | | 5969791.80 | 2647293.30 | 2789.66 | 2781.66 |
| | | | | | 5969785.91 | 2647300.14 | 2790.71 | 2782.71 |
| | | | | | 5969779.11 | 2647306.08 | 2791.92 | 2783.92 |
| | | | | | 5969771.53 | 2647310.99 | 2793.13 | 2785.13 |
| | | | | | 5969763.33 | 2647314.78 | 2794.32 | 2786.32 |
| | | | | | 5969754.68 | 2647317.37 | 2795.46 | 2787.46 |
| | | | | | 5969689.77 | 2647330.96 | 2803.78 | 2795.78 |

## Area Source(s)

| Name | M. | ID | Result. PWL | | | Result. PWL'' | | | Lw / Li | | | Operating Time | | | Height | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Evening | Night | Day | Evening | Night | Type | Value | norm. | Day | Special | Night | (ft) | |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | (dBA) | | | dB(A) | (min) | (min) | (min) | | |
| AREASOURCE | | LOADING01 | 101.0 | 101.0 | 101.0 | 49.3 | 49.3 | 49.3 | Lw | OS2 | | | | | 8 | r |
| AREASOURCE | | STOCK01 | 111.2 | 111.2 | 111.2 | 75.0 | 75.0 | 75.0 | Lw | OS3 | | | | | 8 | r |
| AREASOURCE | | STOCK02 | 111.2 | 111.2 | 111.2 | 66.0 | 66.0 | 66.0 | Lw | OS3 | | | | | 8 | r |
| AREASOURCE | | STOCK03 | 111.2 | 111.2 | 111.2 | 70.7 | 70.7 | 70.7 | Lw | OS3 | | | | | 8 | r |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| AREASOURCE | 8.00 | r | | | 5970468.04 | 2649033.60 | 2856.08 | 2848.08 |
| | | | | | 5970482.43 | 2649052.03 | 2859.05 | 2851.05 |
| | | | | | 5970498.70 | 2649068.84 | 2862.48 | 2854.48 |

| Name | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|
| | Begin | End | x | y | z | Ground |
| | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |
| | | | 5970516.65 | 2649083.83 | 2866.45 | 2858.45 |
| | | | 5970536.08 | 2649096.84 | 2871.10 | 2863.10 |
| | | | 5970556.78 | 2649107.72 | 2875.86 | 2867.86 |
| | | | 5970578.52 | 2649116.35 | 2880.06 | 2872.06 |
| | | | 5970601.05 | 2649122.63 | 2883.69 | 2875.69 |
| | | | 5970624.12 | 2649126.48 | 2886.69 | 2878.69 |
| | | | 5970647.46 | 2649127.88 | 2886.27 | 2878.27 |
| | | | 5970714.80 | 2649130.21 | 2878.09 | 2870.09 |
| | | | 5970782.16 | 2649131.58 | 2860.64 | 2852.64 |
| | | | 5970834.53 | 2649129.47 | 2845.32 | 2837.32 |
| | | | 5970886.73 | 2649124.76 | 2830.82 | 2822.82 |
| | | | 5970938.63 | 2649117.46 | 2819.84 | 2811.84 |
| | | | 5970990.10 | 2649107.59 | 2809.52 | 2801.52 |
| | | | 5971041.02 | 2649095.17 | 2801.53 | 2793.53 |
| | | | 5971070.83 | 2649090.71 | 2797.34 | 2789.34 |
| | | | 5971100.19 | 2649083.89 | 2793.01 | 2785.01 |
| | | | 5971128.91 | 2649074.75 | 2788.54 | 2780.54 |
| | | | 5971156.81 | 2649063.35 | 2784.20 | 2776.20 |
| | | | 5971183.71 | 2649049.76 | 2779.83 | 2771.83 |
| | | | 5971209.44 | 2649034.07 | 2775.45 | 2767.45 |
| | | | 5971233.84 | 2649016.37 | 2771.09 | 2763.09 |
| | | | 5971256.75 | 2648996.79 | 2766.89 | 2758.89 |
| | | | 5971278.03 | 2648975.44 | 2763.06 | 2755.06 |
| | | | 5971297.53 | 2648952.47 | 2759.32 | 2751.32 |
| | | | 5971315.14 | 2648928.01 | 2755.69 | 2747.69 |
| | | | 5971330.75 | 2648902.22 | 2751.66 | 2743.66 |
| | | | 5971344.25 | 2648875.28 | 2748.00 | 2740.00 |
| | | | 5971356.00 | 2648830.36 | 2745.84 | 2737.84 |
| | | | 5971365.28 | 2648784.87 | 2741.83 | 2733.83 |
| | | | 5971372.07 | 2648738.95 | 2737.77 | 2729.77 |
| | | | 5971376.34 | 2648692.72 | 2733.68 | 2725.68 |
| | | | 5971378.09 | 2648646.33 | 2729.71 | 2721.71 |
| | | | 5971377.31 | 2648599.91 | 2728.00 | 2720.00 |
| | | | 5971371.51 | 2648552.74 | 2728.00 | 2720.00 |
| | | | 5971367.88 | 2648505.37 | 2728.00 | 2720.00 |
| | | | 5971366.44 | 2648457.87 | 2728.00 | 2720.00 |
| | | | 5971367.17 | 2648410.36 | 2728.00 | 2720.00 |
| | | | 5971368.18 | 2648382.10 | 2726.25 | 2718.25 |
| | | | 5971371.64 | 2648354.04 | 2722.88 | 2714.88 |
| | | | 5971377.51 | 2648326.38 | 2719.61 | 2711.61 |
| | | | 5971385.76 | 2648299.33 | 2719.21 | 2711.21 |
| | | | 5971396.32 | 2648273.10 | 2717.62 | 2709.62 |
| | | | 5971409.11 | 2648247.89 | 2716.97 | 2708.97 |
| | | | 5971424.04 | 2648223.87 | 2715.88 | 2707.88 |
| | | | 5971439.38 | 2648186.75 | 2713.29 | 2705.29 |
| | | | 5971452.76 | 2648148.88 | 2711.04 | 2703.04 |
| | | | 5971464.15 | 2648110.36 | 2708.76 | 2700.76 |
| | | | 5971473.51 | 2648071.30 | 2708.00 | 2700.00 |
| | | | 5971480.82 | 2648031.81 | 2708.00 | 2700.00 |
| | | | 5971480.10 | 2647992.56 | 2708.00 | 2700.00 |
| | | | 5971476.89 | 2647953.43 | 2708.00 | 2700.00 |
| | | | 5971471.20 | 2647914.59 | 2705.79 | 2697.79 |
| | | | 5971463.05 | 2647876.18 | 2702.79 | 2694.79 |
| | | | 5971452.47 | 2647838.38 | 2699.95 | 2691.95 |
| | | | 5971404.54 | 2647724.79 | 2693.09 | 2685.09 |
| | | | 5971396.00 | 2647704.71 | 2693.03 | 2685.03 |
| | | | 5971388.95 | 2647684.06 | 2692.96 | 2684.96 |
| | | | 5971383.42 | 2647662.96 | 2693.52 | 2685.52 |
| | | | 5971379.44 | 2647641.51 | 2694.18 | 2686.18 |
| | | | 5971377.60 | 2647632.82 | 2694.22 | 2686.22 |
| | | | 5971377.24 | 2647623.95 | 2694.13 | 2686.13 |
| | | | 5971378.38 | 2647615.15 | 2693.91 | 2685.91 |
| | | | 5971380.99 | 2647606.66 | 2693.56 | 2685.56 |
| | | | 5971384.98 | 2647598.73 | 2693.09 | 2685.09 |
| | | | 5971390.24 | 2647591.58 | 2692.58 | 2684.58 |
| | | | 5971396.63 | 2647585.42 | 2692.16 | 2684.16 |
| | | | 5971413.44 | 2647575.76 | 2690.83 | 2682.83 |
| | | | 5971429.78 | 2647565.34 | 2689.53 | 2681.53 |
| | | | 5971429.29 | 2647548.51 | 2689.83 | 2681.83 |
| | | | 5971426.43 | 2647531.91 | 2690.35 | 2682.35 |
| | | | 5971367.94 | 2647526.06 | 2695.69 | 2687.69 |
| | | | 5971309.32 | 2647521.74 | 2701.02 | 2693.02 |
| | | | 5971250.60 | 2647518.95 | 2706.21 | 2698.21 |
| | | | 5971191.83 | 2647517.70 | 2710.70 | 2702.70 |
| | | | 5971045.48 | 2647530.80 | 2721.07 | 2713.07 |
| | | | 5970899.36 | 2647546.30 | 2733.03 | 2725.03 |
| | | | 5970806.20 | 2647572.01 | 2745.16 | 2737.16 |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | 5970712.67 | 2647596.36 | 2754.90 | 2746.90 |
| | | | | | 5970618.79 | 2647619.34 | 2763.81 | 2755.81 |
| | | | | | 5970585.51 | 2647626.17 | 2767.73 | 2759.73 |
| | | | | | 5970552.61 | 2647634.63 | 2772.25 | 2764.25 |
| | | | | | 5970520.17 | 2647644.70 | 2776.65 | 2768.65 |
| | | | | | 5970492.29 | 2647662.13 | 2780.03 | 2772.03 |
| | | | | | 5970465.70 | 2647681.48 | 2783.12 | 2775.12 |
| | | | | | 5970440.54 | 2647702.65 | 2785.91 | 2777.91 |
| | | | | | 5970416.93 | 2647725.54 | 2790.26 | 2782.26 |
| | | | | | 5970394.98 | 2647750.02 | 2793.58 | 2785.58 |
| | | | | | 5970360.29 | 2647790.33 | 2798.92 | 2790.92 |
| | | | | | 5970327.03 | 2647831.82 | 2803.31 | 2795.31 |
| | | | | | 5970295.23 | 2647874.45 | 2805.81 | 2797.81 |
| | | | | | 5970282.07 | 2647895.29 | 2806.55 | 2798.55 |
| | | | | | 5970270.84 | 2647917.23 | 2806.85 | 2798.85 |
| | | | | | 5970261.63 | 2647940.09 | 2806.76 | 2798.76 |
| | | | | | 5970254.52 | 2647963.68 | 2807.07 | 2799.07 |
| | | | | | 5970249.56 | 2647987.83 | 2806.95 | 2798.95 |
| | | | | | 5970246.80 | 2648012.32 | 2807.82 | 2799.82 |
| | | | | | 5970246.26 | 2648036.95 | 2808.43 | 2800.43 |
| | | | | | 5970247.93 | 2648061.54 | 2808.60 | 2800.60 |
| | | | | | 5970251.82 | 2648085.88 | 2808.33 | 2800.33 |
| | | | | | 5970257.88 | 2648109.77 | 2807.63 | 2799.63 |
| | | | | | 5970266.07 | 2648133.01 | 2806.18 | 2798.18 |
| | | | | | 5970275.00 | 2648161.76 | 2804.10 | 2796.10 |
| | | | | | 5970285.78 | 2648189.88 | 2801.39 | 2793.39 |
| | | | | | 5970298.34 | 2648217.23 | 2798.27 | 2790.27 |
| | | | | | 5970312.65 | 2648243.72 | 2794.82 | 2786.82 |
| | | | | | 5970328.64 | 2648269.23 | 2791.06 | 2783.06 |
| | | | | | 5970346.25 | 2648293.65 | 2787.36 | 2779.36 |
| | | | | | 5970365.39 | 2648316.89 | 2784.56 | 2776.56 |
| | | | | | 5970376.90 | 2648338.75 | 2782.64 | 2774.64 |
| | | | | | 5970386.54 | 2648361.50 | 2781.08 | 2773.08 |
| | | | | | 5970394.22 | 2648384.98 | 2780.50 | 2772.50 |
| | | | | | 5970399.91 | 2648409.03 | 2779.94 | 2771.94 |
| | | | | | 5970403.55 | 2648433.46 | 2779.66 | 2771.66 |
| | | | | | 5970405.13 | 2648458.12 | 2779.66 | 2771.66 |
| | | | | | 5970404.63 | 2648482.82 | 2779.93 | 2771.93 |
| | | | | | 5970402.06 | 2648507.39 | 2781.43 | 2773.43 |
| | | | | | 5970393.91 | 2648562.12 | 2785.43 | 2777.43 |
| | | | | | 5970388.08 | 2648617.15 | 2791.01 | 2783.00 |
| | | | | | 5970384.57 | 2648672.37 | 2799.58 | 2791.58 |
| | | | | | 5970383.40 | 2648727.69 | 2808.22 | 2800.22 |
| | | | | | 5970384.56 | 2648783.02 | 2817.68 | 2809.68 |
| | | | | | 5970388.05 | 2648838.24 | 2827.55 | 2819.55 |
| | | | | | 5970389.58 | 2648862.65 | 2832.62 | 2824.62 |
| | | | | | 5970393.26 | 2648886.82 | 2837.16 | 2829.16 |
| | | | | | 5970399.06 | 2648910.57 | 2840.95 | 2832.95 |
| | | | | | 5970406.94 | 2648933.72 | 2844.50 | 2836.50 |
| | | | | | 5970416.83 | 2648956.09 | 2847.49 | 2839.49 |
| | | | | | 5970428.66 | 2648977.49 | 2849.98 | 2841.98 |
| | | | | | 5970442.33 | 2648997.76 | 2852.19 | 2844.19 |
| AREASOURCE | 8.00 | r | | | 5971173.40 | 2647430.74 | 2710.35 | 2702.35 |
| | | | | | 5971296.54 | 2647428.69 | 2701.38 | 2693.38 |
| | | | | | 5971332.05 | 2647418.75 | 2698.40 | 2690.40 |
| | | | | | 5971363.20 | 2647402.09 | 2695.68 | 2687.68 |
| | | | | | 5971381.37 | 2647371.21 | 2693.58 | 2685.58 |
| | | | | | 5971375.55 | 2647327.98 | 2692.72 | 2684.72 |
| | | | | | 5971259.05 | 2647218.65 | 2693.22 | 2685.22 |
| | | | | | 5971226.65 | 2647211.55 | 2694.13 | 2686.13 |
| | | | | | 5971187.00 | 2647227.50 | 2696.88 | 2688.88 |
| | | | | | 5971122.40 | 2647276.15 | 2702.64 | 2694.64 |
| | | | | | 5971104.01 | 2647344.41 | 2708.41 | 2700.41 |
| | | | | | 5971111.51 | 2647386.76 | 2711.62 | 2703.62 |
| | | | | | 5971130.79 | 2647422.11 | 2712.35 | 2704.35 |
| AREASOURCE | 8.00 | r | | | 5969877.77 | 2647322.69 | 2775.68 | 2767.68 |
| | | | | | 5969889.23 | 2647295.93 | 2773.43 | 2765.43 |
| | | | | | 5969902.54 | 2647270.03 | 2771.01 | 2763.01 |
| | | | | | 5969917.61 | 2647245.12 | 2769.12 | 2761.12 |
| | | | | | 5969934.39 | 2647221.33 | 2767.03 | 2759.03 |
| | | | | | 5969952.78 | 2647198.76 | 2764.79 | 2756.79 |
| | | | | | 5969975.87 | 2647175.88 | 2761.89 | 2753.89 |
| | | | | | 5970000.28 | 2647154.43 | 2758.79 | 2750.79 |
| | | | | | 5970025.93 | 2647134.48 | 2755.22 | 2747.22 |
| | | | | | 5970052.72 | 2647116.10 | 2752.44 | 2744.44 |
| | | | | | 5970080.58 | 2647099.36 | 2749.54 | 2741.54 |
| | | | | | 5970109.38 | 2647084.32 | 2746.94 | 2738.94 |

| Name | Height | | | | Coordinates | | | |
|---|---|---|---|---|---|---|---|---|
| | Begin | | End | | x | y | z | Ground |
| | (ft) | | (ft) | | (ft) | (ft) | (ft) | (ft) |
| | | | | | 5970153.35 | 2647069.54 | 2743.22 | 2735.22 |
| | | | | | 5970198.06 | 2647057.20 | 2739.71 | 2731.71 |
| | | | | | 5970243.38 | 2647047.34 | 2736.02 | 2728.02 |
| | | | | | 5970259.27 | 2647045.54 | 2734.52 | 2726.52 |
| | | | | | 5970274.70 | 2647041.38 | 2733.12 | 2725.12 |
| | | | | | 5970289.32 | 2647034.93 | 2731.91 | 2723.91 |
| | | | | | 5970302.81 | 2647026.35 | 2730.89 | 2722.89 |
| | | | | | 5970314.85 | 2647015.84 | 2730.10 | 2722.10 |
| | | | | | 5970325.17 | 2647003.63 | 2729.56 | 2721.56 |
| | | | | | 5970346.49 | 2646971.02 | 2728.43 | 2720.43 |
| | | | | | 5970366.27 | 2646937.45 | 2727.26 | 2719.26 |
| | | | | | 5970384.48 | 2646903.00 | 2726.28 | 2718.28 |
| | | | | | 5970401.06 | 2646867.74 | 2725.49 | 2717.49 |
| | | | | | 5970370.55 | 2646860.65 | 2728.89 | 2720.89 |
| | | | | | 5970386.23 | 2646824.56 | 2728.21 | 2720.21 |
| | | | | | 5970388.68 | 2646806.87 | 2728.44 | 2720.44 |
| | | | | | 5970388.75 | 2646789.02 | 2728.82 | 2720.82 |
| | | | | | 5970386.44 | 2646771.31 | 2729.22 | 2721.22 |
| | | | | | 5970381.79 | 2646754.07 | 2729.85 | 2721.85 |
| | | | | | 5970298.72 | 2646590.43 | 2729.48 | 2721.48 |
| | | | | | 5970290.26 | 2646578.58 | 2728.63 | 2720.63 |
| | | | | | 5970280.02 | 2646568.23 | 2727.95 | 2719.95 |
| | | | | | 5970268.27 | 2646559.62 | 2727.44 | 2719.44 |
| | | | | | 5970255.31 | 2646552.99 | 2727.17 | 2719.17 |
| | | | | | 5970241.46 | 2646548.49 | 2727.12 | 2719.12 |
| | | | | | 5970227.07 | 2646546.25 | 2727.31 | 2719.31 |
| | | | | | 5970212.51 | 2646546.31 | 2728.00 | 2720.00 |
| | | | | | 5970198.14 | 2646548.69 | 2728.08 | 2720.08 |
| | | | | | 5970175.72 | 2646554.45 | 2728.99 | 2720.99 |
| | | | | | 5970153.88 | 2646562.11 | 2730.08 | 2722.08 |
| | | | | | 5970132.77 | 2646571.62 | 2731.34 | 2723.34 |
| | | | | | 5970112.56 | 2646582.90 | 2732.77 | 2724.77 |
| | | | | | 5970093.39 | 2646595.88 | 2734.34 | 2726.34 |
| | | | | | 5970075.41 | 2646610.45 | 2735.78 | 2727.78 |
| | | | | | 5969964.42 | 2646725.21 | 2748.00 | 2740.00 |
| | | | | | 5969733.02 | 2646911.47 | 2764.36 | 2756.36 |
| | | | | | 5969697.75 | 2646944.63 | 2768.00 | 2760.00 |
| | | | | | 5969678.11 | 2646972.28 | 2768.00 | 2760.00 |
| | | | | | 5969660.22 | 2647001.08 | 2768.41 | 2760.41 |
| | | | | | 5969644.13 | 2647030.94 | 2771.81 | 2763.81 |
| | | | | | 5969629.90 | 2647061.72 | 2775.53 | 2767.53 |
| | | | | | 5969617.60 | 2647093.32 | 2779.35 | 2771.35 |
| | | | | | 5969607.27 | 2647125.62 | 2783.19 | 2775.19 |
| | | | | | 5969598.95 | 2647158.50 | 2787.02 | 2779.02 |
| | | | | | 5969592.67 | 2647191.82 | 2788.00 | 2780.00 |
| | | | | | 5969588.45 | 2647225.47 | 2789.14 | 2781.14 |
| | | | | | 5969585.82 | 2647241.43 | 2791.28 | 2783.28 |
| | | | | | 5969585.22 | 2647257.60 | 2793.53 | 2785.53 |
| | | | | | 5969586.67 | 2647273.71 | 2795.86 | 2787.86 |
| | | | | | 5969590.13 | 2647289.51 | 2798.29 | 2790.29 |
| | | | | | 5969595.57 | 2647304.74 | 2800.72 | 2792.72 |
| | | | | | 5969602.88 | 2647319.17 | 2803.07 | 2795.07 |
| | | | | | 5969611.95 | 2647332.56 | 2805.31 | 2797.31 |
| | | | | | 5969624.79 | 2647344.60 | 2807.45 | 2799.45 |
| | | | | | 5969638.99 | 2647355.01 | 2808.09 | 2800.09 |
| | | | | | 5969654.34 | 2647363.63 | 2808.00 | 2800.00 |
| | | | | | 5969670.62 | 2647370.35 | 2808.00 | 2800.00 |
| | | | | | 5969687.58 | 2647375.06 | 2807.32 | 2799.32 |
| | | | | | 5969704.98 | 2647377.69 | 2805.39 | 2797.39 |
| | | | | | 5969732.47 | 2647379.31 | 2800.70 | 2792.70 |
| | | | | | 5969760.00 | 2647378.81 | 2795.99 | 2787.99 |
| | | | | | 5969787.41 | 2647376.21 | 2791.29 | 2783.29 |
| | | | | | 5969814.53 | 2647371.52 | 2786.67 | 2778.67 |
| | | | | | 5969832.83 | 2647362.57 | 2783.50 | 2775.50 |
| | | | | | 5969850.08 | 2647351.74 | 2780.53 | 2772.53 |
| | | | | | 5969866.11 | 2647339.17 | 2777.75 | 2769.75 |
| AREASOURCE | 8.00 | r | | | 5970158.97 | 2646361.22 | 2719.60 | 2711.60 |
| | | | | | 5970194.78 | 2646340.40 | 2717.22 | 2709.22 |
| | | | | | 5970231.66 | 2646321.55 | 2714.69 | 2706.69 |
| | | | | | 5970269.51 | 2646304.72 | 2711.41 | 2703.41 |
| | | | | | 5970308.22 | 2646289.96 | 2708.26 | 2700.25 |
| | | | | | 5970347.67 | 2646277.32 | 2705.51 | 2697.51 |
| | | | | | 5970372.17 | 2646271.61 | 2703.79 | 2695.79 |
| | | | | | 5970396.27 | 2646264.39 | 2702.13 | 2694.13 |
| | | | | | 5970419.88 | 2646255.67 | 2700.52 | 2692.52 |
| | | | | | 5970434.54 | 2646247.83 | 2699.56 | 2691.56 |
| | | | | | 5970447.82 | 2646237.81 | 2698.74 | 2690.74 |

| Name | Height | | Coordinates | | | |
|---|---|---|---|---|---|---|
| | Begin | End | x | y | z | Ground |
| | (ft) | (ft) | (ft) | (ft) | (ft) | (ft) |
| | | | 5970459.38 | 2646225.86 | 2698.07 | 2690.07 |
| | | | 5970468.96 | 2646212.26 | 2697.06 | 2689.06 |
| | | | 5970476.31 | 2646197.34 | 2696.17 | 2688.17 |
| | | | 5970481.27 | 2646181.46 | 2695.45 | 2687.45 |
| | | | 5970483.71 | 2646165.01 | 2694.93 | 2686.93 |
| | | | 5970483.58 | 2646148.38 | 2694.61 | 2686.61 |
| | | | 5970480.87 | 2646131.97 | 2694.51 | 2686.51 |
| | | | 5970475.65 | 2646116.17 | 2694.69 | 2686.69 |
| | | | 5970468.06 | 2646101.38 | 2695.37 | 2687.37 |
| | | | 5970458.26 | 2646087.94 | 2695.84 | 2687.84 |
| | | | 5970446.50 | 2646076.17 | 2696.17 | 2688.17 |
| | | | 5970433.07 | 2646066.37 | 2697.22 | 2689.22 |
| | | | 5970417.65 | 2646059.33 | 2698.43 | 2690.43 |
| | | | 5970401.51 | 2646054.15 | 2699.71 | 2691.71 |
| | | | 5970384.87 | 2646050.90 | 2701.03 | 2693.03 |
| | | | 5970367.97 | 2646049.64 | 2702.38 | 2694.38 |
| | | | 5970351.03 | 2646050.37 | 2703.74 | 2695.74 |
| | | | 5970093.64 | 2646060.80 | 2707.16 | 2699.16 |
| | | | 5969948.40 | 2646115.35 | 2706.09 | 2698.09 |
| | | | 5969943.51 | 2646118.44 | 2706.23 | 2698.23 |
| | | | 5969939.21 | 2646122.30 | 2706.53 | 2698.53 |
| | | | 5969935.60 | 2646126.81 | 2706.98 | 2698.98 |
| | | | 5969932.78 | 2646131.86 | 2707.58 | 2699.58 |
| | | | 5969930.84 | 2646137.30 | 2708.26 | 2700.26 |
| | | | 5969929.82 | 2646142.99 | 2708.97 | 2700.97 |
| | | | 5969929.76 | 2646148.77 | 2709.74 | 2701.74 |
| | | | 5969930.65 | 2646154.49 | 2710.57 | 2702.57 |
| | | | 5969949.47 | 2646179.72 | 2715.14 | 2707.14 |
| | | | 5969957.56 | 2646181.81 | 2715.92 | 2707.92 |
| | | | 5969965.87 | 2646182.52 | 2716.53 | 2708.53 |
| | | | 5970005.84 | 2646189.00 | 2719.89 | 2711.89 |
| | | | 5970014.20 | 2646192.53 | 2720.89 | 2712.89 |
| | | | 5970021.89 | 2646197.34 | 2722.01 | 2714.01 |
| | | | 5970028.71 | 2646203.33 | 2723.24 | 2715.24 |
| | | | 5970034.48 | 2646210.33 | 2724.21 | 2716.21 |
| | | | 5970039.05 | 2646218.16 | 2725.20 | 2717.20 |
| | | | 5970042.31 | 2646226.63 | 2726.26 | 2718.26 |
| | | | 5970044.17 | 2646235.51 | 2727.38 | 2719.38 |
| | | | 5970044.59 | 2646244.57 | 2728.00 | 2720.00 |
| | | | 5970035.68 | 2646323.42 | 2728.00 | 2720.00 |
| | | | 5970037.22 | 2646336.71 | 2728.00 | 2720.00 |
| | | | 5970040.29 | 2646349.73 | 2728.00 | 2720.00 |
| | | | 5970044.85 | 2646362.31 | 2728.00 | 2720.00 |
| | | | 5970050.84 | 2646374.27 | 2728.00 | 2720.00 |
| | | | 5970071.59 | 2646392.32 | 2727.02 | 2719.02 |
| | | | 5970084.97 | 2646398.23 | 2726.52 | 2718.52 |
| | | | 5970089.30 | 2646399.07 | 2726.28 | 2718.28 |
| | | | 5970093.71 | 2646399.24 | 2726.00 | 2718.00 |
| | | | 5970098.10 | 2646398.75 | 2725.66 | 2717.66 |
| | | | 5970102.36 | 2646397.61 | 2725.29 | 2717.29 |
| | | | 5970106.40 | 2646395.84 | 2724.90 | 2716.90 |
| | | | 5970110.13 | 2646393.49 | 2724.48 | 2716.48 |
| | | | 5970113.46 | 2646390.60 | 2724.05 | 2716.05 |

## Sound Level Spectra

| Name | ID | Type | Oktave Spectrum (dB) | | | | | | | | | | | | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weight. | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | lin | |
| Onsite Haul Pass-By | OS1 | Lw (c) | A | 78.6 | 76.8 | 80.8 | 81.3 | 89.9 | 87.8 | 86.1 | 81.7 | 72.0 | 94.1 | 118.2 | JN:9520 Lxt_Data_006 |
| Onsite Haul Truck Loading/Unloading | OS2 | Lw (c) | A | 59.0 | 82.5 | 91.7 | 93.5 | 94.2 | 96.0 | 91.9 | 85.0 | 78.0 | 101.0 | 112.3 | JN:9520 Lxt_Data_005 |
| Onsite Stockpiling | OS3 | Lw (c) | A | -10.9 | 2.3 | 12.4 | 19.9 | 25.3 | 111.2 | 29.7 | 29.5 | 27.4 | 111.2 | 111.2 | JN:12012 |

# APPENDIX 10.1:

# BLASTING CALCULATIONS

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# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 4181 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

**$SD_2$ = 836.20 ft/lbs$^{1/2}$**

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 836.20 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

**PPV = 0.00 in/sec**

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 4181 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

**$SD_3$ = 1429.88 ft/lbs$^{1/3}$**

**Air Overpressure Prediction**



URBAN CROSSROADS

**R1**

**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 1429.88 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0002 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0002 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 95.31 dB**

# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 3655 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_2$ = **731.00** ft/lbs$^{1/2}$

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 731.00 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

PPV = **0.00** in/sec

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 3655 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_3$ = **1249.99** ft/lbs$^{1/3}$

**Air Overpressure Prediction**



URBAN CROSSROADS

**R2**

**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 1249.99 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0002 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0002 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 96.60 dB**

# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 3674 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_2$ = **734.80** ft/lbs$^{1/2}$

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 734.80 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

PPV = **0.00** in/sec

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 3674 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_3$ = **1256.49** ft/lbs$^{1/3}$

**Air Overpressure Prediction**



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**R3**

**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 1256.49 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0002 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0002 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 96.55 dB**



URBAN CROSSROADS

# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 2272 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_2$ = **454.40** ft/lbs$^{1/2}$

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 454.40 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

PPV = **0.01** in/sec

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 2272 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_3$ = **777.01** ft/lbs$^{1/3}$

**Air Overpressure Prediction**



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**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 777.01 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0003 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0003 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 101.14 dB**

# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 2007 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

**$SD_2$ = 401.40 ft/lbs$^{1/2}$**

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 401.40 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

**PPV = 0.01 in/sec**

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 2007 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

**$SD_3$ = 686.38 ft/lbs$^{1/3}$**

**Air Overpressure Prediction**



URBAN CROSSROADS

**R5**

**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 686.38 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0004 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0004 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 102.33 dB**



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# BLASTING INPUTS & CALCULATIONS

## Scaled Distance

*Source: ISEE's Blaster's Handbook, 2018 Edition.*

**Square Root Scaled Distance**

$SD_2 = R / W^{1/2}$

| | | | |
|---|---|---|---|
| R = | 858 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_2$ = **171.60** ft/lbs$^{1/2}$

## Peak Particle Velocity

$PPV = A * (SD_2)^{-B}$

| | | |
|---|---|---|
| A = | 160 | **"Best Fit" 160 per blasting contractor guidance based on site conditions.** |
| $SD_2$ = | 171.60 | *All blasts will be designed on-site by the blasting contractor to remain below 0.5 in/sec PPV* |
| B = | 1.6 | Slope of the line (note that the slope is **negative** in the equation) |

PPV = **0.04** in/sec

**Vibration Amplitude Equations For Various Blasting Industries**

| Industry | Metric Equations mm/sec. | U.S. Equations in./sec. | Confidence level | Source |
|---|---|---|---|---|
| General | $PPV = 1{,}140(SD_2)^{-1.6}$ | $PPV = 160(SD_2)^{-1.6}$ | Best Fit | DuPont |
| Construction | $PPV = 173(SD_2)^{-1.6}$ | $PPV = 24.2(SD_2)^{-1.6}$ | Lower Bound | Oriard |
| Construction | $PPV = 1{,}730(SD_2)^{-1.6}$ | $PPV = 242(SD_2)^{-1.6}$ | Upper Bound | Oriard (2005) |
| Construction | $PPV = 4{,}320(SD_2)^{-1.6}$ | $PPV = 605(SD_2)^{-1.6}$ | Upper Bound - High Confinement | Oriard (2005) |
| Construction | $PPV = 53(SD_2)^{-1.09}$ | $PPV = 5(SD_2)^{-1.09}$ | Best Fit | USBM RI 8507 |
| Quarries | $PPV = 1{,}090(SD_2)^{-1.82}$ | $PPV = 182(SD_2)^{-1.82}$ | Best Fit | USBM Bulletin 656 |
| Coal Mines | $PPV = 905(SD_2)^{-1.52}$ | $PPV = 119(SD_2)^{-1.52}$ | Best Fit | USBM RI 8507 |
| Coal Mines | $PPV = 3{,}330(SD_2)^{-1.52}$ | $PPV = 438(SD_2)^{-1.52}$ | Upper bound | USBM RI 8507 |
| Coal - Low Frequency sites | $PPV = 1{,}252(SD_2)^{-1.31}$ | $PPV = 138(SD_2)^{-1.31}$ | Best Fit | USBM RI 9226 |

## Air Overpressure/Airblast

**Cubed Root Scaled Distance**

$SD_3 = R / W^{1/3}$

| | | | |
|---|---|---|---|
| R = | 858 | feet | Distance from blast to a point of intereste (meters or feet) |
| W = | 25 | lbs | Maximum charge-weigh detonated within any 8-millisecond period (kilograms or pounds) |

$SD_3$ = **293.43** ft/lbs$^{1/3}$

**Air Overpressure Prediction**



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**$P = A * SD_3^{-B}$**

| | | |
|---|---|---|
| A = | 0.5 | Partially confined. |
| $SD_3$ = | 293.43 | |
| B = | 1.1 | Slope of the line (note that the slope is negative) |

**P = 0.0010 psi**

**Air Overpressure Prediction Equations**

| Blasting | Metric Equations mb | U.S. Equations psi | Statistical Type | Source |
|---|---|---|---|---|
| Open air (no confinement) | $P = 3589 \times SD_3^{-1.38}$ | $P = 187 \times SD_3^{-1.38}$ | Best Fit | Perkins |
| Coal mines (parting) | $P = 2596 \times SD_3^{-1.62}$ | $P = 169 \times SD_3^{-1.62}$ | Best Fit | USBM RI 8485 |
| Coal mines (highwall) | $P = 5.37 \times SD_3^{-0.79}$ | $P = 0.162 \times SD_3^{-0.79}$ | Best Fit | USBM RI 8485 |
| Quarry face | $P = 37.1 \times SD_3^{-0.97}$ | $P = 1.32 \times SD_3^{-0.97}$ | Best Fit | USBM RI 8485 |
| Metal Mine | $P = 14.3 \times SD_3^{-0.71}$ | $P = 0.401 \times SD_3^{-0.71}$ | Best Fit | USBM RI 8485 |
| Construction (average) | $P = 24.8 \times SD_3^{-1.1}$ | $P = 1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Construction (highly confined) | $P = 2.48 \times SD_3^{-1.1}$ | $P = 0.1 \times SD_3^{-1.1}$ | Best Fit | Oriard (2005) |
| Buried (total confinement) | $P = 1.73 \times SD_3^{-0.96}$ | $P = 0.061 \times SD_3^{-0.96}$ | Best Fit | USBM RI 8485 |

**Decibels (Linear)**

**$P_s = 20 * \log(P / P_0)$**

| | | |
|---|---|---|
| P = | 0.0010 psi | |
| $P_0$ = | 2.9E-09 pascals | Reference value: $2.9 * 10^{-9}$ lbs/inch$^2$ |

**$P_s$ = 110.45 dB**

Appendix K

# Trip Generation Assessment

December 3, 2021 (Revised)

Mr. Frank Amendola
Lilburn Corporation
1905 Business Center Drive
San Bernardino, CA 92408

**SUBJECT: GEM HILL QUARRY TRIP GENERATION ASSESSMENT (REVISED)**

Dear Mr. Frank Amendola:

Urban Crossroads, Inc. is pleased to provide the following Trip Generation Assessment for Gem Hill Quarry which is located west of Mojave Tropico Road in the County of Kern. The purpose of this work effort is to assess the potential changes in trip generation associated with the proposed Project.

## PROPOSED PROJECT

The proposed Project is to consist of the reclamation and operation of a 35-acre quarry within a 210-acre site. The Project is proposing a permit that would allow up to 500,000 tons per year (TPY) maximum annual production quantity. A daily tonnage of 1,667 tons per day (TPD) is assumed based on 300 working days per year. Based on a daily tonnage of 1,667 TPD, there are 67 trucks anticipated per day, or 134 truck trips (two-way trucks, inbound and outbound). Approximately 7 trucks are anticipated to leave and return each hour, with the last trucks leaving between 4-5 PM. The site will have up to 10 employees with all employees would arrive on-site prior to trucks (or by 7 AM) and departing for the day after 5 PM. Product (pozzolan) will be transported via 25-ton street-legal haul trucks from the site to various off-site destinations. There will also be one 3-axle water truck transporting water to the site, with one inbound trip prior to 7 AM, with none during 7-9 AM or any time after 4 PM.

The proposed Project would have access to Mojave Tropico Road. The street-legal haul trucks with a capacity of approximately 25 tons will exist the site on the main access road and travel north on Mojave Tropico Road for 2.5 miles with approximately 75% of trucks traveling west on Backus Road, northwest on Willow Springs Road for 8 miles, and east on Oak Creek Road for 3.5 miles to the Mojave Plane entrance with the remaining 25% traveling east on Backus Road to SR-14 and then traveling to various client locations. Note that the distance to the Mojave Plan is approximately 18.7 miles, all along County-maintained roads.

## TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The Institute of Transportation Engineers (ITE) Trip Generation

Manual (10th Edition, 2017) is a nationally recognized source for estimating site specific trip generation. As the proposed Project's land use is rather unique and not comparable to any ITE Trip Generation Manual rates, the traffic generating potential of the proposed Project has been estimated based on the annual production anticipated for the Project.

An estimated daily production quantity of 1,667 TPD has been determined to be a reasonable high-end and conservative estimate for purposes of evaluating potential impacts. As shown in Table 1, based on an operations schedule of 300 working days per year, the quarry could operate at the conservatively estimated 1,667 TPD production level each day and stay within the proposed permitted annual limit of 500,000 TPY.

**TABLE 1: DATA TO SUPPORT 1,667 TONS PER DAY ASSUMPTION**

| Annual Tonnage at 1,667 TPD | |
|---|---|
| A. Proposed Daily Tonnage (TPD): | 1,667 TPD[1] |
| B. Working Days Per Year: | 300 Days |
| C. Total Annual Tonnage at 2,000 TPD (A. X B.): | 500,000 TPY[2] |

[1] TPD = Tons Per Day

[2] TPY = Tons Per Year

Table 2 illustrates the breakdown of truck trips associated with the conservative estimate of 1,667 TPD. As indicated in Table 2, the proposed Project is estimated to generate 134 daily truck trips (two-way trips, or 67 trucks per day).

**TABLE 2: PROJECT DAILY TRUCK TRIPS**

| | |
|---|---|
| A. Proposed Daily Tonnage (TPD): | 1,667 TPD |
| B. Average Tons Per Truck: | 25 Tons |
| C. One-Way Trucks Per Day (A. / B.): | 67 Trucks |
| D. Total Two-Way Total Trucks Per Day Based on 1,667 TPD (C. X 2-trips)[1]: | 134 Trucks[1] |

[1] Total trucks based on 1,667 TPD. Total trucks per day multiplied by 2.0 to represent two-way trip ends (one inbound trip and one outbound trip).

Based on the anticipated operations of the site (arrival and departure of employees and trucks), the Project trip generation is summarized in Table 3. A PCE factor has been applied to the trip generation rates for heavy trucks. PCE factors allow the typical "real-world" mix of vehicle types to be represented as a single standardized unit, such as the passenger car, for the purposes of capacity and level of service analysis. A PCE factor of 3.0 has been applied to large 4+ axle trucks that are typically used to haul naturally mined minerals similar to pozzolan. As shown in Table 3, the Project is anticipated to generate a total of approximately 422 PCE trip-ends per day with 42 PCE AM peak hour and 31 PCE PM peak hour trips.

**TABLE 3: PROJECT TRIP GENERATION SUMMARY**

| Land Use/Project | Quantity | Units[1] | AM Peak Hour | | | PM Peak Hour | | | Daily |
|---|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total | |
| Gem Hill Quarry | 0.500 | MTPY | | | | | | | |
| Passenger Cars | | | 0 | 0 | 0 | 0 | 10 | 10 | 20 |
| Truck Trips[2] | | | 7 | 7 | 14 | 0 | 7 | 7 | 134 |
| **Project Trips (PCE)[3]** | | | **21** | **21** | **42** | **0** | **31** | **31** | **422** |

[1] MTPY = Million Tons Per Year

[2] Total project truck trips based on typical peak operating day of 1,667 tons per day.

[3] Based on passenger car equivalent (PCE) factor of 3.0 PCE per truck.

Pursuant to the County of Kern Division 9 (Standards for Traffic Engineering, 902-1.02), a Project within the Rosamond-Willow Springs Specific Plan where the increase in project trip generation during any peak hour is expected to exceed 50 peak hour trips requires a traffic study unless waived by the Kern County Public Works Department. As shown on Table 3, the proposed Project is anticipated to generate fewer than 50 PCE-based peak hour trips during the morning and evening peak hours. As such, additional traffic analysis does not appear necessary based on the County's guidelines.

If you have any questions, please contact me directly at (949) 861-0177.

Respectfully submitted,

URBAN CROSSROADS, INC.

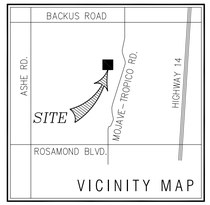
Charlene So

Charlene So, PE
Associate Principal



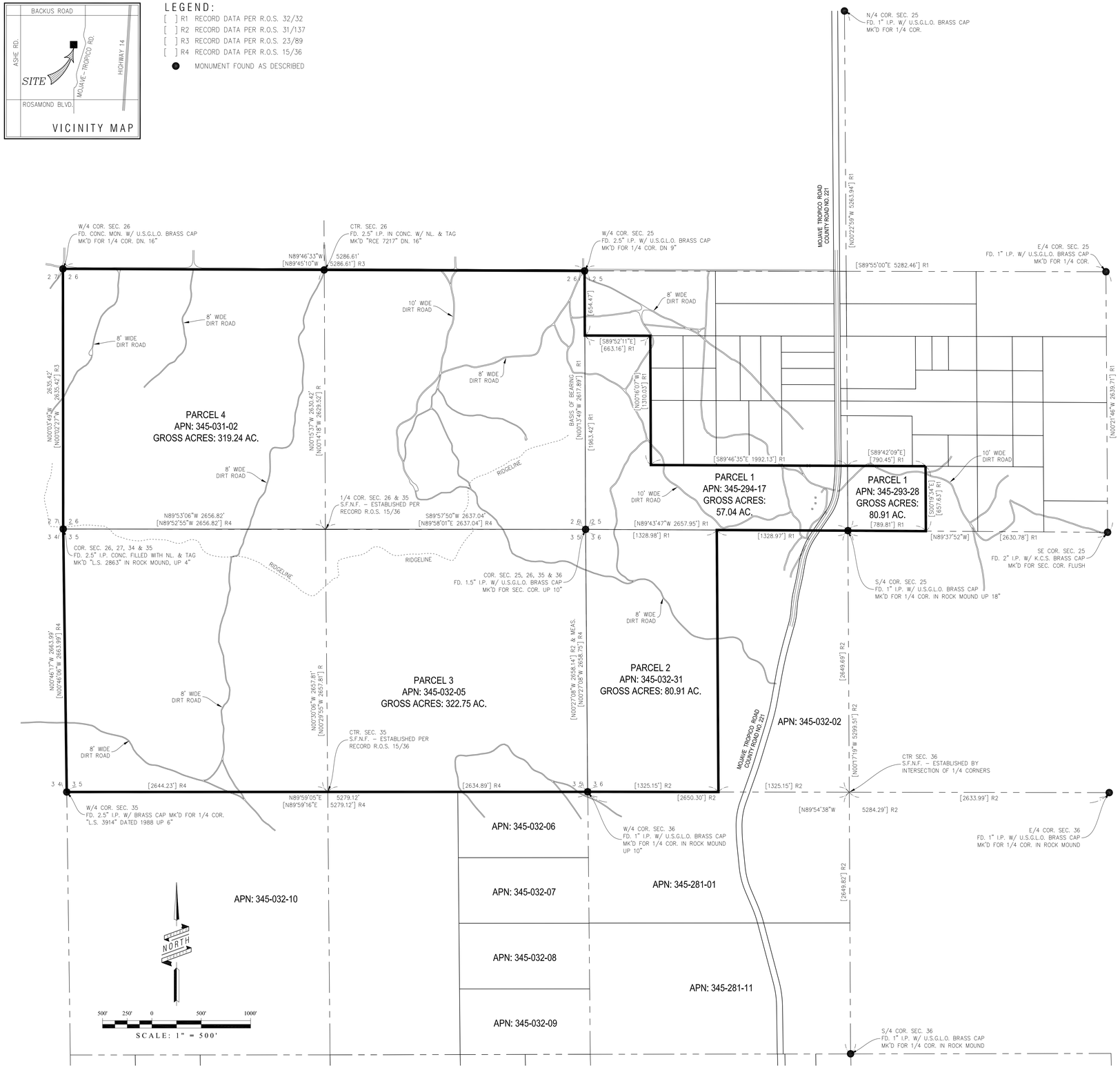
Appendix L

# Land Survey Map




LEGEND:

[ ] R1 RECORD DATA PER R.O.S. 32/32
[ ] R2 RECORD DATA PER R.O.S. 31/137
[ ] R3 RECORD DATA PER R.O.S. 23/89
[ ] R4 RECORD DATA PER R.O.S. 15/36
● MONUMENT FOUND AS DESCRIBED




## OWNER(S):

TITLE TO SAID ESTATE OR INTEREST AT THE DATE HEREOF IS VESTED IN:

APN 345-294-17: CALPORTLAND COMPANY, A CALIFORNIA CORPORATION
APN 345-293-28: CALPORTLAND COMPANY, A CALIFORNIA CORPORATION } PARCEL 1

APN 345-032-31: CALPORTLAND COMPANY, A CALIFORNIA CORPORATION – PARCEL 2

APN 345-032-05: CALPORTLAND COMPANY, A CALIFORNIA CORPORATION – PARCEL 3

APN 345-031-02: CALPORTLAND COMPANY – PARCEL 4

## LEGAL DESCRIPTION:

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE COUNTY OF KERN, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

PARCEL 1: (APN 345-294-17-00 AND 345-293-28-00)
THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE WEST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTH HALF OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER; THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER; AND THE WEST 2 ACRES OF THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 25, TOWNSHIP 10 NORTH, RANGE 13 WEST SAN BERNARDINO MERIDIAN, IN THE UNINCORPORATED AREA OF THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.
EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO BERTHA M. FERRELL, AN UNMARRIED WOMAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 297 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 1/32TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO REGINALD L. DYER AND LUCETTE DYER, HIS WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 295 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 1/16TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JAMES RIGA AND PEACHES RIGA, HUSBAND AND WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 299 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO CHARLES C. ASHURST AND EMMA ASHURST, HUSBAND AND WIFE AS JOINT TENANTS, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 301 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 1/32ND INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JOHN H. SULLIVAN, AN UNMARRIED MAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 303 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 1/16TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO WALTER H. SULLIVAN, AN UNMARRIED MAN, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 305 OF OFFICIAL RECORDS.
ALSO EXCEPT AN UNDIVIDED 3/40TH INTEREST IN AND TO ALL OIL, GAS MINERALS AND OTHER HYDROCARBON SUBSTANCES IN AND UNDER SAID LAND, AS GRANTED TO JAMES R. DAVIS AND BROWNIE I. DAVIS, HIS WIFE, IN DEED RECORDED SEPTEMBER 16, 1958 IN BOOK 3007, PAGE 307 OF OFFICIAL RECORDS.

PARCEL 2: (APN 345-032-31-00)
THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 10 NORTH, RANGE 13 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT THEREOF.

PARCEL 3: (APN 345-032-05-00)
THE NORTH HALF OF SECTION 35, TOWNSHIP 10 NORTH, RANGE 13 WEST, SAN BERNARDINO MERIDIAN, IN THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF SAID LAND APPROVED BY THE SURVEYOR GENERAL FEBRUARY 19, 1856.
THE PLAT OF THE DEPENDENT RESURVEY OF SAID TOWNSHIP WAS FILED IN THE DISTRICT LAND OFFICE OCTOBER 7, 1936.

PARCEL 4: (APN 345-031-02-00)
THE SOUTH HALF OF SECTION TWENTY-SIX, TOWNSHIP 10 NORTH, RANGE THIRTEEN WEST, S.B.B.M., IN THE COUNTY OF KERN, STATE OF CALIFORNIA, ACCORDING TO THE OFFICIAL PLAT OF THE SURVEY OF THE SAID LAND, RETURNED TO THE GENERAL LAND OFFICE BY THE SURVEYOR GENERAL.

## BASIS OF BEARINGS:

THE BEARING OF NORTH 00°13'49" WEST FOR THE WEST LINE OF THE SOUTHWEST ONE-QUARTER OF SECTION 25, TOWNSHIP 10 NORTH, RANGE 13 WEST, SAN BERNARDINO MERIDIAN, AS SHOWN ON RECORD OF SURVEY MAP FILED IN BOOK 32, PAGE 32, WAS USED FOR THE BASIS OF BEARINGS FOR THIS MAP.

## FLOOD HAZARD NOTE:

THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD RATE MAP FOR COMMUNITY NO. 060075, PANEL NO. 3675E, DATED SEPTEMBER 26, 2008 SHOWS THAT THE LOCATION OF THIS SITE FALLS WITHIN ZONE X, WHICH ARE AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

## UTILITY NOTE:

THE UNDERGROUND UTILITIES (IF ANY) THAT APPEAR ON THIS MAP HAVE BEEN LOCATED BY FIELD OBSERVATION. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES STATE THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.

## SURVEYOR'S FINDINGS:

1. DURING THE COURSE OF THE FIELDWORK, THE SURVEYOR FOUND VISIBLE EVIDENCE THAT ALL PARCELS ARE ACTIVELY BEING USED FOR RECREATIONAL PURPOSES, SUCH AS OFF-ROAD TRAILS, HIKING TRAILS AND/OR FIREARM TARGETING SITES.
2. THE SURVEYOR LOCATED THREE (3) MINE SHAFT OPENINGS WITHIN PARCEL 1 AS SHOWN HEREON. NO OBSERVBLE EVIDENCE OF ACTIVE USE.
3. ACCESS TO PARCEL 1 IS VIA MOJAVE TROPICO ROAD, WHICH IS A PUBLIC RIGHT-OF-WAY THAT RUNS THROUGH SAID PARCEL.
4. PARCELS 2-4 APPEAR TO LACK LEGAL ACCESS TO OR FROM A PUBLIC RIGHT-OF-WAY.
5. THE GRANT DEED RECORDED MARCH 22, 1912 IN BOOK 271, PAGE 1 OF DEEDS, RESERVES A RIGHT-OF-WAY FOR COUNTY ROADS "IN PUBLIC USE" WHICH MAY EXIST ACROSS ANY OF THE HUNDREDS OF PARCELS OF LAND LISTED IN THE DEED, BASED ON VISUAL INSPECTION, THERE DOES NOT APPEAR TO BE ANY EVIDENCE OF A COUNTY ROAD HAVING EVER EXISTED AND THEREFORE DOES NOT APPLY TO THE SUBJECT PROPERTIES SHOWN HEREON.
6. THE TITLE REPORT NOTES THAT THE BOUNDARIES OF SECTION 35 SHOWN ON THE OFFICIAL PLAT APPROVED FEBUARY 19, 1856 ARE NOT IDENTICAL TO THE BOUNDARIES SHOWN ON THE DEPENDENT RESURVEY APPROVED JUNE 19, 1935. BOTH SURVEYS WERE CONDUCTED BY THE UNITED STATES GOVERNMENT, IN ACCORDANCE TO SURVEY RULES DEFINED IN THE MANUAL OF SURVEYING INSTRUCTIONS, CHAPTER 5, SECTION 10, WHICH STATES:
"A DEPENDENT RESURVEY IS A RETRACEMENT AND REESTABLISHMENT OF THE LINES OF THE ORIGINAL SURVEY IN THEIR TRUE ORIGINAL POSITIONS ACCORDING TO THE BEST AVAILABLE EVIDENCE OF THE POSITIONS OF THE ORIGINAL CORNERS. THE SECTION LINES OF THE DEPENDENT RESURVEY REPRESENT THE BEST POSSIBLE IDENTIFICATION OF THE TRUE LEGAL BOUNDARIES OF LANDS ALIENATED ON THE BASIS OF THE PLAT OF THE ORIGINAL SURVEY, IN LEGAL CONTEMPLATION AND IN FACT, THE LANDS CONTAINED IN A CERTAIN SECTION OF THE ORIGINAL SURVEY AND THE LANDS CONTAINED IN THE CORRESPONDING SECTION OF THE DEPENDENT RESURVEY ARE IDENTICAL." THIS IS INTERPRETED TO MEAN THAT THE DIFFERENCE IN MEASUREMENTS SHOWN ON THE 1856 PLAT VERSUS THOSE MEASUREMENTS SHOWN ON THE 1935 PLAT DO NOT ALTER THE LOCATION OF LINES OR BOUNDARIES OF SECTION 35. INSTEAD, THE 1935 PLAT SIMPLY PROVIDES UPDATED INFORMATION BASED ON A RESURVEY OF THE ORIGINAL LINES AND CORNERS SET BY THE 1856 PLAT. THEFEFORE THE BOUNDARIES OF SECTION 35 SHOWN ON BOTH PLATS ARE IDENTICAL REGARDLESS OF MEASUREMENT DIFFERENCES.

## SURVEYOR'S CERTIFICATE:

TO: CALPORTLAND COMPANY AND CHICAGO TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 "MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS", JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 3, 4, 8, 11, AND 13 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON SEPTEMBER 14, 2018.

01.23.2020
DATE OF PLAT OR MAP

D'ARTAGNAN ALBA
CALIFORNIA PROFESSIONAL LAND SURVEYOR
P.L.S. NO. 9052

LICENSED LAND SURVEYOR
D'Artagnan Alba
L.S. 9052
STATE OF CALIFORNIA

PREPARED BY:
SMITHCO
SURVEYING/ENGINEERING
P.O. BOX 81626 BAKERSFIELD, CA 93380
PHONE: (661) 393-1217 FAX: (661) 393-1218

PREPARED FOR:
CALPORTLAND

PROJECT:
A.L.T.A./N.S.P.S. LAND TITLE SURVEY
PORTIONS OF SECTIONS 25, 26, 35 & 36,
TOWNSHIP 10 NORTH, RANGE 13 WEST, S.B.M.
UNINCORPORATED AREA OF THE COUNTY OF KERN
STATE OF CALIFORNIA

| REV.# | DATE | DESCRIPTION | BY: |
|---|---|---|---|
| 0 | 01/23/20 | PRELIMINARY ISSUE | SL |
| 1 | 01/23/20 | REVISIONS | SL |

SMITHCO JOB NO.: 56-739

SHEET 1 OF 1