



# INITIAL STUDY/ENVIRONMENTAL CHECKLIST

**PROJECT TITLE:** Vic Trace Reservoir Replacement Project

**APPLICATION NUMBER:** PRE2025-0035

**DATE:** Thursday, November 13, 2025

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## APPLICANT/ PROPERTY OWNER

Applicant: City of Santa Barbara, Public Works Department

Applicant Representative(s): Kelly Bourque, Senior Project Engineer

Owner(s): City of Santa Barbara

## PROJECT ADDRESS/LOCATION

The Project site encompasses the Vic Trace Reservoir parcel and various water infrastructure improvements in the Alta Mesa neighborhood in the City of Santa Barbara, California.

The Vic Trace Reservoir parcel covers approximately 15 acres (14.726 acres) and is located on City-owned property at 740 Dolores Drive, Santa Barbara (Assessor's Parcel Number [APN] 035-033-031). The parcel contains existing water infrastructure facilities, existing City communication facilities, and La Coronilla Park. Access to the Vic Trace Reservoir parcel is from La Coronilla Drive between residences at 1617 and 1633 La Coronilla Drive via an existing 20-foot-wide easement through the 1617 La Coronilla Drive property.

Underground water main pipeline (main) work is proposed within the public right-of-way (ROW) paved roadways near the Vic Trace Reservoir Parcel, including La Coronilla Drive, Dolores Drive, Ricardo Avenue, La Vista Del Oceano, and Meigs Road. For a tabular summary of the Project components, refer to Table 1 Location of Project Components.

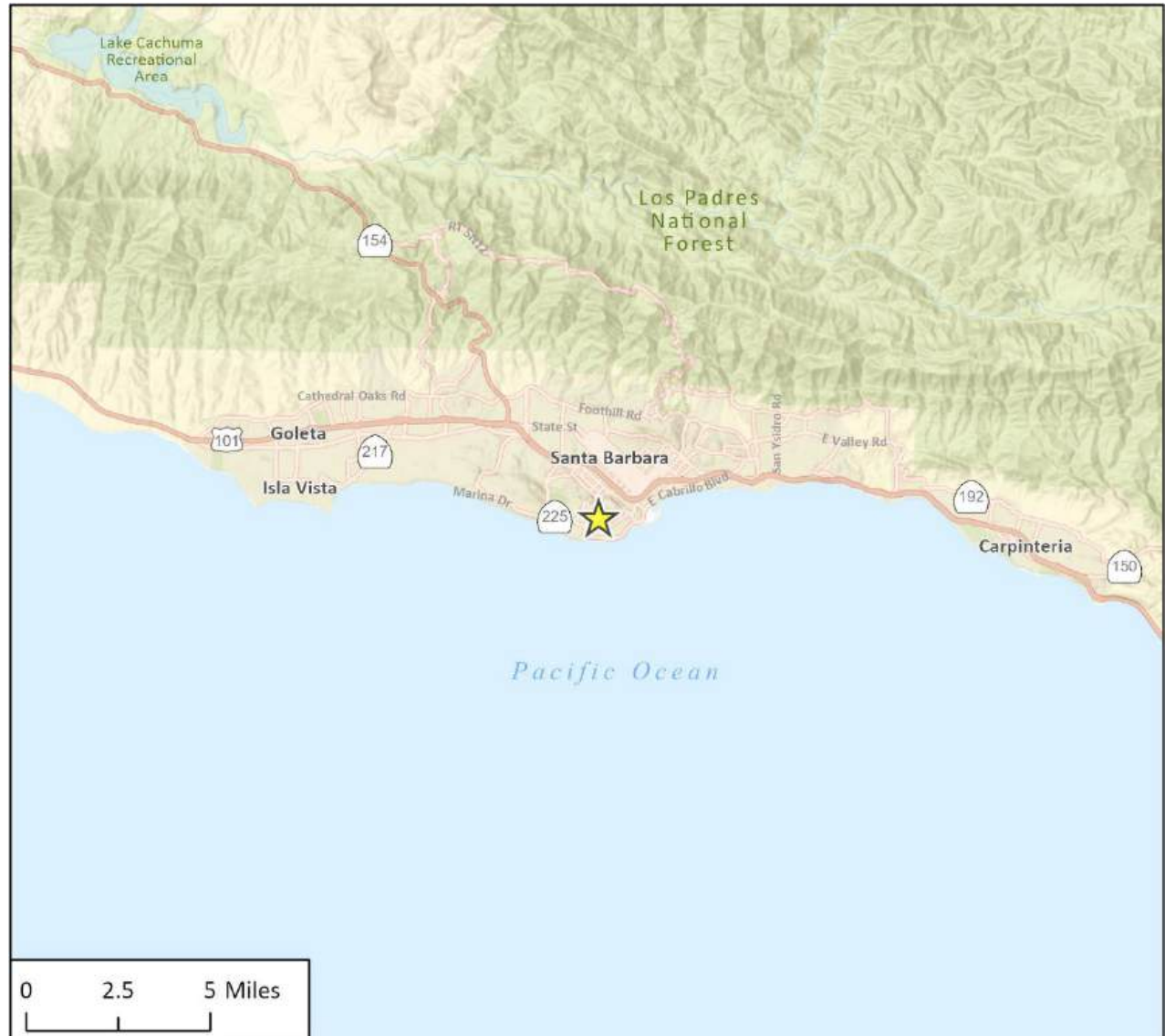
**Table 1 Location of Project Components**

| Project Components                                                             | Location                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vic Trace Reservoir Parcel Improvements</b>                                 |                                                                                                                                                                                                                             |
| Vic Trace Reservoir Parcel Improvements and Reservoir Replacement              | 740 Dolores Drive, Santa Barbara (APN 035-033-031)                                                                                                                                                                          |
| <b>Offsite Improvements</b>                                                    |                                                                                                                                                                                                                             |
| Relocated La Coronilla Transmission Main                                       | Public ROW in roadway from intersection of Meigs Road westward to Vic Trace Reservoir driveway entrance                                                                                                                     |
| Replaced Vic Trace Outlet Water Main                                           | Public ROW in roadway from Vic Trace Reservoir driveway entrance west along La Coronilla Drive, then south along Dolore Drive to the intersection of Meigs Road and Dolores Drive, then south on Meigs Road to Red Rose Way |
| Replaced Dolores Drive Water Main                                              | Public ROW in road from intersection of La Coronilla Drive and Dolores Drive southwest towards Meigs Road                                                                                                                   |
| New Ricardo Avenue Water Main                                                  | Public ROW in roadway from the intersection of Dolores Drive and Ricardo Avenue westward towards La Vista Del Oceano                                                                                                        |
| Entry/Exit Pits for La Vista Del Oceano Water Main Lining                      | Public ROW in roadway – temporary entry pit located in roadway at 652 Ricardo Avenue, temporary exit pit located in roadway west of 1528 La Vista Del Oceano                                                                |
| Existing PRV Station (to be abandoned)                                         | Public ROW in roadway west of 1521 La Vista Del Oceano                                                                                                                                                                      |
| Proposed PRV Station (to be constructed)                                       | Public ROW east of intersection of Dolores Drive and Meigs Road on Dolores Drive between curb and private property at 1740 Cliff Drive                                                                                      |
| ROW = right of way<br>Main = water pipeline<br>PRV = pressure regulating valve |                                                                                                                                                                                                                             |

Construction access routes are described in *Construction Staging and Traffic*.

Figure 1 Regional Location, displays the regional location of the Project site, and Figure 2 Project Site Location, displays the location within a neighborhood context. Figure 3 Topographic Map shows a topographic map of the Project site.

**Figure 1 Regional Location**



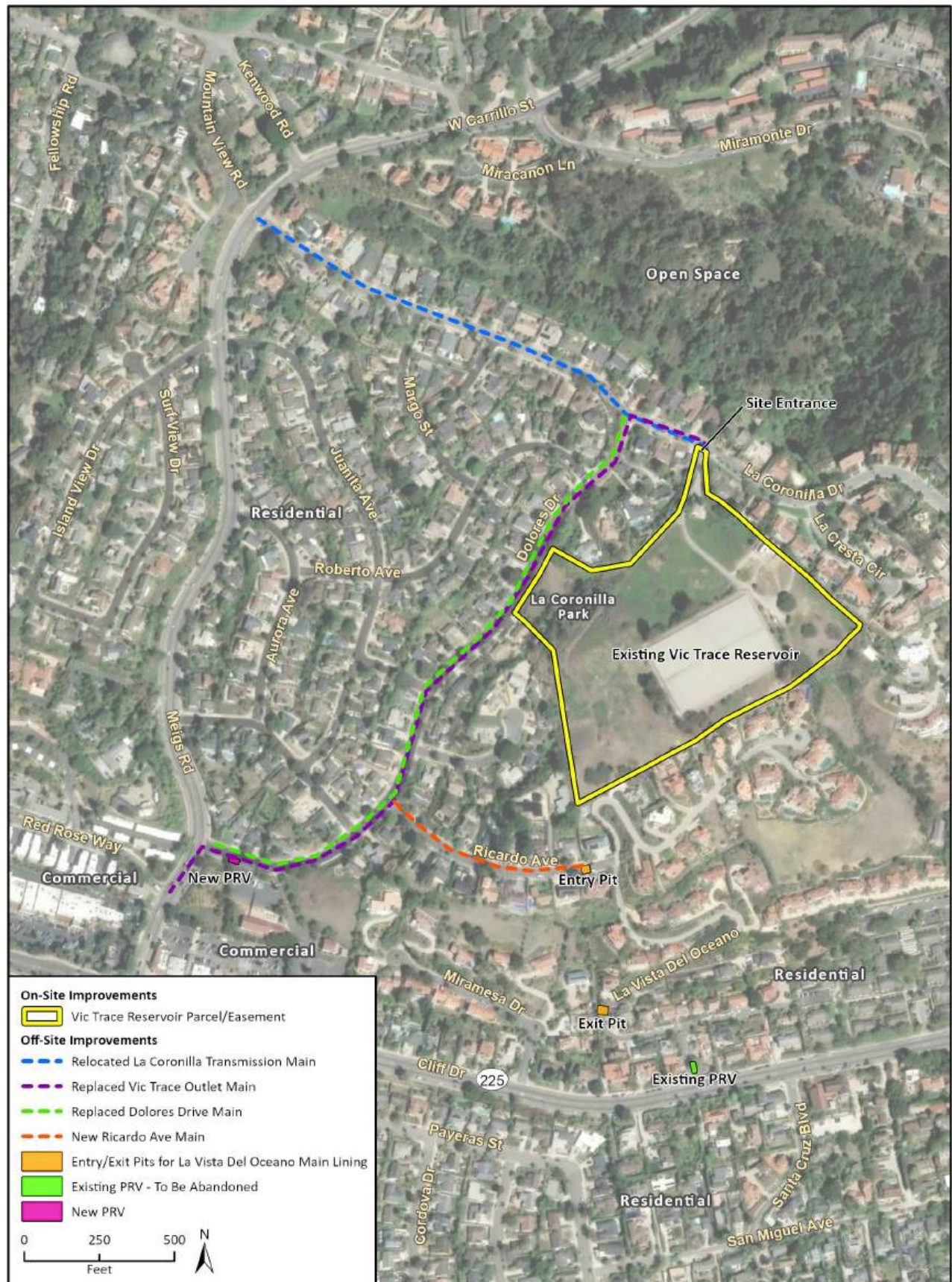
Imagery provided by Esri and its licensors © 2025.

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Fig. 1 Regional Location

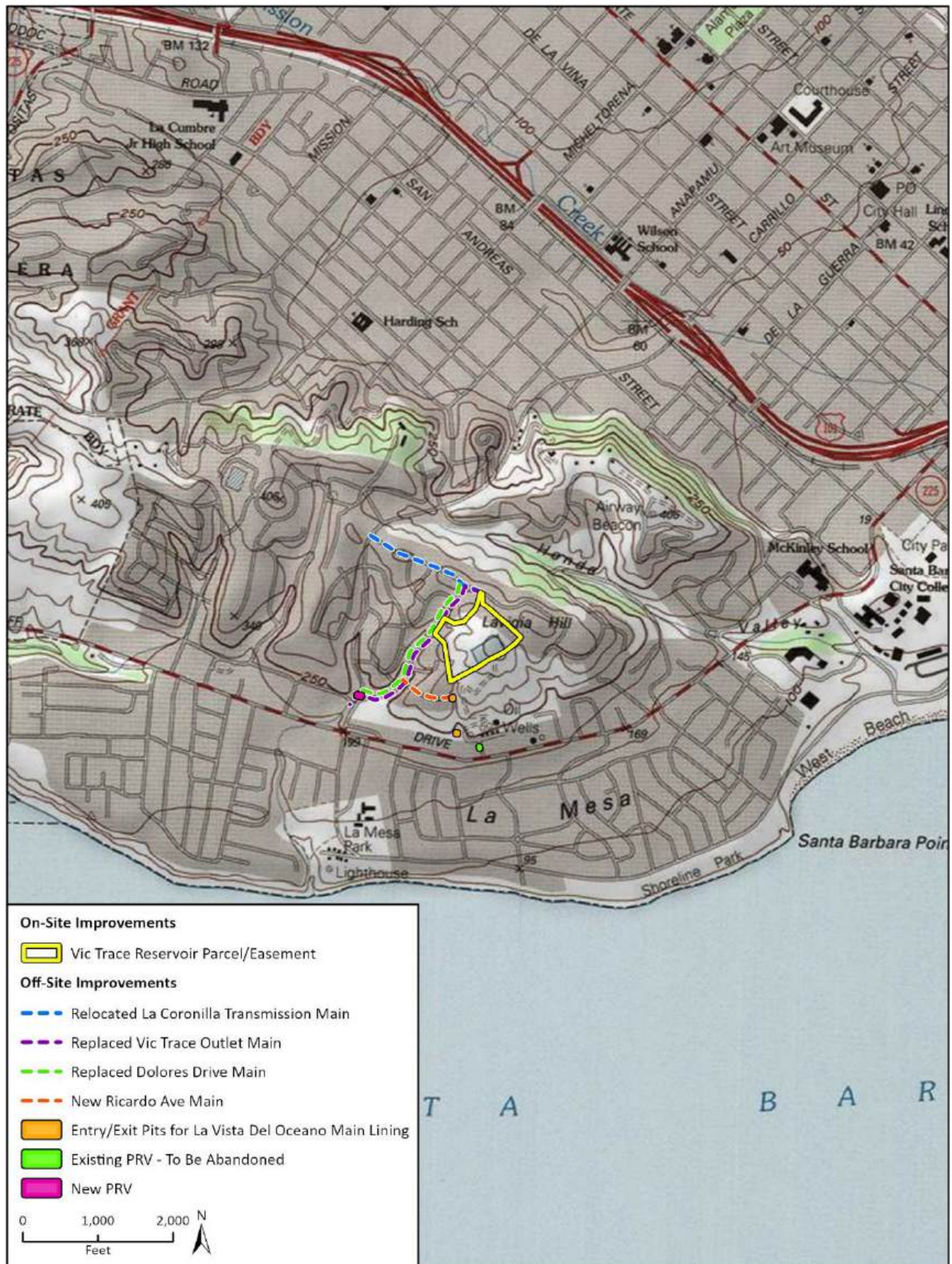
★ Project Location



**Figure 2 Project Site Location**



**Figure 3 Topographic Map**



## PROJECT DESCRIPTION

### Project Objectives

Originally constructed in 1956, Vic Trace Reservoir is the City of Santa Barbara's largest water storage reservoir. It serves as a vital component of the City's water distribution system, serving nearly 60,000 people or approximately 70% of Santa Barbara's population.

In 2021, the City's Water Distribution Infrastructure Plan (WDIP) developed recommendations to address the City's water distribution and supply needs through 2050. The WDIP recommended replacement of Vic Trace Reservoir due to its age, increasing repair needs, and importance to the City's overall water storage portfolio. Related offsite water infrastructure improvements in the Alta Mesa neighborhood were also identified to replace aging infrastructure, improve water system hydraulics, and address worker safety issues (safe facility ingress and egress).

Pursuant to CEQA Guidelines Section 15124(b), an Environmental Impact Report (EIR) shall contain a statement of objectives sought by the proposed Project. The objectives of the proposed Project include the following:

- Replace and upgrade aging water infrastructure to ensure safe and reliable drinking water;
- Improve existing facilities and install new facilities to enhance the operational reliability and resiliency, minimize the risk of future facility failures, and optimize hydraulics and operations of Vic Trace Reservoir and the City's water system;
- Maintain critical demand capacity (e.g., peak demands, structure fires, human consumption) and system pressure city-wide;
- Address updated federal regulations that require more robust security for water infrastructure; and
- Maintain the City's ability to store a large amount of water locally, which is a key element of Santa Barbara's strategy to remain resilient and resistant to local emergencies or other climate change-related issues (e.g., drought, storms, wildfires).

### Project Characteristics

The proposed Project includes the following main elements:

- **Vic Trace Reservoir Parcel Improvements:** Replacement of the existing 10 million gallon (MG) Vic Trace Reservoir with two 5 MG reservoirs at the same site, re-abandonment of the abandoned oil well, building replacements, earthwork, and site improvements on the parcel, including possible renewable energy generation and storage.
- Offsite Improvements:
  - **Underground Water Mains:** Replacements, repairs, abandonments, and relocations of aging water mains in neighborhood areas near the Vic Trace Reservoir parcel.
  - **Underground Pressure Regulating Valve (PRV) Station Relocation:** Relocation of the reservoir's downstream PRV station to an improved location with safer entry.

Project elements are described in detail in the following sections. Figure 4 shows the proposed overall site plan for the Vic Trace Reservoir parcel. Figure 5 shows the proposed landscape plan. Figure 6 and Figure 7 show visual renderings of the proposed Project improvements (at preliminary design phase) on the Vic Trace Reservoir parcel.

### Figure 4 Project Site Plan

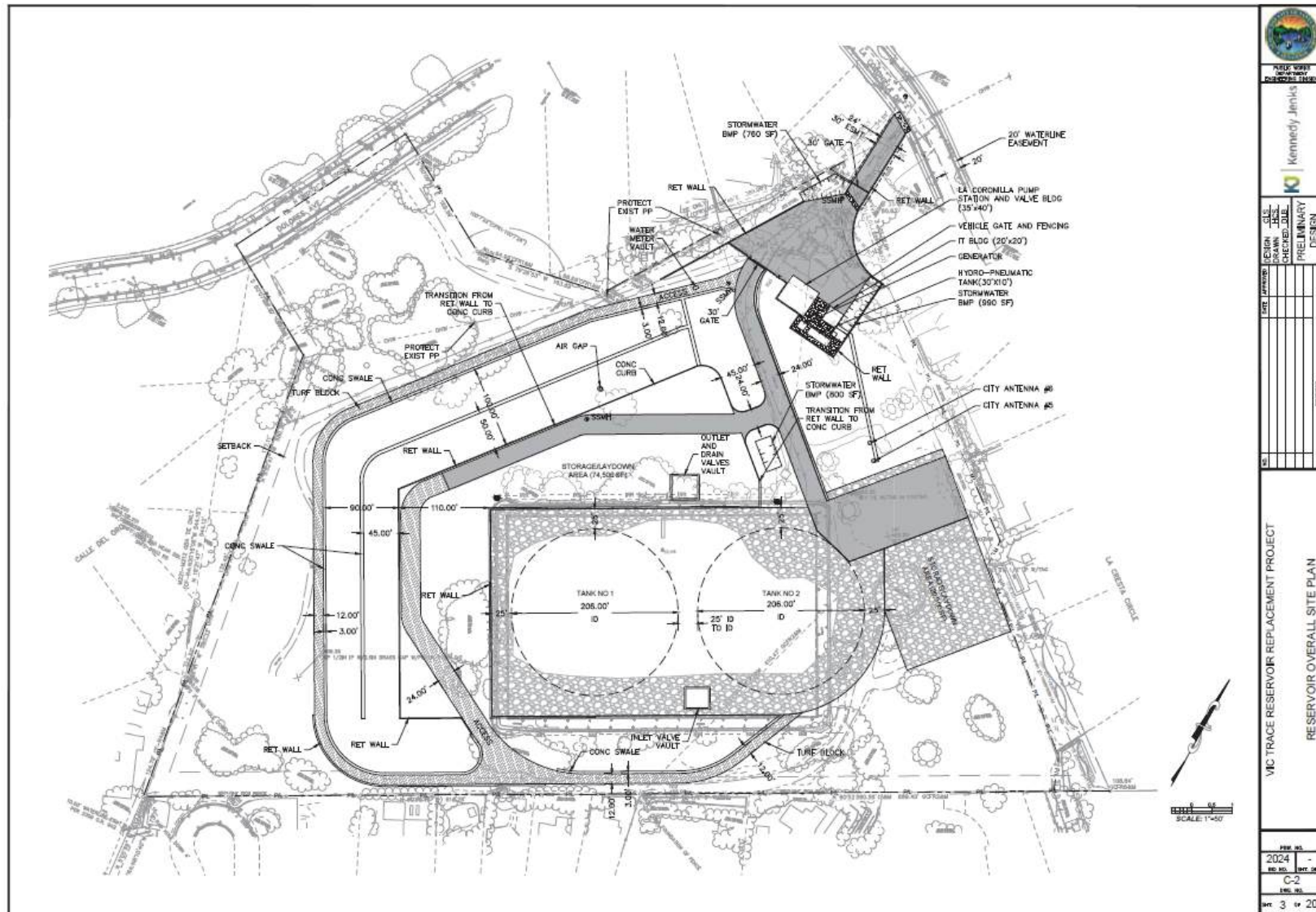
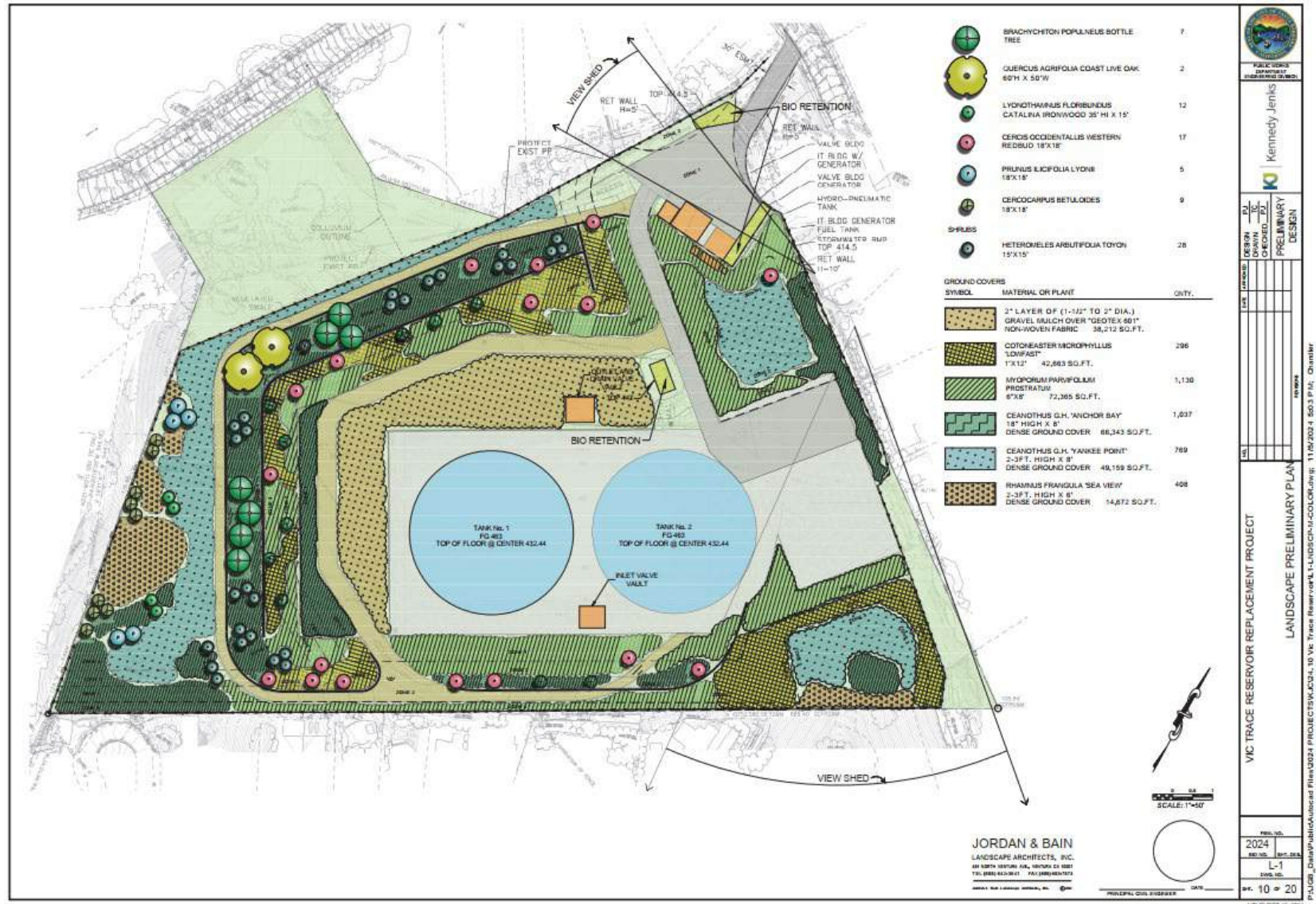


Figure 5 Project Landscape Plan



**Figure 6 Project Visual Renderings (Part 1)**



**Rendering 1.** Aerial rendering of proposed Vic Trace Reservoir parcel, from above.



**Rendering 2.** Aerial rendering of proposed Vic Trace Reservoir site improvements, facing south.



**Rendering 3.** Aerial rendering of proposed Vic Trace Reservoir parcel, facing southeast.



**Rendering 4.** Close-up aerial rendering of proposed Vic Trace Reservoir site improvements, facing southeast.

**Figure 7 Project Visual Renderings (Part 2)**



**Rendering 1.** Rendering view of entrance to Vic Trace Reservoir parcel from La Coronilla Drive, facing south.



**Rendering 2.** Rendering close-up view of gated entrance to Vic Trace Reservoir parcel from La Coronilla Drive, facing south.



**Rendering 3.** Rendering view of proposed Valve Building and IT/Communications Building near site entrance, facing south.



**Rendering 4.** Rendering view of La Coronilla Park after Project implementation, facing east.

## Vic Trace Reservoir Parcel Improvements

### Vic Trace Reservoir Replacement

The proposed Project would demolish the existing 10 MG Vic Trace Reservoir and construct two identical, circular, prestressed concrete 5 MG reservoirs, shifted 30 feet northeast of the current reservoir's centerline and completely buried with 1.5 feet of cover. The installation of two reservoirs, rather than a single 10 MG reservoir, would provide the City with greater operational flexibility by allowing one reservoir to be taken offline for maintenance or seasonal cycling while maintaining uninterrupted service. This approach enhances water quality by reducing water age and improving turnover within the storage system.

Due to the slope of the reservoir area, the northwest- and southwest-facing sides of the reservoir area would be exposed with support from retaining walls, creating a lower terrace. The retaining walls would be approximately five to fifteen feet in height. The site's existing top (highest) ground surface would be lowered from its existing 465 feet above sea level to 463 feet above sea level.

The new reservoirs would each have an inside diameter of 206 feet and a side water depth of approximately 20 feet. The roofs would be column-supported conventionally reinforced flat slab. Following reservoir construction, backfill would be placed against the walls. The tops of both reservoirs would be covered with permeable finished surfaces (e.g., aggregate base or gravel).

Reservoir design and construction is governed by multiple codes and consensus standards, including the latest versions of the California Building Code and International Building Code, California Code of Regulations (Title 17 and 22), and American Water Works Association (AWWA) Standards.

The two new reservoirs would be separated by approximately 20 feet to provide sufficient space for the construction of inlet and outlet pipelines between the two reservoirs. Separate inlet and outlet pipelines would be installed on opposite sides of the reservoirs to minimize short-circuiting and stagnation of the water flow. Inlet, outlet, overflow, and drain pipelines would consist of cement mortar lined and coated welded steel pipes. The inlet and outlet pipelines would be equipped with isolation valves allowing removal of one or both reservoirs from service for repairs and maintenance.

Access to reservoir valves would be through two cast-in-place concrete vault structures, completely buried, except for hatches at the ground surface for personnel access to the staircases and for valve/equipment access. The proposed valve vaults would conform to modern Occupational Health and Safety Administration (OSHA) standards and would provide safer and more ergonomic access for operators in comparison to existing conditions.

- The Inlet Valve Vault would be located southeast and centered between the two reservoirs, and would be approximately 24 feet long, 24 feet wide, and 37 feet 11 inches deep.
- The Outlet Valve Vault would be located northwest and centered between the two reservoirs, and would be approximately 28 feet long, 24 feet wide, and 28 feet deep.

Proposed appurtenances for each vault would include roof vents, interior staircases, two access hatches on the roof (one for personnel entry and one for equipment), and guardrails around each roof hatch. Additional appurtenances may also be proposed for remote reservoir monitoring and water quality equipment.

The proposed Project would also install a replacement 8-inch water pipeline with adequate pressure for reservoir washdown water, fire hydrants, and irrigation. This replacement reservoir overflow and drain pipeline would operate similar to existing conditions, discharging water through the property via a

replaced 30-inch pipeline to an existing storm drain manhole at La Coronilla Park, which connects to an existing to an underground City storm drain system along Dolores Drive.

## Site Access

A new 24-foot-wide asphalt concrete paved access road would be constructed from La Coronilla Drive to the top of the reservoir site to facilitate large vehicles and two-way traffic under normal operations. The improved access road would be located approximately over the existing access road alignment.

As shown in the visual renderings in Figure 7, one 30-foot-wide manual swinging wrought iron gate would be located along this access road, just before the paved area widens for parking, turnaround, and access to the proposed Valve Building and IT/Communications Building. Approximately 160 feet southwest of the newly proposed site entrance gate, a second 30-foot-wide manual swinging wrought iron gate would be located next to the replaced La Coronilla Pump Station and Valve Building, and would limit access to the reservoirs to only City Water Resources Division personnel. From this second gate, a proposed 24-foot-wide paved reservoir access road would provide access to the top of the reservoir site. A smaller, paved area would be provided near the northeastern tank for fire truck access and turn-around. Access roads and turnaround areas would comply with all applicable City of Santa Barbara Fire Department standards.

Approximately halfway up the paved access road, another new paved road would extend to the terraced area. The Project would also construct a new 12-foot-wide site perimeter road, with a finished surface of turf block or similar for the purposes of perimeter site access for landscaping, maintenance, fire and safety personnel, and for driving access for third party utility maintenance (e.g., Southern California Edison).

Construction access is described in *Construction Staging and Traffic*.

## Security

The site entrance vehicle gate would be equipped with controlled access for City staff. The two new gates would have manual locks and Knox boxes for fire access, and would be equipped with security cameras. All new structures would have keyed or card reader exterior door access.

The proposed Project would remove all unauthorized pedestrian gates installed by private property owners within the existing perimeter fencing. The Project would replace or maintain existing fencing and install new fencing to enclose the entire perimeter of the site. New fencing visible from the ROW along Dolores Drive would be Shepherd hook configuration of uniform height, and new fencing not visible from the ROW or other public viewing areas would be either Shepherd hook or chain-link.

## Re-abandoned Oil Well

The Project would re-abandon to current standards the existing abandoned oil well onsite underneath the north-east corner of the Vic Trace Reservoir. Due to the oil well's location under the existing reservoir, its current top of casing elevation is unknown. The Project would locate the existing oil well, and cut and cap the oil well casing to an elevation lower than the new reservoir concrete floor prior to installation of the new reservoir. The Project would also install a new cement plug from the top of the cut casing to approximately 75 ft deep. Re-abandonment procedures would be in coordination and compliance with the State of California's Department of Conservation, Geologic Energy Management Division (CalGEM).

## Replaced Valve Building

The Project would demolish the existing Valve Building near the site entrance driveway. A new 1,000-square foot concrete Valve Building with a metal deck roof would be constructed. The new Valve Building would house the control valves, booster pumps (“La Coronilla Pump Station”), hypochlorite disinfection system, electrical and remote monitoring equipment, and a restroom. Space adjacent to the Valve Building would be allocated for a hydropneumatic tank and standby generator.

The standby generator would consist of a diesel engine-driven generator rated 480V, 3-phase, 60-hertz (Hz), 0.8 power factor, 150 kilowatt (kW). The generator would be installed in a sound-attenuating weatherproof enclosure adjacent to the proposed Valve Building. An aboveground fuel tank would be provided on the same pad as the generator set. The fuel tank would have a double wall and a leak detection device.

All metal vessels used as hydropneumatic tanks must be constructed to American Society of Mechanical Engineers (ASME) standards, including maximum operating pressure and minimum wall thickness.

## Renewable Energy

The Project may involve construction of renewable energy generation and storage equipment to sustainably power the replaced valve building and pumps. If installed, a photovoltaic (PV) solar energy generation system would be 60 kilowatts (kW) and would power the onsite electrical facilities at a minimum. A 60 kW system equates to approximately 4,500 square feet of solar panels that would either be installed on top of the reservoir area and/or on south-west facing hillslopes to maximize solar generation. The solar system would consist of solar panels, wiring and conduits, an inverter, electrical meter and possible battery storage.

## Relocated Communications/IT Building and Antennas

The existing Communications/IT Building would be demolished. A new 400-square foot concrete or concrete masonry IT building with a metal deck roof would be constructed near the site entrance, on the east side of the new Valve Building or would remain near the IT Building’s existing location east of the existing reservoir. The majority of the existing antenna towers would be demolished and some antenna towers and pedestals would be rebuilt, relocated, or modified on-site. The total number of antenna towers would not increase as compared to existing conditions. Tower heights may increase as compared to existing conditions but would not exceed 65 feet, the Santa Barbara Municipal Code (SBMC) height limit for antennas serving emergency communications located in residential areas (SBMC Section 30.185.410.C.1a). The IT building would be equipped with a 50 kW diesel generator, which are designed to store approximately 50 gallons of diesel fuel.

## Terraced Area

Portions of the Vic Trace Reservoir parcel to the northwest and southwest sides of the new reservoirs would be graded to create approximately 7,000 square feet of terraced areas for storage and laydown of materials, staging for repairs and replacement, and ongoing operations and maintenance needs, necessitating the export of approximately 83,000 cubic yards of soil. The terraced area would be covered with pervious materials and an asphalt impervious access road for fire personnel access.

## Landscaping

Figure 5 shows the proposed landscape plan. Existing plants and trees within the development footprint would be removed prior to grading and excavation. Vegetation removal would include up to approximately

55 trees, including approximately seven coast live oaks. All removed trees would be replaced on the Vic Trace parcel.

Following the completion of construction, new drought-tolerant and fire-resistant landscaping would be installed. The proposed plant palette would consist of a mix of California native shrubs, trees, and ornamentals, and would require no irrigation once plants are established, as well as minimal maintenance activities. All proposed plant species would comply with the City of Santa Barbara's Fire Department Fuel Modification requirements (SBMC Section 8.04), as well as the State of California's Model Water Efficient Landscape Ordinance. Landscaping would comply with Santa Barbara's Water Efficient Landscape Standards (SBMC Section 14.23.005).

## **Stormwater**

The Project would install stormwater best management practices (BMPs) on the Vic Trace Reservoir parcel. Much of the parcel would remain pervious, and stormwater flows are expected to infiltrate or match existing surface flow patterns. Grading and drainage would be configured to encourage slowing and infiltrating stormwater on-site. Storm drain piping would be installed on-site to convey water to stormwater BMPs and storage areas.

The site perimeter road would be sloped back into the hillside, directing water to a vegetated swale. On the southern portion of the parcel, stormwater flows would be directed to a stormwater storage area situated on the western portion of the parcel. Excess flows would enter the storm drain system offsite. The Project would comply with the City's Storm Water BMP Technical Guidance Manual adopted in 2020 and would comply with Tier 4 requirements.

## **Lighting**

Lighting on the Vic Trace Reservoir site would be similar to existing conditions. Lighting would be located at the new buildings and would comply with the City's Outdoor Lighting Ordinance ([SBMC] Chapter 22.75) and Outdoor Lighting Design Guidelines. Consistent with existing conditions, lighting would only be turned on for safety during occasional nighttime maintenance and repair work.

## **La Coronilla Park**

The only improvements proposed at La Coronilla Park are minor upgrades to the existing reservoir pipeline infrastructure. All improvements would be underground, and disturbed areas would be restored to pre-Project conditions following construction. Temporary construction access (e.g., an eight-foot-wide graded temporary road) may be provided through the park. Upon completion of construction activities at La Coronilla Park, disturbed areas would be restored to pre-Project conditions. It is anticipated public access to a section of La Coronilla Park would be unavailable for approximately six months during Project construction.

## **Offsite Improvements**

### **Relocated La Coronilla Transmission Main**

The proposed Project would abandon in-place a portion of the existing 24-inch water transmission main that conveys finished drinking water from the City's Cater Water Treatment Plant to the Vic Trace Reservoir, located within a City utility easement in the backyards of single-family residences that front La Coronilla Drive. Minor aboveground appurtenances (e.g., valve cans) would remain in place. The existing pipeline would be cut and capped in place from the public ROW. No ground disturbing activities would occur associated with the abandonment, and no work would be required outside of the public ROW.

The Project would also install a new, relocated 24-inch water transmission main within La Coronilla Drive ROW, between Meigs Road and the proposed Valve Building at the Vic Trace Reservoir site, likely within the same trench as a previously abandoned 8-inch distribution main. The Project would remove the previously abandoned water main during construction. Unless provided a waiver is provided from the California Division of Drinking Water, separation requirements between water and sewer mains, approximately 150 linear feet of the 24-inch water transmission main along La Coronilla Drive would be installed under existing concrete driveways and sidewalks within the public ROW to meet water and sewer pipeline separation requirements. Portions of existing concrete sidewalks and driveways aprons within the right of way disturbed by the Project would be replaced to match existing grades as required by the new alignment.

### **Replaced Vic Trace Outlet Main**

The Project would install a new reservoir outlet main, consisting of a 12- or 16-inch pipeline that would exit the Vic Trace Reservoir towards the parcel's entrance on La Coronilla Drive, head north along La Coronilla Drive and then turn south along Dolores Drive to the new PRV station located at the intersection of Meigs Road and Dolores Drive. At the PRV, the pipeline would turn south along Meigs Road and reconnect to an existing water main at the intersection of Meigs Road and Red Rose Way. The new reservoir outlet main would convey water from the Vic Trace Reservoir to the new PRV station, where water pressure would be reduced. Construction activities would occur within the Vic Trace Reservoir parcel, Dolores Drive, and Meigs Road and La Coronilla Drive ROWs.

### **Replaced Dolores Drive Main**

The Project would abandon in place or remove the existing, aging, cast iron 8-inch water main within Dolores Drive and replace it with a new water main of the same size and capacity. Replacement of the water main would minimize future possible service disruptions and emergency shutdowns from water infrastructure failure. Construction would include the reconnection of existing service lines from the existing main to the new main, and all construction activities would occur within the Dolores Drive ROW.

### **New Ricardo Avenue Main**

The Project would also install a new water main along Ricardo Avenue. It would connect to the proposed discharge main at the intersection of Ricardo Avenue and Dolores Drive and traverse along Ricardo Avenue to La Vista Del Oceano Drive. Construction activities would occur within the Ricardo Avenue ROW.

### **Entry/Exit Pits for La Vista Del Oceano Pipeline Lining**

An existing underground Vic Trace Reservoir Outlet Main runs south from the Vic Trace Reservoir site to the existing PRV on La Vista Del Oceano Drive. The northern portion of the pipeline, running from the Vic Trace Reservoir site to Ricardo Avenue, would be abandoned in place. No ground disturbance would be required. The southern portion of the pipeline, which extends from Ricardo Avenue to the existing PRV on La Vista Del Oceano Drive, would be rehabilitated through trenchless relining. Two lining pits would be temporarily excavated within the public ROWs on Ricardo Avenue and La Vista Del Oceano Drive. No ground disturbance is proposed outside the public ROWs. Relining construction activities are detailed in *Pipeline Abandonment, Rehabilitation, and Construction*.

### Existing PRV (to be abandoned)

PRV stations convey and regulate water between zones of different water pressure across the City. The existing La Vista Del Oceano PRV station provides a critical flow path between pressure zones. The existing PRV station does not meet current OSHA personnel safety standards. The proposed Project would abandon the existing La Vista Del Oceano PRV station located within the paved ROW north of Cliff Drive at La Vista Del Oceano.

### Proposed PRV Station (to be constructed)

The Project would construct a new PRV underground within the Dolores Drive ROW, on the southern sidewalk approximately 80 feet east of the intersection of Meigs Road and Dolores Drive, east of an existing stormwater drop inlet facility. The approximate dimensions of the PRV station would be 16 feet by 8 feet with an approximate ground disturbance area of 18 feet by 10 feet. This PRV would replace the existing La Vista Del Oceano PRV to be abandoned and described above. A temporary construction easement may be required to construct the PRV, as equipment may require adjacent staging space on private property to the south (APN 035-142-011).

## Project Construction

### Construction Schedule

Construction activities would generally occur from 7:00 A.M. to 5:00 P.M., Monday through Friday. While the majority of construction would occur during daytime hours and weekdays, occasional nighttime or weekend activities may be required to minimize water outages.

Construction of the proposed Project is expected to occur over approximately three years, anticipated to begin in July 2028 and end in August 2031. Table 2 provides the estimated construction durations. Project activities may occur concurrently.

**Table 2 Project Construction Schedule**

| Activity                                               | Approximate Duration |
|--------------------------------------------------------|----------------------|
| Vic Trace Reservoir Shutdown, Drainage, and Demolition | 4 months             |
| Oil Well Re-abandonment                                | 6 months             |
| New Reservoir Construction                             | 16.5 months          |
| Vic Trace Reservoir Site Improvements                  | 19.5 months          |
| On and offsite Pipeline Construction                   | 24 months            |
| PRV Station Relocation                                 | 6 months             |

### Vic Trace Reservoir Parcel Construction Activities

The Project would shut down, drain, and demolish the existing Vic Trace Reservoir. Project demolition would include the entire existing Vic Trace Reservoir, appurtenant piping, pavement, and reservoir fencing; the existing Valve Building, IT/Communications Building, hydro-pneumatic tank, disinfection facilities, generator, and aboveground fuel tank; asphalt pavement and curb and gutter along La Coronilla Drive at the site entrance; the existing entrance access road from the Valve Building to the reservoir pad; all existing on-site utilities; and most existing on-site vegetation.

Table 3 identifies anticipated Project demolition debris quantities associated with demolition of the existing Vic Trace Reservoir. Haul routes and disposal are discussed in *Construction Staging and Traffic*.

**Table 3 Anticipated Project Demolition Debris Quantities**

| Material | Volume (cubic yards) | Weight (tons) |
|----------|----------------------|---------------|
| Concrete | 2,010                | 4,223         |
| Steel    | 29                   | 194           |

Project construction activities would include grading the site, re-abandoning the oil well, constructing two 5 MG reservoirs, constructing retaining walls to create terraced areas, and constructing the Valve and Communications/IT Buildings. The terraced areas would be used for staging and laydown during construction, and for other water operations and maintenance uses during the reservoir's ongoing operation. Approximately 13,840 cubic yards of concrete would be required for the retaining walls.

The major elements of construction for prestressed concrete reservoir tanks include the tank floor, footings and columns, wall sections, and the roof. Approximately 6,450 cubic yards of concrete would be required for reservoir construction.

### Temporary Water Storage

Temporary water storage at the Vic Trace Reservoir during construction activities would likely not be required, as the City will have sufficient offsite storage elsewhere in the water system by the start of the Project to accommodate the construction duration. This was preliminarily confirmed by hydraulic analysis performed for the City's Water Distribution Infrastructure Plan in 2019 and will continued to be studied.

## Pipeline Abandonment, Rehabilitation, and Construction

### La Coronilla Transmission Main Abandonment

The existing La Coronilla Transmission Main to be abandoned would be cut and capped with a welded on blind flange or plate. No ground disturbing activities would be required for the abandonment. Minor aboveground appurtenances (e.g., valve cans) would remain in place.

### Existing Vic Trace Outlet Main Abandonment and Rehabilitation

The existing Vic Trace Outlet Main would be partially abandoned and partially rehabilitated as part of the La Vista Del Oceano Pipeline Lining portion of the Project. The following sections outline the abandonment and rehabilitation activities:

- **Northern Segment Abandonment (Existing Vic Trace Outlet Main):** The northern segment would be abandoned in place. No ground disturbance would be required for this portion, and the pipeline would be cut and capped at its terminus near Ricardo Avenue.
- **Southern Section Rehabilitation (La Vista Del Oceano Pipeline Lining – Entry and Exit Pits):** The southern segment would be rehabilitated using trenchless relining methods. Construction would begin with the excavation of an approximately 6-foot by 10-foot by 6-foot-deep entry pit within the Ricardo Avenue ROW to expose the existing pipeline. A corresponding exit pit, approximately 6 feet by 10 feet by 8 feet deep, would be excavated near 1532 La Vista Del Oceano on the western side of the roadway, either within the ROW or an existing utility easement. From the entry pit, a liner would be installed heading south through the existing pipeline alignment towards the exit pit. Upon completion of the relining process, custom fittings would be installed within the trench, followed by backfilling and repaving of the disturbed roadway surface. Final restoration would include installation of fittings, backfilling, repaving, and/or replanting, as appropriate.

## **New, Replaced, and Relocated Pipelines**

The Relocated La Coronilla Transmission Main, New Vic Trace Outlet Main, Replaced Dolores Drive Main, and New Ricardo Avenue Main would be constructed using open-cut trench methods. Open-cut trench pipeline installation typically consists of trench excavation (including saw cutting of pavement where applicable), removal of pipeline, pipe bedding stabilization, pipe installation, and backfill. The construction crew would typically operate a backhoe and/or excavator, compaction equipment (attachment on an excavator and hand-operated equipment), dump trucks for stockpiling of soils and delivery of backfill material, utility trucks (with truck-mounted or towed generator and hand tools), and water trucks/water buffalos.

Pipeline construction would progress in a linear manner along each alignment, with an estimated average installation rate of approximately 75 feet per day. Generally, trench spoils would be temporarily stockpiled within the working area adjacent to the pipeline trench or on the Vic Trace Reservoir parcel.

## **PRV Station Abandonment and Construction**

PRV station abandonment activities would be limited to valve replacement within the existing PRV; no excavation would be required, as the valve can be replaced using existing manhole entrances and mechanical tools.

Construction of the new, relocated PRV station at Dolores Drive and Meigs Road would involve excavation, installation of the vault and equipment, and backfilling. First, a hole would be excavated (18 feet long by 10 feet wide by 8 feet deep) to accommodate the new vault (16 feet by 8 feet) with the top of the vault and hatches at grade. Some of the excavated area may be on private property (approximately 2 feet by 18 feet). The utility vault would either be cast in place or pre-cast. If pre-cast, the vault would be installed with a small crane. The vault would contain water appurtenances such as pipelines, valves, a sump pump, and remote water monitoring equipment, and would be connected to electrical power.

Aboveground features at the new PRV station are expected to include a programmable logic controller (PLC) panel, a separate Southern California Edison (SCE) electrical service enclosure, and a low-profile antenna for Supervisory Control and Data Acquisition (SCADA) communications. These components would be installed adjacent to the underground vault, with all electrical connections routed underground to a nearby overhead power pole at the intersection of Dolores Drive and Meigs Road. Additional visible elements may include at-grade access hatches and small vent pipes, consistent with other PRV installations throughout the City. Additional underground pipelines would be constructed to connect the PRV station to existing pipelines within the ROW.

## **Construction Staging and Traffic**

### **Staging and Laydown**

Construction staging and laydown would occur on the Vic Trace Reservoir parcel. Equipment and office trailers may be staged near the existing Valve Building. Some construction staging and laydown may occur within the public right-of-way along La Coronilla Drive, Dolores Drive, Ricardo Avenue, and La Vista Del Oceano.

### **Construction Traffic**

Consistent with City Transportation Division requirements, construction-related truck trips would be scheduled during working hours (7:00 a.m. to 5:00 p.m.). While the majority of construction would occur during daytime hours and weekdays, occasional nighttime or weekend construction traffic may be

required to minimize water outages or for construction activities that necessitate continuous work (e.g., concrete pouring).

Across the anticipated five-week demolition phase, approximately 224 two-way truck trips are estimated for removal of concrete and steel, or approximately eight to 10 per day.

Across the anticipated four-month excavation and site grading phase, approximately 9,230 two-way truck trips are estimated for removal of soil, or approximately 100 to 110 per day.

Across the Project construction period, approximately 1,440 two-way truck trips are estimated for delivery of concrete. Assuming this is spread over 100 working days, this yields approximately 14 per day.

At least 11,700 worker trips are anticipated throughout the entire construction period (approximately three years). Assuming at least 780 working days in total, this yields approximately 15 worker trips per day.

Demolition and other debris that cannot be recycled through other means would likely be hauled to the South Coast Recycling & Transfer Station (4430 Calle Real, Goleta), which would direct trash to the Tajiguas Landfill (14470 Calle Real, Goleta). The haul route would likely proceed northwest from the Project site along La Coronilla Drive, with a right turn on West Carrillo Street and northeast towards US-101 North.

Construction traffic, including haul trucks and construction worker vehicles, would access the Project site via two potential routes: La Coronilla Drive, via West Carrillo Street/Meigs Road to United States Highway 101; or Dolores Drive, via Meigs Road and Cliff Drive to United States Highway 101.

All staging and personnel parking would occur on-site at the Vic Trace Reservoir parcel.

## **Traffic Controls**

Signage and flagger controls would be implemented within various roadways across the Project site. Traffic control at the intersection of Meigs Road and Cliff Drive would include signs advising drivers of trucks entering and exiting Dolores Drive.

The City would engage in community outreach to notify the neighborhood of anticipated road closures and construction activities. Notifications may include, but are not limited to, social media posts, mailers, and/or emails to interested parties and neighbors. The City would also coordinate directly with adjacent property owners to notify them of daily roadway access and parking restrictions.

## **Operation and Maintenance**

Upon completion of construction activities, regular operation, maintenance, and IT activities at the Vic Trace Reservoir parcel would resume and would be similar to existing conditions. Compared to existing conditions, electricity consumption would increase by approximately 70,000 kWh per year to power the replaced La Coronilla Pump Station and new security systems not currently in place.

In the event any Project component is compromised during operation, the City would conduct emergency repairs as soon as possible; emergency response and repairs are part of the City's normal operations to maintain system integrity and reliability and are not a new or increased activity associated with the Project.

## Summary of Potentially Required Approvals

Table 4 lists the anticipated permits and discretionary approvals that may be required for Project-related activities. One of the purposes of the Initial Study is to provide these agencies with information to support the agency permitting process. Table 4 also lists the types of activities that would be subject to these requirements.

**Table 4 Summary of Potentially Required Permits/Approvals**

| Regulating Entity                                                                     | Potential Permit/Approval                                                                      | Reason for Permit/Approval                                                                                |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Central Coast Regional Water Quality Control Board                                    | National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit | Construction activities resulting in ground disturbance exceeding one acre                                |
| City of Santa Barbara                                                                 | Encroachment Permit                                                                            | Pipeline construction within City rights-of-way                                                           |
|                                                                                       | Tree Removal Permit                                                                            | Removal of trees                                                                                          |
|                                                                                       | Conditional Use Approval                                                                       | City project requiring discretionary review                                                               |
|                                                                                       | Building Permit                                                                                | Compliance with building and safety codes                                                                 |
|                                                                                       | Grading Permit                                                                                 | Site grading                                                                                              |
|                                                                                       | Design Review                                                                                  | Review design for compatibility                                                                           |
|                                                                                       | Discharge Permit                                                                               | Possible construction dewatering                                                                          |
| Santa Barbara County Air Pollution Control District                                   | Authority to Construct (ATC)/Permit to Operate (PTO)                                           | Generator installation                                                                                    |
| Santa Barbara County Public Health Department, Environmental Health Services Division | Soil Management Plan approval                                                                  | Possible excavation of oil contaminated soils from existing abandoned oil well                            |
|                                                                                       | Aboveground Fuel Storage approval                                                              | Construction of aboveground fuel tanks.                                                                   |
| Division of Drinking Water Santa Barbara District                                     | Water Supply Permit amendment                                                                  | Changes to a water supply source, storage, treatment, or for the operation of new water system components |
| California Department of Conservation, Geologic Energy Management Division            | Oil Well Re-abandonment Permit                                                                 | Construction activities resulting in the re-abandonment of existing abandoned oil well                    |
| Southern California Edison                                                            | Project Permit<br>Temporary Power Service                                                      | Consolidation, modification, and relocation of electrical services, temporary service during construction |
| Frontier Communications                                                               | Project Permit                                                                                 | Modification and relocation of cable communication service                                                |

## PROPERTY CHARACTERISTICS

| Site Information                 |                                          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------|------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Assessor's Parcel Number:</i> | 035-033-031                              | <i>Lot Area:</i> | Approximately 15 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>General Plan Designation:</i> | Institutional; Parks & Open Space        | <i>Zoning:</i>   | RS-15; PR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <i>Existing Use:</i>             | Water infrastructure & Neighborhood Park | <i>Slope:</i>    | The Vic Trace parcel contains a sloped hillside. The hillside slopes range from approximately 15 percent to 40 percent. The slope face around the reservoir flattens out briefly for a narrow dirt/grass site perimeter road. Slope faces between the site perimeter road and the reservoir perimeter road are 150 to 300 feet wide and have an elevation difference of 50 to 60 feet. There are no visible terraces or benches on the slopes. The slopes on top of the hill around the reservoir, antennae, and structures range between 1 percent and 5 percent. |
| Surrounding Land Uses & Zoning   |                                          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>Existing Uses</i>             |                                          | <i>Zoning</i>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>North:</i>                    | Residential                              | RS-15            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>South:</i>                    | Residential; Commercial                  | RS-15; C-R       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>East:</i>                     | Residential                              | RS-15            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <i>West:</i>                     | Residential                              | RS-15; R-2       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## ENVIRONMENTAL SETTING

### Existing Site Land Uses and Characteristics

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#### Vic Trace Reservoir Parcel

The Vic Trace Reservoir parcel (site) covers approximately 15 acres and contains Lavigia Hill. The peak of Lavigia Hill sits approximately 460 feet above sea level, 50 feet higher than the site entrance at La Coronilla Drive.

The parcel hosts existing City-owned infrastructure facilities, including:

- **Vic Trace Reservoir:** Vic Trace Reservoir is a partially buried drinking water storage reservoir with a storage capacity of 10 (MG). Located in the center of the parcel at the top of Lavigia Hill, the reservoir was constructed in 1956 of rectangular concrete and measures 248 feet in width, 380 feet in length, and with a side water depth of 20 feet. The concrete-lined reservoir sits primarily below ground, surrounded by a raised concrete foundation. Above ground, the reservoir is covered by a low-pitched side gabled roof sheathed in corrugated metal siding on a low concrete wall. The existing reservoir extends approximately 4 feet above ground level and is not visible from adjacent public roads.
- **Valve Building:** The Valve Building is located at the northern entrance to the Vic Trace Reservoir parcel, adjacent to the driveway/easement from La Coronilla Drive. The structure was built in 1956 and is 25 feet long, 20 feet wide, and 14 feet tall. It is constructed of poured concrete and capped by a flat roof. The Valve Building contains control valves for the reservoir, the La Coronilla Pump Station, post-water disinfection (chlorine) storage and feed equipment, and an adjacent metering vault and hydropneumatic tank.
- **Telecommunications Facilities:** City radio equipment and a communication facility are situated on the parcel, which is also leased by AT&T and Santa Barbara Wireless Foundation (previously known as the Santa Barbara Amateur Radio Club), both vacating the site by 2026. A City-owned Information Technology (IT) Building 30 feet long by 27 feet wide houses a generator, with a connected 250-gallon diesel fuel tank outside of the building. A second mobile structure is owned by the Santa Barbara Wireless Foundation and will be removed prior to the Project.
- **Abandoned Oil Well:** An existing, previously abandoned oil well (drilled and abandoned in 1935) is located in the vicinity of the north-east corner of the existing Vic Trace Reservoir. The oil well was drilled to a depth of 1,555 feet. The oil well did not produce any oil and was abandoned per State of California Division of Oil and Gas abandonment procedures in the same year.

One ingress and egress driveway provides site access to the Vic Trace Reservoir parcel. A one-lane, 20-foot wide paved road runs from La Coronilla Drive southward up Lavigia Hill to the existing reservoir and telecommunication facilities. An unpaved approximately 8-foot wide access road continues intermittently around the perimeter of the reservoir. A combination of chain link and shepherds hook fencing (5-8 ft tall) surround the perimeter of the property (with the exception of La Coronilla Park). A second internal chain link fence (7 ft tall) encloses the reservoir roof area. A locked, chain link security gate is located at the property entrance.

The western portion of the Vic Trace Reservoir parcel also contains La Coronilla Park, an undeveloped, vegetated neighborhood park situated between 726 and 812 Dolores Drive.

Other than the developments described above, the remainder of the Vic Trace Reservoir parcel is generally undeveloped with vegetation communities such as grassland, coast live oak woodland,

eucalyptus grove, sagebrush, and ice plant mats. The parcel is regularly mowed and vegetation is maintained for fire suppression. Unauthorized pedestrian gates have been installed by private property owners along the perimeter fencing. Figure 8 shows site photographs of existing conditions at the Vic Trace Reservoir parcel and offsite infrastructure improvement areas.

## Offsite Improvements

Offsite of the Vic Trace Reservoir parcel, the existing pipelines and the existing La Vista Del Oceano Pressure Reducing Valve (PRV) station are located underground in paved roadways in the Alta Mesa residential neighborhood surrounding the Vic Trace Reservoir site. PRV stations convey and regulate water between zones of different water pressure across the City. The proposed PRV station relocation site is located on undeveloped land in public right-of-way (ROW), in between a paved curb, sidewalk and a fenced private property.

Figure 8 through Figure 11 show site photographs of existing conditions at the Vic Trace Reservoir parcel and offsite infrastructure improvement areas.

## Current Land Use Designation and Zoning

The portion of the Vic Trace Reservoir parcel containing water infrastructure facilities has a General Plan land use designation of Institutional and is zoned as residential single unit with a 15,000 square foot minimum lot size (RS-15). The portion of the Vic Trace Reservoir parcel containing La Coronilla Park has a General Plan land use designation of Parks and Open Space and is zoned as a Park and Recreation (P-R). According to the City of Santa Barbara's General Plan Open Space, Parks and Recreation Element, La Coronilla Park is designated as a "Neighborhood Park."

The Offsite Improvement areas are located within paved roadways and public ROW within the surrounding residential neighborhood generally designated as Low Density Residential, with a zoning designation of RS-15 (Residential Single Unit, 15,000 square foot minimum lot size) and RS-7.5 (Residential Single Unit, 7,500 square foot minimum lot size).

Land uses for the Project site and surrounding area are shown in Figure 12. Zoning is shown in Figure 13. As shown, the Project site is not located in the Coastal Zone.

**Figure 8 Site Photographs – Vic Trace Reservoir Parcel and La Coronilla Park**



**Photograph 1.** Drone aerial view of existing Vic Trace Reservoir, facing southeast.



**Photograph 2.** Pedestrian view of existing trees, communications equipment and Vic Trace Reservoir roof, facing south.



**Photograph 3.** Pedestrian view of southern portion of Vic Trace Reservoir Parcel, facing south.



**Photograph 4.** Pedestrian view of La Coronilla Park, facing southeast.

**Figure 9** Site Photographs – Offsite Improvement Areas - Underground Mains



**Photograph 5.** Pedestrian view of intersection of La Coronilla Drive and Meigs Road, facing west (*Relocated La Coronilla Transmission Main*).



**Photograph 6.** Pedestrian view of La Coronilla Drive, facing northwest (*Relocated La Coronilla Transmission Main*).



**Photograph 7.** Pedestrian view intersection of La Coronilla Drive and Dolores Drive, facing northeast (*Replaced Vic Trace Discharge Outlet Main and Replaced Dolores Drive Main Replacement*).



**Photograph 8.** Pedestrian view from the intersection of Dolores Drive, facing east (*Replaced Vic Trace Outlet Main and Replaced Dolores Drive Main Vic Trace Discharge Main/Dolores Drive Main Replacement*).

**Figure 10 Site Photographs – Offsite Improvement Areas - Underground Mains**



**Photograph 9.** Pedestrian view of lining entry pit area on Ricardo Avenue, facing south (*Entry Pit for La Vista Del Oceano Pipeline Lining*).



**Photograph 10.** Pedestrian view of proposed relining exit pit area on La Vista Del Oceano, facing south (*Exit Pit for La Vista Del Oceano Pipeline Lining*).



**Photo 10.** Pedestrian view of Ricardo Avenue at Dolores Drive, facing southeast (*New Ricardo Main*).



**Photo 11.** Pedestrian view of Ricardo Avenue facing northeast towards Dolores Drive (*New Ricardo Main*).

**Figure 11 Site Photographs – Offsite Improvement Areas - PRV Locations**

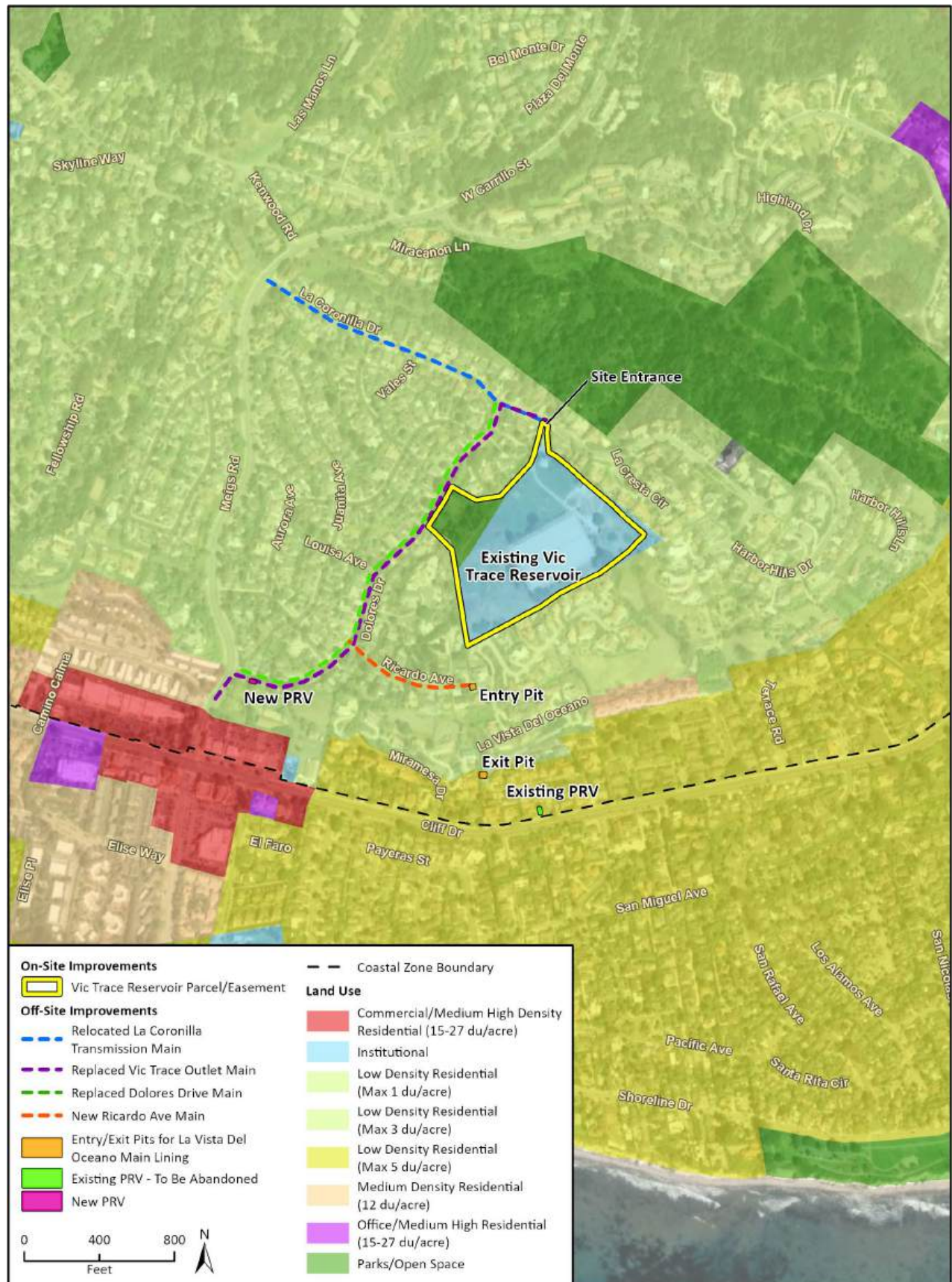


**Photo 12.** Pedestrian view of the PRV station under La Vista Del Oceano, facing south towards Cliff Drive (*Existing PRV to be abandoned*).

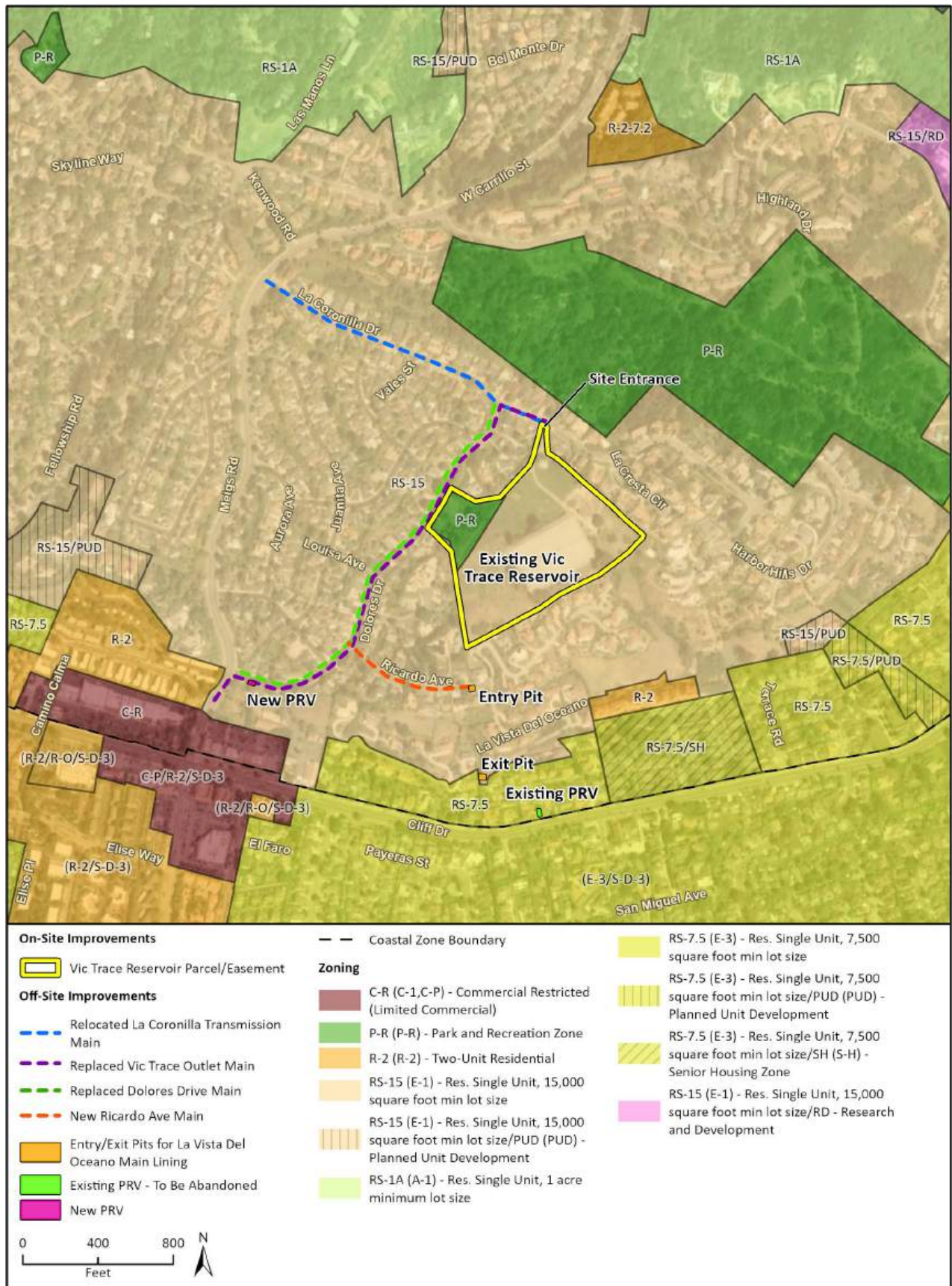


**Photo 13.** Pedestrian view of proposed PRV station location on Dolores Drive, facing southwest (*Proposed PRV Station*).

**Figure 12 Land Use Map**



### Figure 13 Zoning Map



## Neighboring Land Uses and Characteristics

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The Project site is situated in the Alta Mesa residential neighborhood, which consists of single-family residences, a church, and streets. Residential land uses surround the Vic Trace Reservoir parcel to the north, south, east, and west. Commercial land uses straddle the portion of pipeline alignment traversing Meigs Road. Surrounding land uses are labeled in Figure 2.

## Standard Conditions of Approval

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The proposed Project would include the following standard conditions of approval.

### Air Quality-Related

**AQ-1 Construction Phase Dust and Diesel Exhaust Control.** The following measures shall be shown on grading and building plans and shall be adhered to throughout grading, hauling, and construction activities:

- a. During construction, use water trucks, sprinkler systems, or dust suppressants in all areas of vehicle movement to prevent dust from leaving the site. When using water, this includes wetting down areas as needed but at least once in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever possible. However, reclaimed water should not be used in or around crops for human consumption.
- b. On site vehicle speeds shall be no greater than 15 miles per hour when traveling on unpaved surfaces.
- c. Install and operate a track-out prevention device where vehicles enter and exit unpaved roads onto paved streets. The track-out prevention device can include any device or combination of devices that are effective at preventing track out of dirt such as gravel pads, pipe-grid track-out control devices, rumble strips, or wheel-washing systems.
- d. If importation, exportation and stockpiling of fill material is involved, soil stockpiled for more than one day shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin. The amount of excavated material or waste materials stored at the site should be minimized.
- e. Minimize amount of disturbed area. After clearing, grading, earthmoving, or excavation is completed, or if previously graded areas remain inactive for more than 10 calendar days, treat the disturbed area by watering, OR using roll-compaction, OR revegetating or hydroseeding, OR by applying non-toxic soil binders until the area is paved or otherwise developed so that dust generation will not occur. All roadways, driveways, sidewalks etc. proposed to be paved should be completed as soon as possible.
- f. Schedule clearing, grading, earthmoving, and excavation activities during periods of low wind speed to the extent feasible. During periods of high winds (>25 mph) clearing, grading, earthmoving, and excavation operations shall be minimized to prevent fugitive dust created by onsite operations from becoming a nuisance or hazard.
- g. The contractor or builder shall designate a person or persons to monitor and document the dust control program requirements to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures, as necessary, to prevent transport of dust offsite. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons

shall be provided to the Air Pollution Control District prior to land use clearance for map recordation and land use clearance for finish grading of the structure.

- h. All portable diesel-powered construction equipment greater than 50 brake horsepower (bhp) shall be registered with the state's portable equipment registration program (PERP) OR shall obtain a Santa Barbara County Air Pollution Control District (APCD) permit.
- i. Fleet owners of diesel-fueled mobile construction equipment greater than 25 bhp are subject to the California Air Resource Board (CARB) In-Use Off-Road Diesel-Fueled Fleets Regulation (<https://ww2.arb.ca.gov/our-work/programs/use-road-diesel-fueled-fleets-regulation>).
- j. Fleet owners of on-road diesel-fueled heavy-duty trucks and buses are subject to CARB's Heavy-Duty (Tractor-Trailer) Greenhouse Gas Regulation, Periodic Smoke Inspection Program (PSIP), the Statewide Truck and Bus Regulation, and the Advanced Clean Fleets Regulation to reduce emissions from trucks and buses. For more information, see <https://ww2.arb.ca.gov/our-work/programs/truckstop-resources/truckstop>.
- k. Drivers of diesel-fueled commercial motor vehicles are subject to the Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling. Idling restrictions for off-road equipment are set forth in CARB's In-Use Off-road Diesel-Fueled Fleets Regulation. For more information, see <https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling/about>.
- l. At a minimum, off-road diesel equipment should be equipped with engines compliant with, or certified to meet or exceed, CARB Tier 4 emission standards. Where available, off-road construction equipment should be zero-emission. Alternative/renewable fuels such as compressed natural gas (CNG), liquefied natural gas (LNG), or propane should be utilized to the maximum extent feasible when zero-emission is not available. Electric auxiliary power units should be used. The Lead Agency should require commitments to Tier 4 and/or zero-emission equipment in applicable bid documents, purchase orders, and contracts; successful contractors should demonstrate the ability to supply the compliant construction equipment for use prior to any ground-disturbing and construction activities.
- m. On-road heavy-duty equipment with model year 2014 or newer engines or powered by zero- or near zero-emission technology, should be used whenever feasible.
- n. All portable generators should be powered by a source other than diesel or gasoline (i.e., battery, natural gas, propane, etc.).
- o. All construction equipment shall be maintained in tune per the manufacturer's specifications.
- p. The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time. Construction worker trips should be minimized by requiring carpooling and by providing for lunch onsite.
- q. Proposed truck routes should minimize impacts to residential communities and sensitive receptors.
- r. Construction staging areas should be located away from sensitive receptors such that exhaust and other construction emissions do not enter the fresh air intakes to buildings, air conditioners, and windows. Construction activity schedules and hours should be planned and adjusted as feasible to maximize distance from existing sensitive receptors and minimize exposure to air pollution.

**AQ-2 Asbestos & Lead-Containing Materials.** Pursuant to APCD Rule 1001, the applicant is required to complete and submit an Asbestos Demolition / Renovation Notification form for each regulated structure to be demolished or renovated. The completed notification shall be provided to the Santa Barbara County APCD with a minimum of 10 working days advance notice prior to disturbing asbestos in a renovation or starting work on a demolition. Any abatement or removal of asbestos and lead-containing materials must be performed in accordance with applicable federal, State, and local regulations. Permits shall be obtained from the Air Pollution Control District prior to commencement of demolition of the structures containing asbestos and/or lead. Disposal of material containing asbestos and/or lead shall be in sent to appropriate landfills that are certified to accept this material.

### **Biological Resource-Related**

*[Standard Conditions of Approval related to Biological Resources will be addressed in the EIR, where they may be replaced or supplemented with project-specific mitigation measures, as appropriate.]*

### **Cultural Resource-Related**

*[Standard Conditions of Approval related to Biological Resources will be addressed in the EIR, where they may be replaced or supplemented with project-specific mitigation measures, as appropriate.]*

### **High Fire Hazard Area-Related**

**HAZ-1. High Fire Hazard Area Safe Landscaping.** The project landscape plan shall meet the High Fire Hazard Area Defensible Space Requirements outlined in the Community Wildfire Protection Plan (CWPP). All landscape plant species must be fire resistant as described in the CWPP High Fire Hazard Area Landscape Requirements. These plans shall be reviewed and approved by the Fire Department in addition to any required design approvals.

### **Construction Noise-Related**

**N-1.** Neighborhood Notification Prior to Construction. At least twenty (20) days prior to commencement of construction, the contractor shall provide written notice to all property owners, businesses, and residents within 300 feet of the project area. The notice shall contain a description of the project, the construction schedule, including days and hours of construction, the name and phone number of the (Project Environmental Coordinator and) Contractor(s), site rules and Conditions of Approval pertaining to construction activities, and any additional information that will assist the Building Inspectors, Police Officers and the public in addressing problems that may arise during construction.

**N-2. Construction Hours.** Construction (including preparation for construction work) shall only be permitted Monday through Friday between the hours of 7:00 a.m. and 5:00 p.m., and Saturdays between the hours of 9:00 a.m. and 4:00 p.m., excluding the following holidays: New Year's Day (January 1st); Martin Luther King Jr Day (3<sup>rd</sup> Monday in January); President's Day (3<sup>rd</sup> Monday in February); Memorial Day (Last Monday in May); Independence Day (July 4th); Labor Day (1st Monday in September); Thanksgiving Day (4th Thursday in November); Day Following Thanksgiving Day (Friday following Thanksgiving); Christmas Day (December 25th). \*When a holiday falls on a Saturday or Sunday, the preceding Friday or following Monday respectively shall be observed as a legal holiday.

When, based on required construction type or other appropriate reasons, it is necessary to do work outside the allowed construction hours, contractor shall contact the City to request a waiver from the above construction hours, using the procedure outlined in ([SBMC] Section 9.16.040) Construction Work at Night. Contractor shall notify all residents within 300 feet of the parcel of intent to carry out said construction a minimum of 48 hours prior to said construction. Said notification shall include what the work includes, the reason for the work, the duration of the proposed work, and a contact number.

**N-3. Construction Equipment Sound Control.** All construction equipment, including trucks, shall be professionally maintained and fitted with standard manufacturers' muffler and silencing devices.

**N-4. Sound Barriers.** The project shall employ sound control devices and techniques such as noise shields and blankets during the construction period to reduce the level of noise to surrounding residents. Proposed measures shall be submitted to the Planning Division for approval and shall result in noise attenuation of 5-10 dBA at the property lines. Noise levels shall be monitored for compliance.

#### **Construction Traffic-Related**

**TRA-1. Haul Routes Require Separate Permit.** Apply for a Public Works Permit to establish the haul routes for all construction-related trucks with a gross vehicle weight rating of three tons or more, entering or exiting the site. The Haul Routes shall be approved by the Transportation Engineer.

**TRA-2. Construction Parking.** During construction, free parking spaces for construction workers shall be provided on-site or off-site in a location subject to the approval of the Transportation Engineer.

**TRA-3. Construction Storage/Staging.** Construction vehicle/equipment/materials storage and staging shall be done on-site. No parking or storage shall be permitted within the public right-of-way, unless specifically permitted by the Transportation Engineer with a Public Works permit.

## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact," as indicated by the checklist on the following pages.

- |                                                               |                                                              |                                                                   |
|---------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Aesthetics                | <input type="checkbox"/> Agriculture/Forestry Resources      | <input checked="" type="checkbox"/> Air Quality                   |
| <input checked="" type="checkbox"/> Biological Resources      | <input checked="" type="checkbox"/> Cultural Resources       | <input type="checkbox"/> Energy                                   |
| <input checked="" type="checkbox"/> Geology/Soils             | <input checked="" type="checkbox"/> Greenhouse Gas Emissions | <input checked="" type="checkbox"/> Hazards & Hazardous Materials |
| <input type="checkbox"/> Hydrology/Water Quality              | <input type="checkbox"/> Land Use/Planning                   | <input type="checkbox"/> Mineral Resources                        |
| <input checked="" type="checkbox"/> Noise                     | <input type="checkbox"/> Population/Housing                  | <input type="checkbox"/> Public Services                          |
| <input type="checkbox"/> Recreation                           | <input checked="" type="checkbox"/> Transportation           | <input checked="" type="checkbox"/> Tribal Cultural Resources     |
| <input checked="" type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Wildfire                            | <input type="checkbox"/> Mandatory Findings of Significance       |

## DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (1) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (2) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Prepared by: Rincon Consultants

Signature

Date

Approved by: Beth Anna Cornett, Senior Planner, City of Santa Barbara

  
Signature

11/06/2025  
Date

## ENVIRONMENTAL CHECKLIST

The following checklist contains questions concerning potential changes to the environment that may result if this project is implemented. The potential level of significance should be indicated as follows:

**Significant:** Known substantial environmental impact. Further review is needed to determine whether there are feasible mitigation measures and/or alternatives to reduce the impact.

**Potentially Significant:** Unknown, potentially significant impact that needs further review to determine significance level and whether any impact identified as potentially significant can be mitigated.

**Less than Significant with Mitigation:** Potentially significant impact that is avoided or reduced to less than significant level with identified feasible mitigation measures.

**Less than Significant:** Impact that is not substantial or significant.

**Beneficial Impact:** Impact would improve environmental conditions.

**No Impact:** Project would not cause this type of impact.

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level.
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration pursuant to Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
  - a. Earlier Analyses Used. Identify and state where they are available for review.
  - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
  - c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
  - a. The significance criteria or threshold, if any, used to evaluate each question; and
  - b. The mitigation measure identified, if any, to reduce the impact to less than significant.

## 1. Aesthetics and Visual Resources

| 1. AESTHETICS AND VISUAL RESOURCES                                                                                                                                                                                                                                                                                                                                         | Level of Significance   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Except as provided in Public Resources Code Section 21099* (CEQA provisions for infill projects within a transit priority area), would the project:                                                                                                                                                                                                                        |                         |
| a) Have a substantial adverse effect on a scenic vista?                                                                                                                                                                                                                                                                                                                    | Less than Significant   |
| b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?                                                                                                                                                                                                                    | No Impact               |
| c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | Less than Significant   |
| d) Create a new source of substantial light or glare which would adversely affect surrounding areas or important public day or nighttime views in the area?                                                                                                                                                                                                                | Potentially Significant |

\* CEQA California A Public Resources Code §21099(d)(1): “Aesthetic and parking impacts of a residential, mixed-use, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment. (2)(A) This subdivision does not affect, change, or modify the authority of a lead agency to consider aesthetic impacts pursuant to local design review ordinances or other discretionary powers provided by other laws or policies. (B) For the purposes of this subdivision, aesthetic impacts do not include impacts on historical or cultural resources.” For the purposes of §21099, “transit priority area” means an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in the Transportation Improvement Plan or applicable regional transportation plan.

### Discussion

**Issues:** Issues associated with visual resources and aesthetics include the potential blockage or substantial alteration of important public scenic views, project on-site aesthetic character and compatibility with the surrounding area, substantial changes in exterior lighting and shade/shadow, and introduction of substantial new sources of glare.

**Impact Evaluation Guidelines:** Aesthetic quality, whether a project is visually pleasing or unpleasing, may be perceived and valued differently from one person to the next, and depends in part on the context of the environment in which a project is proposed. The significance of visual changes is assessed qualitatively based on consideration of the proposed physical change and project design within the context of the surrounding visual setting. First, the existing visual setting is reviewed to determine whether important existing visual resources are involved, based on consideration of whether a view contains one or more important visual resources, has scenic qualities, and is viewed from a heavily used public viewpoint, such as a public gathering area, major public transportation corridor, or area of intensive pedestrian or bicycle use. Under CEQA, the evaluation of a project’s potential impacts to scenic views is focused on views from public (as opposed to private) viewpoints and larger community wide views (those things visible to a larger community, as opposed to select individuals). The visual changes associated with the project are then assessed qualitatively to determine whether the project would substantially degrade or obstruct existing important public scenic views or impair the visual context of the Waterfront area or a designated historic resource and whether the visual changes associated would result in

individual or cumulative substantial effects associated with important public scenic views, on-site visual aesthetics, or lighting.

Significant visual resources impacts may potentially result from:

1. Substantial obstruction of important public or communitywide scenic views. Public views may be framed (e.g., view corridor), wide angle, or panoramic. Important scenic views include, but is not limited to the Pacific Ocean, Stearn's Wharf, the Harbor, Douglas Family Preserve, Montecito Country Club, Andree Clark Bird Refuge, Bellosguardo, Santa Barbara Zoo, coastal bluffs and shoreline, creeks, estuaries, lagoons, riparian areas, parks and open space, historic structures, sites, and trees important for their visual quality, Channel Islands, Foothills, Riviera, and Santa Ynez Mountains.
2. Substantial damage to scenic resources within a state scenic highway (Highway 154). Impacts to local scenic roads should also be considered. These include Highway 101; Cabrillo Boulevard between U.S Highway 101 and Castillo Street; Sycamore Canyon Road (144)/Stanwood Drive (Highway 192)/Mission Ridge Road (Highway 192)/Mountain Drive to the Old Mission on Los Olivos Street, or Shoreline Drive from Castillo Street to the end of Shoreline Park.
3. Substantial negative aesthetic effects or incompatibility with surrounding land uses or structures due to project size, massing, scale, density, architecture, signage, or other design features.
4. Substantial degradation of important public or communitywide scenic views or the visual quality of the site through extensive grading and changes in topography, removal of substantial amounts of vegetation and trees visible from public areas without adequate landscaping; or substantial loss of important public open space.
5. Substantial light and/or glare that substantially affects offsite properties and/or sensitive receptors, safe travel, sensitive wildlife, or substantially affects important public views.

## Existing Conditions and Project Impacts

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### 1.a) Scenic Views

**Less Than Significant Impact.** The Project site is located on Lavigia Hill within the Alta Mesa neighborhood of Santa Barbara. Although the Project site is elevated and includes undeveloped areas with some native and non-native vegetation, the Project site is not identified in the City's General Plan as a designated scenic vista (City of Santa Barbara 2011). Public views of the Project site are limited due to the location of public roads elevation being lower than the surrounding residential development, fencing, and elevated topography of the site. Limited portions of the Project site, such as the south-west slope, may be visible from Cliff Drive. La Coronilla Park is visible from Dolores Drive. Scenic resources visible from the vicinity of the Project site include La Coronilla Park, the Pacific Ocean, coastal shoreline, and Santa Ynez Mountains.

Construction activities would involve temporary visual changes to the Project site, including equipment staging, vegetation removal, and grading. These activities would be visible from public roadways such as Dolores Drive and La Coronilla Drive. However, construction activities would not obstruct scenic views of the Pacific Ocean, coastal shoreline, and Santa Ynez Mountains due to intervening development and topography, which restrict current views of these scenic resources. Construction activities would temporarily obstruct views of La Coronilla Park; however, construction would be temporary, and the presence of construction equipment would cease upon completion of construction activities at La Coronilla Park. During operation, the offsite improvements (such as the proposed pipelines and PRV) would be located primarily underground. Minor aboveground appurtenances would be visually consistent with other City water infrastructure.

Figure 6 and Figure 7 in the *Project Description* show visual renderings of the proposed Project elements. As shown in the visual renderings in Figure 7 in the *Project Description*, due to intervening topography, the proposed improvements at the Vic Trace Reservoir parcel would generally not be visible from public vantage points, including La Coronilla Park and adjacent roadways. The visual character of La Coronilla Park would be similar to existing conditions. New structures, including the Valve Building and IT/Communications Building, would be located near the Vic Trace Reservoir parcel entrance and designed to blend with the surrounding environment. Many of the site's existing communication towers would be removed and consolidated into one or two towers not to exceed 65 ft (SBMC Section 30.185.410.C.1a). Aesthetic modifications to new towers may be incorporated (e.g., tree-like concealed tower). Landscaping with drought-tolerant, fire-resistant, and native species would be installed to restore and enhance the visual character of the Vic Trace Reservoir parcel once construction has concluded. Fencing visible from public rights-of-way would be of uniform height and design, and lighting would be limited to safety needs during occasional nighttime maintenance, consistent with the City's Outdoor Lighting Ordinance.

Therefore, construction and operation of the Project would not result in a substantial adverse effect on a scenic vista, and impacts would be less than significant.

### 1.b) Scenic Highways and Roadways

**No Impact.** The Project site is not located within the viewshed of a State-designated scenic highway. The nearest State-designated scenic highway is State Route 154, located approximately 3.5 miles to the northwest of the Project site (California Department of Transportation 2018). Additionally, the Project site is not adjacent to or visible from any local scenic roads identified by the City of Santa Barbara. Therefore, the Project would have no impact on scenic highways and roadways.

### 1.c) Visual Character and Quality

**Less Than Significant Impact.** Pursuant to CEQA Guidelines Section 21071, the City of Santa Barbara qualifies as an "urbanized area" even though its individual population is less than 100,000 persons. This is because the combined population of Santa Barbara and the contiguous incorporated City of Goleta meets or exceeds the 100,000-person threshold required under subdivision (a)(2) of Section 21071. This provision allows a city with fewer than 100,000 residents to be considered urbanized if it is adjacent to one or two other incorporated cities and their combined population reaches at least 100,000 persons. Given that the proposed Project would facilitate development in an urbanized area, the impact discussion of visual character and views is focused on consistency with applicable zoning and other regulations governing scenic quality.

The Project site includes two zoning designations: RS-15 (Residential Single Unit, 15,000-square-foot minimum) and P-R (Park and Recreation). The RS-15 zone allows public utility infrastructure as a conditional use, and the P-R zone permits public facilities and infrastructure improvements that support recreational or municipal functions. The proposed Project would be considered an allowable use within both zones and subject to discretionary review and compliance with applicable development standards.

The Project would not conflict with regulations governing scenic quality. As shown in Figure 7, the proposed aboveground structures would have a similar architectural style (e.g. Spanish colonial) as other City facilities and would be consistent in size and scale with existing buildings on-site. The maximum height of the proposed aboveground structures would be 14 feet. The Project would remove approximately 55 trees, including approximately seven coast live oaks, to accommodate grading and construction. In accordance with the City's Tree Preservation Ordinance ([SBMC] Chapter 15.24), all

removed trees would be replaced on-site. The landscape plan includes native, drought-tolerant, and fire-resistant species.

Vegetation removal at the Project site would comply with the Hillside Vegetation Removal Ordinance (SBMC Chapter 22.10), which requires erosion control, slope stabilization, and revegetation. The Project also incorporates stormwater best management practices and slope-sensitive landscaping to maintain hillside integrity. Lighting would be limited to safety needs and designed to minimize glare and spillover, consistent with the City's Outdoor Lighting Ordinance (SBMC Chapter 22.75) and Outdoor Lighting Design Guidelines. Landscaping would comply with the City's Water Efficient Landscape Standards (SBMC Chapter 14.23.005), requiring low-water-use plants and no permanent irrigation.

The Project site is not located within a designated Special Design District, Scenic Overlay Zone, or Coastal Zone View Corridor, and is not visible from any of the City's designated scenic roads. Therefore, the Project would not conflict with applicable zoning or other regulations governing scenic quality, and impacts would be less than significant.

#### 1.d) Lighting and Glare

**Potentially Significant Impact.** The proposed development of the Project site would result in outdoor lighting similar to existing conditions. Exterior lighting would be located at the Valve Building and IT/Communications Building and subject to compliance with the requirements of the City's Outdoor Lighting Ordinance (SBMC Chapter 22.75) and Outdoor Lighting Design Guidelines. The ordinance provides that exterior lighting be shielded and directed to the ground such that no undue lighting or glare would affect surrounding property occupants or roads. Consistent with existing conditions, lighting would only be turned on for safety during occasional nighttime maintenance and repair work. In addition, proposed building materials do not include materials with the potential for substantial glare.

The Project may include installation of a PV solar energy system either on top of the buried reservoir area or on southwest-facing hillslopes within the Vic Trace Reservoir parcel. These locations are not visible from public scenic viewpoints due to intervening topography and fencing. The solar panels would be constructed with anti-reflective coatings and oriented to maximize solar absorption, minimizing the potential for glare. The system would comply with applicable City ordinances and design guidelines; however, there remains a potential that the solar panels would introduce substantial new sources of glare. As such, Project impacts on lighting and glare would be potentially significant and will be analyzed in detail in the EIR.

### Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

## 2. Agriculture and Forestry Resources

| 2. AGRICULTURE AND FORESTRY RESOURCES                                                                                                                                                                                                                                                      | Level of Significance |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                                                                                                                                         |                       |
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?                                              | No Impact             |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?                                                                                                                                                                                                       | No Impact             |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | No Impact             |
| d) Result in the loss of forest land or conversion of forest land to non-forest land?                                                                                                                                                                                                      | No Impact             |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest land?                                                                               | No Impact             |

### Discussion

**Issues:** There are no agricultural designated lands or lands under Williamson Act contracts within the City; however, agricultural lands exist adjacent to the City boundary. Agriculture and forestry resource issues include land use compatibility with nearby agricultural operations and forested lands, and potential indirect impacts that could result in a loss of agriculture and forestry resources (for example, annexation of lands with agricultural resources). Increased density and intensity of land uses have the potential to affect the productivity of nearby agricultural lands.

**Impact Evaluation Guidelines:** A significant impact could occur from projects that result in the conversion of lands suitable for agriculture to non-agricultural uses or result in a disruption to surrounding agricultural operations.

## Existing Conditions and Project Impacts

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### 2.a-e) Agriculture and Forestry Resources

**No Impact.** The Project site contains no agricultural uses, agricultural zoning, or Williamson Act contracts. The Project site is designated as Urban and Built-up Land by the Department of Conservation Farmland Mapping and Monitoring Program and does not contain Important Farmland (Department of Conservation 2022). The Project site does not include active farmland, forest land, or protected agricultural soils, and the Project would not conflict with zoning for agriculture or forest use or involve other changes in the existing environment which could result in conversion of farmland or forest land to other uses. Therefore, there would be no impact on agricultural or forestry resources.

### Mitigation Measures

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No mitigation is required.

### 3. Air Quality

| 3. AIR QUALITY                                                                                                                                                                                                  | Level of Significance   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                              |                         |
| a) Conflict with or obstruct implementation of the applicable air quality plan?                                                                                                                                 | Less than Significant   |
| b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is designated in non-attainment under an applicable federal or state ambient air quality standard? | Potentially Significant |
| c) Expose sensitive receptors to substantial pollutants?                                                                                                                                                        | Potentially Significant |
| d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?                                                                                               | Less than Significant   |

### Discussion

**Issues:** Air quality issues involve pollutant emissions from vehicle exhaust, stationary sources (e.g. gas stations, boilers, diesel generators, dry cleaners, oil and gas processing facilities, etc.), and minor stationary sources called “area sources” (e.g. residential heating and cooling, fireplaces, etc.) that contribute to smog, particulates, nuisance dust associated with grading and construction processes, and nuisance odors. Emissions of harmful air pollutants are of particular concern to sensitive receptors. Sensitive receptors are populations who are more susceptible to the effects of air pollution than the population at large and include children, persons over 65 years of age, athletes, and persons with cardiovascular or chronic respiratory diseases. Land uses typically associated with sensitive receptors include residences, schools, parks, playgrounds, recreation facilities, childcare centers, retirement homes, convalescent homes, hospitals, and health care facilities and clinics.

Smog, or ozone, is formed in the atmosphere through a series of photochemical reactions involving interaction of oxides of nitrogen (NO<sub>x</sub>) and reactive organic compounds (ROC) (referred to as ozone precursors) with sunlight over a period of several hours. Primary sources of ozone precursors in the South Coast area are vehicle emissions. Sources of particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) include demolition, grading, road dust, agricultural tilling, mineral quarries, and vehicle diesel exhaust.

The City of Santa Barbara is part of the South Central Coast Air Basin. The City is subject to the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS). The CAAQS apply to seven pollutants: photochemical ozone (O<sub>3</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), coarse particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), and lead (Pb). There are also established state standards for other criteria pollutants including sulfates, hydrogen sulfide (H<sub>2</sub>S), and visibility reducing particulates. The Santa Barbara County Air Pollution Control District (APCD) provides oversight on compliance with air quality standards and preparation of the County Clean Air Plan (2013) and the Ozone Plan (2022).

Santa Barbara County (County) is currently in attainment of most federal and state standards. The County does not presently meet the state PM<sub>10</sub> standard and is designated nonattainment-transitional for the state ozone standard. See Table 5.

**Table 5 County Attainment Status of Federal and State Ambient Air Quality Standards (2025)**

| Criteria Pollutant               | Federal Attainment Status | State Attainment Status           |
|----------------------------------|---------------------------|-----------------------------------|
| O <sub>3</sub> 8-hour            | Attainment                | <b>Nonattainment-Transitional</b> |
| O <sub>3</sub> 1-hour            | No standard               | Attainment                        |
| PM <sub>10</sub>                 | Attainment                | <b>Nonattainment</b>              |
| PM <sub>5</sub>                  | Unclassified              | Unclassified                      |
| CO                               | Attainment                | Attainment                        |
| Pb                               | Attainment                | Attainment                        |
| SO <sub>2</sub>                  | Unclassified              | Attainment                        |
| NO <sub>2</sub>                  | Unclassified              | Attainment                        |
| S <sub>x</sub>                   | No Standard               | Attainment                        |
| H <sub>2</sub> S                 | No Standard               | Attainment                        |
| Vinyl Chloride                   | No Standard               | Unclassified                      |
| Visibility Reducing Particulates | No Standard               | Attainment                        |

The APCD has analysis and permitting requirements regarding toxic air contaminants (TACs) generated from activities such as gasoline dispensing, dry cleaning, freeways, manufacturing, etc., and may require projects with high TAC emissions to mitigate or redesign features of the project to avoid excessive health risks. The APCD requires submittal of an asbestos notification form for each regulated structure that is proposed to be demolished or renovated. The California Air Resources Control Board (CARB) and APCD also recommend 500-foot buffers between Highway 101 and new residential developments or other sensitive receptors to reduce potential health risks associated with traffic-related air pollutant emissions, particularly diesel particulates. Based on analysis in the certified Final Program EIR for the City of Santa Barbara General Plan Update (2011; herein referred to as the General Plan EIR), the City established an ordinance (SBMC 22.65) that requires design standards for new residential sensitive receptor structures or uses within 250 feet of Highway 101 (excluding minor additions or remodels of existing homes or the construction of one new residential unit on vacant property), that address highway exhaust effects. Certain projects also have the potential to create objectionable odors that could create a substantial nuisance to neighboring residential areas or sensitive receptors and should be evaluated in CEQA documents.

**Impact Evaluation Guidelines:** A project may create a significant air quality impact associated with criteria air pollutants from the following:

1. Exceeding an APCD pollutant threshold; inconsistency with APCD regulations; or exceeding population forecasts in the adopted County Clean Air Plan (2013) or Ozone Plan (2022).
2. Exposing sensitive receptors, such as children, persons over 65 years of age, or persons with cardiovascular or respiratory conditions, to substantial pollutant concentrations.
3. Placement of sensitive land uses within 250 feet of Highway 101.
4. Substantial unmitigated nuisance dust during earthwork or construction operations.
5. Creation of nuisance odors inconsistent with APCD regulations.

**Long-Term (Operational) Air Quality Impact Guidelines:** The City of Santa Barbara uses the APCD thresholds of significance for evaluating air quality impacts. In accordance with the APCD Environmental Review Guidelines (2015), the APCD does not consider a proposed project to a significant air quality impact on the environment if operation of the project would:

1. Emit (from all project sources, both stationary and mobile) less than 240 pounds per day for ROC and NO<sub>x</sub>, and 80 pounds per day for PM<sub>10</sub>;
2. Emit less than 25 pounds per day of ROC or NO<sub>x</sub> from motor vehicle trips only;
3. Not cause or contribute to a violation of any CAAQS or NAAQS (except ozone);
4. Not exceed the APCD health risks public notification thresholds adopted by the APCD Board of 10 excess cancer cases in a million for cancer risk and a Hazard Index of more than one (1.0) for non-cancer risk); and
5. Be consistent with the adopted federal and state air quality plans applicable to the Santa Barbara Air Basin.

Substantial long-term project emissions could potentially stem from stationary sources which may require permits from the APCD and from motor vehicles associated with the project and from other mobile sources. Examples of stationary emission sources that require permits from APCD include gas stations, automobile repair body shops, diesel generators, boilers and large water heaters, dry cleaners, oil and gas production and processing facilities, and wastewater treatment facilities.

**Short-Term (Construction) Impacts Guidelines:** Projects involving grading, paving, construction, and landscaping activities may cause localized nuisance dust impacts and increased particulate matter (PM<sub>10</sub>). Dust-related impacts can be mitigated and less than significant with the application of standard dust control mitigation measures pursuant to APCD rules and regulations (e.g., Rule 345, Control of Fugitive Dust from Construction and Demolition Activities) and City ordinance provisions ([SBMC] 22.04.020), such as dampening graded areas and soil stockpiles. Exhaust from construction equipment also contributes to air pollution.

Quantitative thresholds of significance are not currently in place for short-term or construction emissions for non-stationary sources because cumulative basin-wide effects are not identified as significant. However, APCD uses a criterion for stationary sources, which is also considered a guideline for evaluating impacts of construction emissions for non-stationary source projects. The criterion states that a project's emissions from construction equipment shall not exceed 25 tons of any pollutant except CO within a 12-month period. Standard equipment exhaust mitigation measures are recommended by APCD to be applied to projects.

**Cumulative Impacts and Consistency with Clean Air Plan (2013) and Ozone Plan (2022):** Consistency with the Clean Air Plan and Ozone Plan means that emissions associated with a project are accounted for within each Plan's emissions growth assumptions, land use and population projections, and that a project is consistent with policies adopted within each plan. If the project-specific impact exceeds the ozone precursor significance threshold, it is also considered to have a considerable contribution to cumulative impacts. If a project would exceed the Clean Air Plan growth projections, then the project's impact may also be considered for whether it represents a considerable contribution to cumulative air quality impacts. The Santa Barbara County Association of Governments and CARB on-road emissions forecasts are used as a basis for vehicle emission forecasting. If a project provides for increased population growth beyond that forecasted in the most recently adopted Clean Air Plan and Ozone Plan, or if a project does not incorporate appropriate air quality mitigation and control measures, or is inconsistent with APCD rules and regulations, then a project may be found inconsistent with the Clean Air Plan and may constitute a significant impact on air quality.

## Existing Conditions and Project Impacts

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### 3.a) Air Quality Plans

**Less Than Significant Impact.** Direct and indirect emissions associated with the Project are accounted for in the Clean Air Plan and Ozone Plan emissions growth assumptions for the Air Basin. Appropriate standard conditions related to air quality, including construction dust suppression, would be applied to the Project, consistent with Clean Air Plan, Ozone Plan, APCD rules, and City policies and ordinance provisions, and are identified in the Project Description. The Project is found consistent with the Clean Air Plan and Ozone Plan; therefore, Project impacts would be less than significant.

### 3.b) Cumulative Impacts

**Potentially Significant Impact.** Construction of the proposed Project could result in emissions of pollutants due to grading, fumes, and vehicle exhaust. Sensitive receptors located nearby could be affected by dust and particulates from grading and exhaust emissions during project construction. Diesel and gasoline powered construction equipment also emit particulate matter and ozone precursors NO<sub>x</sub>, and ROC. Project-related emissions have the potential to result in a cumulatively considerable net increase of O<sub>3</sub> and PM<sub>10</sub>, for which the State is in nonattainment. This impact would be potentially significant and will be analyzed in detail in the EIR.

### 3.c) Sensitive Receptors

**Potentially Significant Impact.** Sensitive receptors can be found in areas that contain residences, health care facilities, elder-care facilities, rehabilitation centers, schools, daycare centers, and parks. Air emissions, including TACs have adverse implications for public health, particularly for sensitive receptors. Multiple sensitive receptors (single-family residences) are located adjacent to the Project site. Construction of the Project has the potential to expose these sensitive receptors to pollutant concentrations. This impact would be potentially significant and will be analyzed in detail in the EIR.

### 3.d) Odors

**Less Than Significant Impact.** The Project is limited to potable water infrastructure and would not include land uses involving odors or smoke. The Project would not contain features with the potential to emit substantial odorous emissions, from sources such as commercial cooking equipment, combustion or evaporation of fuels, sewer systems, or solvents and surface coatings. Due to the nature of the proposed land use of the Project, Project impacts related to odors would be less than significant.

## Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

## 4. Biological Resources

| 4. BIOLOGICAL RESOURCES                                                                                                                                                                                                                                                                                             | Level of Significance   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                                                                                                                                  |                         |
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S Fish and Wildlife Service? | Potentially Significant |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?                                                          | Potentially Significant |
| c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?                                                                                        | No Impact               |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?                                                                                  | Less than Significant   |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?                                                                                                                                                                                 | Potentially Significant |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?                                                                                                                                | No Impact               |

## Discussion

**Issues:** Biological resources issues involve the potential for a project to substantially affect biologically important natural vegetation and wildlife, particularly species that are protected as rare, threatened, or endangered by federal or state wildlife agencies, and their habitats.

**Impact Evaluation Guidelines:** Existing native wildlife and vegetation on a project site are assessed to identify whether they constitute important biological resources, based on the types, amounts, and quality of the resources within the context of the larger ecological community. If important or sensitive biological resources exist, project effects on the resources are qualitatively evaluated to determine whether the project would substantially affect these important biological resources. Significant biological resource impacts may potentially result from substantial disturbance to important wildlife and vegetation in the following ways:

1. Elimination, substantial reduction or disruption of important natural vegetative communities, wildlife habitat, migration corridors, or habitats supporting sensitive species such as oak woodland, coastal strand, riparian, and wetlands.
2. Substantial effect on a protected plant or animal species listed or otherwise identified or protected as endangered, threatened or rare.

3. Substantial loss or damage to biologically important native trees, such as oak or sycamore trees

## Existing Conditions and Project Impacts

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### 4.a) Candidate, Special Status, or Rare Species

**Potentially Significant Impact.** No special-status plant species were observed within the Project site during a reconnaissance-level field survey, no threatened or endangered plant species have a potential to occur within the Project site, and no designated critical habitat occurs within or adjacent to the Project site. Due to limited habitat within the Project site and low potential for non-listed special-status plant species to occur, the number of individuals affected by the Project would be low, if any, and would not result in population-level effects on these species.

One fully protected wildlife species, white-tailed kite (*Elanus leucurus*), has a moderate potential to occur within the Project site. This species may utilize suitable nesting and roosting habitat, such as large coast live oak, eucalyptus, and other ornamental trees located within the Project site. Suitable nesting habitat for the species may be impacted by the Project, and potentially significant impacts may result if construction occurs while the species is present within or adjacent to the work areas. Four additional special-status wildlife species, which were not observed or detected during the biological survey, were determined to have potential to occur within the Project site based upon known ranges, habitat preferences for the species, and species occurrence records. Coastal whiptail (*Aspidoscelis tigris stejnegeri*), coast horned lizard (*Phrynosoma blainvillii*), coast patch-nosed snake (*Salvadora hexalepis virgulata*), and western red bat (*Lasiurus frantzii*) have a low potential to occur within the Project area. Marginally suitable habitat for these species (rocky or vegetated drainages with limited or no riparian vegetation) is present adjacent but outside of the Project site. Project impacts to these special-status wildlife species could be potentially significant and will be analyzed in detail in the EIR.

### 4.b) Natural Communities; Riparian Habitats

**Potentially Significant Impact.** One sensitive natural community occurs within the Project site: lemonade berry scrub (*Rhus integrifolia* shrubland alliance), which is listed on the California Department of Fish and Wildlife's Sensitive Natural Communities List. Direct impacts would occur to lemonade berry scrub due to excavation and grading around the reservoir during construction, which has the potential to remove up to 0.29 acres of lemonade berry scrub. These impacts would be potentially significant and will be analyzed in detail in the EIR.

### 4.c) Wetlands

**No Impact.** The Project is not located within or adjacent any jurisdictional waters or wetlands (including marshes, vernal pools, etc.). No impact on wetlands would occur.

### 4.d) Wildlife Dispersal and Migration Corridors

**Less than Significant Impact.** No wildlife movement corridors or wildlife nursery sites are present within the Project site. The site is surrounded by development and does not serve as a connector between larger habitat areas. Additionally, no water sources or features are present besides the reservoir, which is covered and does not allow wildlife access. The site likely supports local wildlife for foraging needs; however, it is expected that construction activities may temporarily affect these species by causing them to avoid the area. Construction would be generally limited to daylight hours; however, some nighttime work may occur on-site and within the adjacent ROW. Construction-related disturbance would be

temporary, and wildlife could resume using the area once Project construction is completed. Impacts would be less than significant.

#### **4.e) Local Policies and Ordinances**

**Potentially Significant Impact.** Several coast live oak trees are documented and mapped within the Project site. Several street trees also occur off the paved roadways adjacent to off-site improvements. Proposed vegetation removal includes approximately seven coast live oaks, which are protected by ([SBMC] Section 15.20. Therefore, this impact would be potentially significant, and will be analyzed in detail in the EIR.

#### **4.f) Adopted Conservation Plans**

**No Impact.** No Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan is applicable to the City or the Project site. No impact would occur.

### **Mitigation Measures**

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Mitigation may be required and will be discussed in detail in the EIR.

# 5. Cultural Resources

| 5. CULTURAL RESOURCES                                                                                              | Level of Significance   |
|--------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                 |                         |
| a) Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA §15064.5?      | Less than Significant   |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA §15064.5? | Potentially Significant |
| c) Disturb any human remains, including those interred outside of formal cemeteries?                               | Less than Significant   |

## Discussion

### Issues:

Archeological resources are evidence of past cultural occupation, seasonal use, or ephemeral activity reflected in artifacts, food remains, or other evidence that provide insight into past lifestyles and their evolution through time. Prehistoric resources, dating back at least 13,000 years, extend throughout the Santa Barbara Channel, predating European and American colonization. This evidence can be identified on the ground surface and potentially extending several feet below the surface depending upon the nature of cultural deposit, and geomorphological processes including erosion that may bury a location with alluvial sediment.

Historic resources are evidence of the region’s cultural shifts from Spanish colonization and Franciscan missions, to subsequent Spanish-Mexican, American settler, and immigrant occupations. The SBMC defines historic resources as structures, sites, cultural landscapes, or features that are designated or eligible for designation as historically significant.

**Impact Evaluation Guidelines:** Archaeological and historical resource impacts are evaluated based on review of available cultural resource documentation and data gathered from records searches. Existing conditions on a site are assessed to identify whether important or unique resources exist, based on criteria specified in the State CEQA Guidelines §15064.5 and City Master Environmental Assessment Guidelines for Archaeological Resources (April 2025) and Historical Resources (April 2025), summarized as follows:

1. For archaeological resources, there is a high probability the resource:
  - a. Contains information needed to answer important scientific research questions and there exists a demonstrable public interest in that information.
  - b. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
  - c. Is directly associated with a scientifically recognized important prehistoric or historic event or person.
2. For archaeological and historic resources, the resource:
  - a. Is designated, or meets criteria for inclusion on a national, state, or local landmark or historic resource register. This includes, but is not limited to, the National Register of Historic Places, National Historic Landmarks, California Register of Historical Resources, California Registered Historical Landmarks, City of Santa Barbara Landmarks, and City of Santa Barbara Structures of Merit.

- b. Is determined by the City to be significant, based on substantial evidence.

If important archaeological or historic resources exist on the site, project changes are evaluated to determine whether they would substantially affect these resources. A project could have a significant impact if it may cause a substantial adverse change in the characteristics of a resource that convey its significance or justify its eligibility for inclusion in a national, state, or local register. Impacts may include physically damaging, destroying, relocating, or altering all or part of a resource, altering the characteristics of the surrounding environment that contribute to the resource's significance, neglecting the resource to the extent that it deteriorates or is destroyed, or the incidental discovery of a resource without proper notification and protocols.

## Existing Conditions and Project Impacts

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### 5.a) Historical Resources

**Less than Significant Impact.** The Project site contains one property over 45 years old: the Vic Trace Reservoir and an associated valve structure. Vic Trace Reservoir was recorded and evaluated for listing in the National Register of Historic Places, California Register of Historical Resources, and for local listing as a City of Santa Barbara structure of merit or historic landmark. As a result of the evaluation, Vic Trace Reservoir is recommended ineligible for listing in the National Register of Historic Places, California Register of Historical Resources, and as a local landmark and structure of merit under all applicable criteria. Therefore, Vic Trace Reservoir is not considered: a historic property under Section 106, a historical resource under CEQA (Section 15064.5[a]), or a historic resource under Chapter 2.3 of the City's MEA. Impacts to historical resources would be less than significant.

### 5.b) Archaeological Resources

**Potentially Significant Impact.** The Project site has been previously disturbed from the construction and maintenance of Meigs Road, Dolores Drive, La Coronilla Drive, and La Vista Del Oceano; grading and cut and fill activities associated with the construction of the Vic Trace Reservoir and adjacent communications facilities; underground utility installation; and landscaping. Nevertheless, portions of the Project site are considered sensitive for archaeological resources. The City's Archaeological Resources Sensitivity Area Map (City of Santa Barbara 2025) indicates a portion of the proposed Vic Trace Reservoir Outlet Main Replacement alignment and the proposed La Vista Del Oceano PRV Vault area are located within the Prehistoric Resources Period sensitivity area and have an increased sensitivity for archaeological resources. Given the Project site's sensitivity for archaeological resources, impacts to archaeological resources, if encountered during ground-disturbing activities associated with Project construction, would be potentially significant. These impacts will be analyzed in detail in the EIR.

### 5.c) Human Remains

**Less Than Significant Impact.** There is no evidence that the Project site contains human remains. Standard conditions of approval for the Project include procedures pursuant to State regulations for the unanticipated discovery of human remains. To minimize or avoid potential impacts, if any human remains are discovered, all construction activities would cease in the immediate area, and the Santa Barbara County Coroner would be contacted in accordance with Title 14 California Code of Regulations (CCR) Section 15064.5(e). If the coroner determines that the human remains are of Native American origin, the Native American Heritage Commission (NAHC) would be notified to determine the Most Likely Descendent (MLD) for the area. The MLD would make recommendations for the arrangements for the

human remains per Public Resources Code (PRC) Section 5097.98. Therefore, impacts on human remains would be less than significant.

### **Mitigation Measures**

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Mitigation may be required and will be discussed in detail in the EIR.

## 6. Energy

| 6. ENERGY                                                                                                                                                                          | Level of Significance |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                                 |                       |
| a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? | Less than Significant |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?                                                                                      | Less than Significant |

### Discussion

**Issues:** Issues include the potential for the project to result in impacts on energy conservation and/or consumption. A project may have the potential to cause such impacts if it would result in the inefficient, wasteful, or unnecessary consumption of energy from sources including construction and operational equipment, electricity, natural gas, and transportation fuel supplies and/or resources. A project may also cause such impacts if it would conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

**Impact Evaluation Guidelines:** A project has the potential to result in a significant impact if it would:

1. Use large amounts of fuel or energy in an unnecessary, wasteful, or inefficient manner;
2. Constrain local or regional energy supplies, affect peak and base periods of electrical or natural gas demand, require or result in the construction of new electrical generation and/or transmission facilities, or necessitate the expansion of existing facilities, the construction of which could cause significant environmental effects; or
3. Conflict with existing energy standards, including standards for energy conservation, in state or local plans.

### Existing Conditions and Project Impacts

#### 6.a-b) Energy Conservation and Consumption

**Less than Significant Impact.** Project construction would primarily consume fuel to operate heavy equipment, light-duty vehicles, and machinery. Temporary grid power may be used for construction trailers or electric equipment. These energy demands would be short-term and typical for similar projects in the region. Contractors would comply with Title 13, Section 2449 of the California Code of Regulations, which requires fleet owners to retrofit, repower, or replace older diesel engines and follow idling limits and reporting requirements to reduce emissions and fuel use. Contractors would also follow Title 13, Section 2485, which prohibits unnecessary idling of diesel-fueled commercial vehicles. Additionally, heavy-duty equipment must meet United States Environmental Protection Agency Construction Equipment Fuel Efficiency Standards, which promote cleaner technologies and efficient fuel use. These requirements, combined with cost-efficiency considerations, would prevent wasteful or unnecessary fuel consumption.

Once operational, the Project would increase onsite electricity use by approximately 70,000 kWh per year to power the upgraded La Coronilla Pump Station and new security systems. However, water system-wide electricity use will remain the same as the La Coronilla Pump Station will replace an existing nearby

water pump station, which will transition to a backup pump station only with little electrical use. The Project may include a 60-kW PV solar system to offset this demand. The system would consist of solar panels, wiring, conduits, an inverter, electrical meter, and potentially battery storage. Panels would cover about 4,500 square feet, installed either atop the reservoir or on southwest-facing hillslopes to maximize solar exposure.

All new structures, including the Valve Building and IT/Communications Building, would be designed and built to comply with California Title 24 Building Energy Efficiency Standards. These standards, enforced by local agencies, ensure buildings meet energy performance goals and maintain environmental quality. The Project also supports the City's 2024 Climate Action Plan (CAP), *Together to Zero*, which targets carbon neutrality by 2035. The CAP emphasizes reducing emissions from municipal operations, transitioning away from natural gas, and increasing renewable energy generation. By replacing aging infrastructure with energy-efficient equipment, such as booster pumps, disinfection systems, and remote monitoring technologies, the Project would reduce long-term energy consumption and improve operational efficiency. If implemented, the PV system would directly support CAP goals for clean energy and electrification of municipal facilities.

Because the Project is consistent with the General Plan and CAP and would be required to meet Title 24 energy efficiency standards, it would not expend energy in a wasteful, inefficient, or unnecessary manner, nor would it conflict with energy plans or policies. Project impacts would be less than significant.

## Mitigation Measures

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No mitigation is required.

## 7. Geology and Soils

| 7. GEOLOGY AND SOILS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Level of Significance   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |
| a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: <ul style="list-style-type: none"> <li>i. Rupture of a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42)</li> <li>ii. Strong seismic ground shaking?</li> <li>iii. Seismic-related ground failure, including liquefaction?</li> <li>iv. Landslides?</li> </ul> | Less than Significant   |
| b) Result in substantial soil erosion or the loss of topsoil?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Potentially Significant |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, collapse or sea cliff failure?                                                                                                                                                                                                                                                                                                                                                               | Less than Significant   |
| d) Be located on expansive soils, as defined Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risk to life or property?                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Less than Significant   |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?                                                                                                                                                                                                                                                                                                                                                                                                                                | No Impact               |
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Potentially Significant |

### Discussion

**Issues:** Geophysical impacts involve geologic and soil conditions, and their potential to create physical hazards affecting persons or property; or substantial changes to the physical condition of the site. Included are earthquake-related conditions such as fault rupture, ground shaking, liquefaction (a condition in which saturated soil loses shear strength during earthquake shaking), or seismic waves; or unstable soil or slope conditions, such as landslides, sea cliff retreat, subsidence (the downward shifting of the Earth's surface; can result in sinkholes); and extensive grading or topographic changes.

Erosion is the movement of rocks and soil from the Earth's surface by wind, rain, or running water. Several factors influence erosion, such as topography, the size of soil particles (larger particles are more prone to erosion), and vegetation cover, which prevents erosion. Projects in areas with high erosion potential could reduce natural ground cover, create exposed cut or fill slopes and increase loss of surface soils and downstream sedimentation. Removal of vegetation and increased earthwork would potentially expose soils to erosion.

Expansive soils are typically composed of clays and are characterized by the ability to undergo significant volume change (shrink and swell) because of variation in soil moisture content. Soil moisture content can

change due to many factors, including perched groundwater, landscape irrigation, rainfall, and utility leakage.

Soil permeability determines the degree to which soil can accept sewage discharge over a period of time. Permeability is measured by percolation rate. In locations where soil does not have percolation rates adequate to manage the peak daily flow from sewage disposal systems, soil and groundwater contamination could occur.

Unique geologic features are features that are unique to the field of geology and typically embody distinct characteristics of a geological principle, provide important information to the field of geology, and/or are the best example of its kind locally or regionally. Paleontological resources include fossils, which are the preserved remains or traces of animals, plants, and other organisms from prehistoric time (i.e., the period before written records). Fossils and traces of fossils are preserved in sedimentary rock units (formed by the deposition of material at the Earth's surface) and are more likely to be preserved subsurface, where they have not been damaged or destroyed by previous ground disturbance or natural causes, such as erosion by wind or water.

**Impact Evaluation Guidelines:** Potentially significant geophysical impacts may result from:

1. Exposure of people or structures to risk of loss, injury, or death involving unstable earth conditions due to seismic conditions (such as earthquake faulting, ground shaking, liquefaction, or seismic waves), landslides, or sea cliff retreat.
2. Exposure to or creation of unstable earth conditions due to geologic or soil conditions, such as landslides, settlement, or expansive or collapsible/compressible soils.
3. Substantial erosion of soils.
4. Placement of a septic system in an area with soils not capable of adequately supporting disposal of wastewater or where wastewater could potentially cause unstable conditions or water quality problems.
5. Loss or damage to a unique geological feature or paleontological resource.

## Existing Conditions and Project Impacts

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### 7.a) Seismic Hazards

#### Fault Rupture and Ground Shaking

**Less than Significant Impact.** As with most of Southern California, the Project site is within a seismically active area where active faults could produce ground substantial shaking. The nearest fault is the Lavigia fault, also known as the North Channel Slope fault, located approximately 1,000 feet south of the Project site (Appendix A). No mapped fault traces cross the Project site, and no structural development is proposed within a designated Alquist-Priolo Earthquake Fault Zone. Therefore, the potential for fault rupture at the Project site is considered low, and no fault setback requirements apply.

While the Project may be subject to strong ground shaking in the event of an earthquake, it would not be subject to unusual levels of ground shaking as compared to the rest of the region. All new structures would be designed and constructed in accordance with applicable seismic design standards, such as those identified by the California Building Code (CBC) and American Water Works Association (AWWA). The Project would also upgrade and install new reservoir facilities, including structural improvements specifically intended to reduce the risk of future failures, such as those caused by seismic events. These upgrades would enhance the resilience of critical infrastructure and minimize vulnerability. In the event

an earthquake compromised any Project component during operation, the City would conduct emergency repairs as soon as possible.

Therefore, while the Project site is located within a seismically active area, the Project would not directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death, involving rupture of a known earthquake fault or strong seismic ground shaking, and impacts would be less than significant.

#### Liquefaction

**Less than Significant Impact.** Liquefaction occurs when strong, cyclic motions during an earthquake cause water-saturated soils to lose their cohesion and take on a liquid state. Liquefied soils are unstable and can subject overlying structures to substantial damage. Fine sands and silty sands that are poorly graded and lie below the groundwater table are the soils most susceptible to liquefaction. According to the *Engineering Geology and Geotechnical Engineering Report* prepared in support of the Project, groundwater was not encountered under the Project site within the upper fifty feet, and the Project site is underlain at shallow depths by Santa Barbara Formation bedrock that is sufficiently dense to prevent susceptibility to liquefaction (Appendix A). Therefore, the potential for liquefaction at the Project site is low. All new structures would adhere to applicable seismic design standards. Therefore, the Project would not directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death, involving liquefaction, and impacts would be less than significant.

#### Landslides

**Less than Significant Impact.** The Project site is located on Lavigia Hill, which has moderate slopes and is not within a mapped Seismic Hazard Zone for earthquake-induced landslides (Department of Conservation 2025). While signs of past landsliding have been observed nearby, no active landslides are present on or near the site that could pose a hazard (Appendix A).

Grading for reservoirs, terraces, and access roads may temporarily affect slope stability. However, the Project includes retaining walls, erosion control, and slope stabilization consistent with the California Building Code (CBC), City grading requirements, and hillside protection policies. Vegetation removal would follow the Hillside Vegetation Removal Ordinance ([SBMC] Chapter 22.10), and disturbed areas would be replanted with fire-resistant, slope-stabilizing species.

With these design features and regulatory compliance, the Project would not increase landslide risk. Impacts would be less than significant.

### **7.b) Soil Erosion**

**Potentially Significant Impact.** Soil erosion or the loss of topsoil may occur when soils are disturbed but not secured or restored, to the point where wind or rain events may mobilize disturbed soils, resulting in their transport off the project site. Construction activities involving soil disturbance, such as excavation, stockpiling, and grading could result in increased erosion and sediment transport by stormwater to surface waters.

Construction activities such as grading, excavation, and tree removal would temporarily disturb soil and increase erosion potential at the Vic Trace Reservoir parcel and off-site improvement areas. Approximately 83,000 cubic yards of soil would be exported, primarily from terracing and reservoir excavation. Without controls, disturbed soils could be mobilized by wind or rain and transported off-site.

Although the Project includes erosion control measures—such as compliance with Tier 4 of the City’s Storm Water BMP Guidance Manual, preparation of a Stormwater Pollution Prevention Plan (SWPPP), and restoration with slope-stabilizing landscaping—construction could still result in erosion impacts that warrant further evaluation. Impacts are considered potentially significant. To ensure erosion risks are adequately addressed, a detailed analysis will be included in the EIR.

## 7.c-d) Geologic and Soil Hazards

### Landslides and Liquefaction

See discussion of landslides and liquefaction in Section 7.a.

### Lateral Spreading

**Less than Significant Impact.** Lateral spreading typically occurs in loose, saturated soils adjacent to slopes or free faces, such as riverbanks or coastal bluffs. The Project site is underlain by compacted soils and bedrock and is not adjacent to water bodies or unconsolidated sediment deposits. All new structures, including the buried reservoirs, aboveground buildings, and PRV vaults, would be designed in accordance with applicable design standards, which include seismic design criteria to address potential ground deformation. Therefore, the potential for lateral spreading is low, and impacts would be less than significant.

### Subsidence

**Less than Significant Impact.** Subsidence can result from groundwater withdrawal, soil compaction, or the collapse of underground voids. The Project site does not overlay known subsidence zones, and the presence of bedrock and engineered fill reduces the likelihood of differential settlement. The Project site contains a previously abandoned oil well, drilled in 1935 and capped pursuant to State standards. The Project would involve reabandonment of the oil well to modern standards under the oversight of the California Department of Conservation, Geologic Energy Management Division (CalGEM), further reducing any risk of localized subsidence. All structures would be constructed in compliance with the CBC, which includes requirements for foundation design and soil stability. Therefore, the potential for subsidence is low, and impacts would be less than significant.

### Sea Cliff Retreat

**No Impact.** The Project site is located approximately 0.75 miles inland from the nearest coastal bluff, along Shoreline Drive. The Project site is not located on or adjacent to a sea cliff, and no Project components are sited within the bluff erosion hazard zone identified in the City of Santa Barbara’s Sea-Level Rise Adaptation Plan (City of Santa Barbara 2021a). Therefore, no impact would occur.

### Expansive or Collapsible Soils

**Less than Significant Impact.** Expansive soils are typically clay-rich and prone to volume changes with moisture fluctuations, while collapsible soils are loose and prone to sudden settlement. The Project site is underlain with compacted soils and bedrock, and does not exhibit characteristics of expansive or collapsible soils. All structures would be designed in accordance with the CBC, which requires geotechnical investigation and appropriate foundation design to mitigate soil-related hazards. Therefore, the potential for impacts from expansive or collapsible soils is low, and impacts would be less than significant.

### 7.e) Septic Systems

**No Impact.** The Project would not include the use of any septic tanks or alternative wastewater disposal systems. *No impact* would occur regarding the adequacy of soils to support a septic and alternative wastewater systems.

### 7.f) Unique Geological Features and Paleontological Resources

Geologic mapping indicates the Project site is underlain by three geologic units with high paleontological sensitivity: Quaternary marine terrace deposits, Santa Barbara Formation, and Monterey Formation. Additionally, artificial fill, which is considered to have no paleontological sensitivity, has been identified within the Vic Trace Reservoir parcel. However, the extent or depth of artificial fill within the Vic Trace Reservoir parcel has not been mapped, so its precise distribution remains uncertain.

Significant impacts to paleontological resources could include the destruction, damage, or loss of scientifically important paleontological resources or associated stratigraphic data. Ground-disturbing activities (e.g., grading, excavating, trenching) in undisturbed sediments or geologic units with high paleontological sensitivity have the potential to significantly impact paleontological resources. Ground-disturbing activities for the Project are anticipated to include excavations for the two new reservoirs, valve vaults, entry/exit pits for pipeline lining, and PRV station; terracing of sloped portions of the reservoir parcel; and open-trenching for new main alignments and storm drains. These activities would affect previously undisturbed, high-sensitivity sediments. As such, impacts would be *potentially significant*. This impact will be analyzed in detail in the EIR.

### Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

# 8. Greenhouse Gas Emissions

| 8. GREENHOUSE GAS EMISSIONS                                                                                                      | Level of Significance   |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                               |                         |
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?      | Potentially Significant |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | Potentially Significant |

## Discussion

**Issues:** Global climate change refers to accelerated changes occurring in average worldwide weather patterns, measurable by factors such as air and ocean temperatures, wind patterns, storms, and precipitation. Climate change is forecasted to result in increasingly serious effects to human health and safety and the natural environment in coming decades, such as more extreme weather, drought, wildfire, sea level rise effects on flooding and coastal erosion, and impacts on air quality, water quality and supply, habitats and wildlife, and agriculture.

Substantial evidence identifies accelerated climate change due to emissions of carbon dioxide and other heat trapping greenhouse gases (GHGs) from human activities. GHGs include carbon dioxide, methane, and nitrous oxide, as well as other smaller contributions from hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GHG emissions are typically measured in metric tons (MT) of carbon dioxide equivalents (CO<sub>2</sub>e) based on global warming potential, which allows for totaling the emissions. Natural processes emit GHGs to regulate the earth's temperature; however, substantial increases in emissions, particularly from fossil fuel combustion for electricity production and vehicle use, have substantially elevated the concentration of these gases in the atmosphere well beyond naturally occurring concentrations.

CO<sub>2</sub> accounts for 83 percent of GHG emissions within the United States as of 2019. California is a substantial contributor of GHGs, with transportation and industrial uses representing the largest sources (41 and 24 percent, respectively). In Santa Barbara, direct sources of GHG emissions are on-road vehicles, natural gas consumption, and off-road vehicles and equipment. Indirect sources (emissions removed in location or time) are electricity consumption (power generation), landfill decomposition (methane releases), and State Water Project transport (electricity use).

California Assembly Bill 32 ([AB 32] 2006 Global Warming Solutions Act) set a target to reduce statewide GHG emissions to 1990 levels by the year 2020. Senate Bill 375 ([SB 375] 2008 Sustainable Communities and Climate Protection Act) requires regional coordination of transportation and land use planning throughout the State to reduce vehicle GHG emissions. CARB established targets for Santa Barbara County to not exceed 2005 per capita vehicle emissions in the years 2020 and 2035.

The City updated its Climate Action Plan (CAP) in July 2024. The CAP update establishes a goal of achieving a 40 percent reduction in per capita GHG emissions compared to 1990 levels by 2030 (consistent with California Senate Bill [SB] 32) and a goal of achieving carbon neutrality by 2035 (ten years sooner than Assembly Bill [AB] 1279 goal of carbon neutrality by 2045).

**Impact Evaluation Guidelines:** CEQA Guidelines Section 15183.5 establishes a framework for developing a qualified GHG emissions reduction plan to cumulatively reduce GHG emissions and allow CEQA lead agencies to analyze and mitigate the effects of plan- and project-level GHG emissions. The City's 2024 CAP was designed to be consistent with CEQA Guidelines Section 15183.5, includes targets that are consistent with or exceed state goals and an Initial Study/Negative Declaration (IS/ND) has been adopted by City Council.

Projects that are substantially consistent with the underlying demographic projections (i.e., residents and employees) and land use assumptions used in the CAP will be able to tier from the adopted IS/ND where appropriate under CEQA. The CAP relied on the Santa Barbara County Association of Governments (SBCAG) Connected 2050 projections and the land use assumptions for existing uses and densities allowed by land use designations in the City of Santa Barbara General Plan, any associated amendments current as of 2023, and the 2023-2031 Housing Element. In addition, the assumptions account for the maximum buildout allowed by existing zoning districts, zoning overlays, and SBMC ordinances that increase density on top of the baseline density. To streamline the CEQA GHG emissions analysis process, the City has prepared a CEQA GHG Checklist, included in the City's Master Environmental Assessment (MEA) Guidelines for Greenhouse Gas Emissions Analysis, that can be used in environmental review documents to confirm a project is consistent with the CAP emissions reduction strategy.

For projects that exceed the CAP update's demographic projections and assumptions based on existing land use designations and existing maximum densities allowed by zoning, including zoning ordinances as of 2023 related to housing overlays, multi-unit housing, and accessory dwelling units, a different methodology and assessment utilizing quantitative thresholds of significance would be necessary to evaluate GHG emissions impacts. The City's MEA Guidelines for Greenhouse Gas Emissions Analysis includes guidance on how to utilize quantitative thresholds that were developed for purposes of evaluating the level of significance of GHG emissions impacts and how to quantify a project's GHG emissions for comparison to the applicable threshold of significance.

## Existing Conditions and Project Impacts

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### 8.a-b) Greenhouse Gases

**Potentially Significant Impact.** Sources of direct carbon dioxide and other GHG emissions that could result from the project include construction emissions, project-related traffic, and landscaping/maintenance equipment. Indirect emissions are associated with power generation for electricity consumption. The Project may result in the generation of GHGs that have a significant impact on the environment and conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. These impacts would be potentially significant and will be analyzed in detail in the EIR.

## Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

## 9. Hazards and Hazardous Materials

| 9. HAZARDS AND HAZARDOUS MATERIALS                                                                                                                                                                                        | Level of Significance   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                                        |                         |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?                                                                                   | Less than Significant   |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?                           | Potentially Significant |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?                                                           | Less than Significant   |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?  | No Impact               |
| e) For a project located within the SBCAG Airport Land Use Compatibility Plan, Airport Influence Area, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | No Impact               |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?                                                                                                 | Less than Significant   |
| g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?                                                                                   | No Impact               |

### Discussion

**Issues:** Hazardous materials issues involve the potential for public health or safety impacts from exposure of persons or the environment to hazardous materials or risk of accidents involving combustible or toxic substances. Hazards issues include the exposure of people or structures to airport hazards, wildland fires, or other types of hazards.

**Impact Evaluation Guidelines:** Significant impacts may result from the following:

1. Siting of incompatible projects in close proximity to existing sources of safety risk, such as pipelines, industrial processes, railroads, airports, etc.
2. Exposure of project occupants or construction workers to unremediated soil or groundwater contamination.
3. Exposure of persons or the environment to hazardous substances due to the improper use, storage, transportation, or disposal of hazardous materials.
4. Physical interference with an emergency evacuation or response plan.
5. Expose people or structures to risk of loss, injury or death involving wildland fires.

Emergency access is also discussed in Transportation (Section 17). Toxic air contaminants are also discussed in Air Quality (Section 3). Wildland fire hazards are also discussed in Wildfire (Section 20).

## Existing Conditions and Project Impacts

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### 9.a) Public Health and Safety

**Less than Significant Impact.** Construction of the Project would likely involve the use of some hazardous materials, such as vehicle fuels, lubricants, greases, and transmission fluids in construction equipment, and paints, coatings, and adhesives in building construction. Operation of the Project includes limited storage and use of hazardous materials, including diesel within an aboveground fuel tank and materials required for the hypochlorite disinfection system. However, these products would only be used and stored in limited quantities, are generally consistent with existing conditions, and the normal routine use of these products would not result in a significant hazard to residents or workers in the vicinity of the Project site. In addition, operation of the proposed water infrastructure would not result in the production of hazardous waste.

The transport, use, and disposal of hazardous materials used or removed during proposed Project construction and operation would be conducted in compliance with applicable federal, State, and local laws pertaining to the safe handling, transport, and disposal of hazardous materials. This includes the Federal Resource Conservation and Recovery Act (RCRA), which includes requirements for hazardous solid waste management; and the California Department of Toxic Substances Control (DTSC) Environmental Health Standards for the Management of Hazardous Waste (CCR Title 22, Division 4.5), which includes standards for generators and transporters of hazardous waste. Therefore, the Project would result in less than significant impacts related to the routine transport, use, or disposal of hazardous materials and the potential release of hazardous materials into the environment.

### 9.b) Upset or Accidental Release

**Potentially Significant.** Improper use, storage, transportation, and disposal of hazardous materials and waste during construction could result in accidental spills or releases, posing health risks to workers, the public, and the environment. To minimize these risks, the Project would implement a Stormwater Pollution Prevention Plan (SWPPP) under the National Pollutant Discharge Elimination System (NPDES) General Construction Permit, enforced by the Central Coast Regional Water Quality Control Board. The SWPPP would include best management practices (BMPs) for hazardous materials containment, spill response, and site stabilization.

Construction would also involve the demolition and removal of existing structures that may contain asbestos and/or lead-based paint. If present, the Project Contractor(s) would comply with California Occupational Safety and Health Administration (CalOSHA) regulations, specifically CCR Section 1532.1, which requires testing, monitoring, containment, and disposal of lead-based materials to ensure exposure levels remain below CalOSHA thresholds.

An Environmental Site Investigation conducted in 2023 included sampling for lead, lead-based paint, and asbestos. No soil discoloration or odors were observed, and all detected lead concentrations were below applicable Environmental Screening Levels (ESLs) and within background ranges. No lead, lead-based paint, and asbestos concerns were identified (Appendix B).

The Project also includes re-abandonment of a previously abandoned oil well located beneath the northeast corner of the existing reservoir. Because the well's casing elevation is unknown, locating and capping the well below the new reservoir floor could disturb soil that may contain oil contamination from

the original drilling and construction. This activity presents a potential for accidental release of subsurface contaminants.

Due to the potential for hazardous materials exposure during oil well re-abandonment and structure demolition, impacts are considered potentially significant. This impact will be analyzed in detail in the EIR.

### 9.c) Schools

**Less than Significant Impact.** The nearest school to the Project site is Washington Elementary School, located approximately 0.23 miles south of the proposed Vic Trace Outlet Main on Meigs Road. Construction activities would involve the use of diesel fuel, gasoline, motor oil, and similar materials in typical quantities for a project of this scale. These materials would be handled in accordance with applicable regulations, including OSHA Standard 1917.156, which governs fueling locations, liquid fuel handling, and storage practices. Construction personnel would be trained and/or certified to operate equipment safely, minimizing the risk of accidental release.

Operational activities at the Vic Trace Reservoir parcel would occur approximately 0.45 miles from Washington Elementary School and would not involve hazardous materials handling near the school. The Vic Trace Outlet Main would consist of buried water infrastructure and would not require routine maintenance.

Therefore, the Project would have a less than significant impact related to hazards affecting schools.

### 9.d) Contaminated Sites

**No Impact.** Government Code Section 65962.5 requires the California Environmental Protection Agency (EPA) to develop an updated Hazardous Waste and Substances Sites List, also known as the Cortese List. The DTSC is responsible for a portion of the information contained in the Cortese List; other state and local government agencies are also required to provide additional hazardous material release information for the Cortese List. The analysis for this section included a review of the following resources on July 23, 2025, to provide hazardous material release information:

- State Water Resources Control Board (SWRCB) GeoTracker database (SWRCB 2025)
- DTSC EnviroStor database (DTSC 2025)
- California Environmental Protection Agency Cortese List Data Resources (EPA 2025)

Based upon review of these databases, there are no hazardous material sites mapped at, adjacent to, or within 1,000 feet of the Project site. Therefore, the project would not be located on a site included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5. No impact would occur.

### 9.e) Airport Hazards

**No Impact.** The Project site is not located within the Santa Barbara County Association of Governments' Airport Land Use Compatibility Plan, Airport Influence Area for the Santa Barbara Airport (Santa Barbara County Association of Governments 2023). Therefore, the Project would have no impact related to airport safety hazards or noise for people residing or working in the Project area.

### 9.f) Emergency Evacuation and Response

**Less than Significant Impact.** The Project site is located within a developed residential area subject to wildfire evacuation planning and coastal hazard preparedness. The Project includes both on-site improvements at the Vic Trace Reservoir parcel and off-site improvements within public ROW, including La Coronilla Drive, Dolores Drive, Meigs Road, Ricardo Avenue, and La Vista Del Oceano Drive.

The City's 2021 Community Wildfire Protection Plan identifies Wildfire Evacuation Preplanning Blocks, and the Project site is within STB 14, a residential block that relies on Meigs Road and Cliff Drive as primary evacuation routes (City of Santa Barbara 2021b). The Tsunami Response Plan does not identify the Project site, including the off-site improvement areas, as being within a tsunami inundation zone (City of Santa Barbara 2012).

Temporary construction activities, including trenching for pipeline replacement and PRV station relocation, would occur within public roadways. These activities would be phased and managed with traffic control measures, including signage and flaggers, to maintain access for emergency vehicles and residents. See *Traffic Controls* section of the *Project Description* for a full discussion of proposed traffic controls. Construction staging and worker parking would occur entirely on-site at the Vic Trace Reservoir parcel, minimizing disruption to public streets. The Project would not result in permanent road closures or reconfigurations that would obstruct emergency access and would not generate substantial new vehicle trips during operation that could interfere with emergency access. Therefore, the Project would have a less than significant impact involving interference with emergency response plans and emergency evacuation plans.

#### **9.g) Wildland Fire**

**No Impact.** The Project site is not located within a State Responsibility Area or within a Fire Hazard Severity Zone, as designated by the California Department of Forestry and Fire Protection (CalFIRE) (CalFIRE 2025). However, the Project site is located within a Fire Hazard Area Zone as identified by the City's Community Wildfire Protection Plan (City of Santa Barbara 2021b).

Project construction would involve the use of heavy equipment and machinery, which could pose fire risks. However, the Project would comply with regulations related to fire hazards and wildfire safety, including mandatory use of spark arrestors (PRC Section 4442), maintenance of fire suppression equipment during the highest fire danger period (PRC Section 4428), and adherence to standards for conducting construction activities on days when a burning permit is required (PRC Sections 4427 and 4431). Compliance with these regulatory requirements would minimize fire risk during construction. During operation, the proposed project's landscaping would meet the High Fire Hazard Area Defensible Space Requirements from the Community Wildfire Protection Plan, in accordance with Condition of Approval HAZ-2. Therefore, the Project would not increase fire risks at the Project site, and no impact involving wildfire would occur.

#### **Mitigation Measures**

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No mitigation is required.

## 10. Hydrology and Water Quality

| 10. HYDROLOGY AND WATER QUALITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Level of Significance |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                       |
| a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade groundwater quality?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Less than Significant |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Less than Significant |
| c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: <ul style="list-style-type: none"> <li>i. result in a substantial erosion or siltation on- or off-site;</li> <li>ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site</li> <li>iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or</li> <li>iv. impede or redirect flood flows?</li> </ul> | Less than Significant |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No Impact             |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | No Impact             |

### Discussion

**Issues:** Water resources issues include changes in surface drainage, creeks, surface water quality, groundwater quantity and quality, flooding, and inundation.

The City's Storm Water Management Program (SWMP) implements the Federal Clean Water Act's NPDES Phase II regulations and is overseen by the State Water Resources Control Board and the Central Coast Regional Water Quality Control Board (RWQCB). The SWMP is implemented through City ordinance provisions (SBMC Section 22.87). The purpose of the SWMP is to implement and enforce a program designed to reduce the discharge of pollutants to the "maximum extent practicable" to protect water quality. The SWMP addresses discharge of pollutants both during construction and after construction.

The City's floodplain management regulations (SBMC Section 22.24) regulate development in identified areas of the City prone to flood, mudslide/mudflow, or flood related erosion. The purpose of the regulations is to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions and to ensure that the owners of buildings within a FEMA Special Flood Hazard Area can obtain flood insurance.

**Impact Evaluation Guidelines:** A significant impact would result from:

1. Substantial discharge of sediment or pollutants into surface water or groundwater, or otherwise degrading water quality, including temperature, dissolved oxygen, or turbidity.
2. Substantially changing the amount of surface water in any water body or the quantity of groundwater recharge.
3. Substantially changing the drainage pattern or creating a substantially increased amount or rate of surface water runoff that would exceed the capacity of existing or planned drainage and storm water systems.
4. Altering drainage patterns or affecting creeks in a way that would cause substantial erosion, siltation, on- or off-site flooding, or impacts to sensitive biological resources. See also Biological Resources (Section 4).
5. Locating development within floodway or 100-year flood hazard area; substantially altering the course or flow of flood waters or otherwise exacerbating flood hazard to persons or property.

## Existing Conditions and Project Impacts

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### 10.a) Water Quality

**Less than Significant Impact.** Excavation, grading, and other activities associated with construction of the Project would result in soil disturbance which could cause water quality violations through potential erosion and subsequent sedimentation of receiving water bodies. Indirect impacts from construction materials stored onsite, such as stockpiled materials, construction equipment, and trash, could adversely affect water quality.

The Project would be subject to the NPDES Construction General Permit and would require preparation and implementation of a SWPPP. The SWPPP would include best management practices (BMPs) to control erosion, sedimentation, and pollutant discharge. Additionally, the Project would comply with the City of Santa Barbara's Storm Water BMP Technical Guidance Manual and meet Tier 4 post-construction requirements, which apply to projects that disturb more than one acre of land or create significant new impervious surfaces.

Stormwater would be managed through infiltration-based BMPs, including vegetated swales, permeable surfaces, and stormwater storage areas designed to would slow, filter, and infiltrate runoff, reducing the potential for off-site discharge and protecting downstream water quality. The Project would not involve the use of septic systems, nor would it include groundwater extraction that could mobilize existing contamination. The Project site is not located within a designated groundwater recharge area, and the proposed reservoirs would be buried and sealed, which would minimize the potential for leaching or infiltration of contaminants.

Therefore, with adherence to existing regulatory requirements, the Project would not violate water quality standards, violate waste discharge requirements, or substantially degrade surface or groundwater quality. Impacts would be less than significant.

### 10.b) Groundwater Recharge

**Less than Significant Impact.** The Project would not involve the installation of groundwater wells or the extraction of groundwater for construction or operation. The Project site is located in an area underlain by bedrock and not identified as a significant groundwater recharge zone. The City primarily relies on

surface water sources and imported water, and the Project would not alter the City's water supply portfolio or increase groundwater demand.

The Project would introduce new impervious surfaces to the Project site, including paved access roads, building pads, and utility vaults. However, these impervious surfaces would be offset through the installation of areas of pervious cover, including vegetated swales and landscaped areas. The Project would also implement Tier 4 stormwater management measures in accordance with the City's Storm Water BMP Technical Guidance Manual, which require infiltration-based design strategies to maintain pre-project runoff volumes and support on-site percolation. Furthermore, the Project would include water storage areas and graded drainage features designed to slow and infiltrate runoff, thereby minimizing any potential reduction in groundwater recharge. Given the absence of groundwater extraction, the limited increase in impervious surface, and the inclusion of infiltration-based stormwater design, the Project would not substantially decrease groundwater supplies or interfere with groundwater recharge. Impacts would be less than significant.

#### 10.c) Drainage, Stormwater Runoff, and Creeks

**Less than Significant Impact.** The Project site, including both the on-site improvements at the Vic Trace Reservoir parcel and off-site improvements within public rights-of-way, is not traversed by creeks, rivers, or other surface waters. Therefore, the Project would not result in the alteration of the course of a stream or river.

The Project would involve grading, excavation, and the addition of impervious surfaces such as paved access roads and building pads. These activities would alter existing drainage patterns on the site. However, the Project includes stormwater capture and conveyance design features to maximize on-site infiltration and reduce the risk of flooding. Furthermore, these additions would not result in substantial erosion or siltation due to the implementation of erosion control measures and stormwater BMPs as required by the City of Santa Barbara's Storm Water BMP Technical Guidance Manual (Tier 4 requirements) and the NPDES Construction General Permit, which requires preparation of a SWPPP and implementation of erosion and sediment control BMPs during construction.

To manage post-construction runoff, the Project would include infiltration-based drainage features, such as vegetated swales, pervious surfaces, and stormwater storage areas. These features are designed to slow, filter, and infiltrate runoff, thereby maintaining pre-project runoff volumes and reducing the risk of flooding on- or off-site. The existing storm drain system along Dolores Drive and La Coronilla Park would continue to receive overflow from the Project site, such that no exceedance of system capacity is anticipated.

The Project would not impede or redirect flood flows. The Project site is not located within a floodplain (Federal Emergency Management Agency 2018), and no structures would be placed in areas subject to inundation. The buried reservoirs and associated infrastructure would be designed to withstand storm events and would not obstruct natural drainage pathways.

Therefore, the Project would not substantially alter drainage patterns in a way that would cause erosion, flooding, or exceedance of stormwater system capacity. Impacts would be less than significant.

#### 10.d) Inundation

**No Impact.** The Project site is not located in a flood hazard zone or in an area prone to regular flooding (Federal Emergency Management Agency 2018) and is not in a tsunami or seiche zone (City of Santa Barbara 2012). The Project would not substantially alter the course or flow of flood waters. Therefore, no impact related to pollutant release during inundation would occur.

## 10.e) Conflict with Applicable Plans

**No Impact.** The Project would be consistent with applicable water quality and groundwater management plans adopted by the City of Santa Barbara and the State of California. The Project would comply with the City of Santa Barbara's SWMP, which implements post-construction stormwater treatment requirements to reduce runoff and prevent pollution. The Project would be subject to Tier 4 of the City's Storm Water BMP Technical Guidance Manual and would include infiltration-based BMPs, such as vegetated swales, pervious surfaces, and stormwater storage areas, to manage runoff and protect water quality.

The Project would also be consistent with the City's Enhanced Urban Water Management Plan (EUWMP), adopted in 2021 as part of the Water Vision Santa Barbara initiative. The EUWMP outlines a long-term strategy for sustainable water supply and infrastructure resilience. The Project directly supports the EUWMP's goals by replacing aging infrastructure to reduce water loss and improve system reliability; enhancing operational flexibility through the construction of two 5 MG reservoirs; improving water quality and system hydraulics; and supporting emergency preparedness and climate resilience.

The Project would not involve groundwater extraction or septic systems.

Therefore, the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. No impact would occur.

## Mitigation Measures

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No mitigation is required.

## 11. Land Use and Planning

| 11. LAND USE AND PLANNING                                                                                                                                                               | Level of Significance        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Would the project:                                                                                                                                                                      |                              |
| a) Physically divide an established community?                                                                                                                                          | No Impact                    |
| b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating and environmental impact? | Less than Significant Impact |

### Discussion

**Issues:** Certain project types have the potential to result in incompatibility with existing surrounding land uses or activities. Typically, development applications for General Plan Amendments, Rezones, Conditional Use Permits, Performance Standard Permits, and certain modifications have the greatest potential to result in land use compatibility issues. Incompatibility can result from a project's generation of noise, odor, safety hazards, traffic, visual effects, or other environmental impacts.

**Impact Evaluation Guidelines:** Significant impacts may result from a project that would create a physical barrier that would substantially impact circulation within an established neighborhood. Significant impacts may result from a project where an inconsistency with the General Plan, SBMC, or Coastal Land Use Plan (if applicable) would result in an adverse environmental effect. The analysis focuses on regulations, standards, and policies that relate to avoiding or mitigating environmental impacts, and includes an assessment of whether any inconsistency with these standards creates a significant physical impact on the environment.

### Existing Conditions and Project Impacts

#### 11.a) Physically Divide a Community

**No Impact.** The Project does not include any new roads, walls, fences, or other physical barriers that could alter existing vehicular or pedestrian circulation patterns or isolate neighborhoods. All off-site improvements, including pipeline replacements and PRV station relocation, would occur underground with limited aboveground standard accessory equipment within existing public ROW and would not result in substantial permanent changes to neighborhood layout or access. Temporary lane closures or detours during construction would be managed with traffic control measures and would not result in long-term disruption to community connectivity. The Project would not introduce any land use changes, zoning conflicts, or new infrastructure that would isolate parts of the community or restrict access between neighborhoods. Therefore, the Project would not physically divide an established community, and no impact would occur.

#### 11.b) Conflict with a Plan or Policy that would Avoid or Mitigate an Environmental Impact

**Less than Significant Impact.** The Project would not require a General Plan Amendment or rezoning. The Vic Trace Reservoir parcel, not including the portion containing La Coronilla Park, is designated Institutional in the City of Santa Barbara General Plan and zoned RS-15 (Residential Single Unit, 15,000 sq. ft. minimum). The portion of the Vic Trace Reservoir parcel containing La Coronilla Park is designated Parks and Open Space and zoned P-R (Park and Recreation). Off-site improvements are

located within existing public ROW in residential zones (RS-15 and RS-7.5). The proposed utility infrastructure is consistent with these land use designations and zoning regulations. The Project would not introduce new land uses or create land use incompatibilities that could result in environmental impacts. All improvements are related to public water infrastructure and are compatible with surrounding residential and parks and open space uses.

The following provides an initial discussion of potential project consistency or inconsistency with applicable plans and policies.

#### City of Santa Barbara General Plan

The Project is consistent with the following City of Santa Barbara General Plan policies that are intended to avoid or mitigate environmental impacts:

- **ER1.1 (Resource Protection):** Protect and enhance natural resources, including water quality and biological resources.
- **PS6 (Water Supply and Infrastructure):** Maintain and improve water infrastructure to ensure reliable service and emergency preparedness.
- **ER2.2 (Storm Water Management):** Require the use of best management practices (BMPs) to reduce stormwater runoff and protect water quality.
- **ER4.1 (Air Quality and GHG Reduction):** Support infrastructure upgrades that reduce emissions and improve system efficiency.
- **OP1.1 (Public Facilities):** Ensure that public facilities are maintained and upgraded to meet community needs.

#### City of Santa Barbara Coastal Land Use Plan

As shown in Figure 12, the Project site is not located within the Coastal Zone. The Project would not conflict with Coastal Land Use Plan policies related to public access, scenic resources, or coastal hazards. No coastal development permit would be required.

#### Ordinance Provisions

The Project would comply with applicable SBMC provisions for development, including zoning requirements, development permitting procedures, grading, building, and landscape design, lighting, energy efficiency, provision of public improvements and utilities, construction provisions, storm water management, fire code provisions, and noise ordinance. The Project would be consistent with the RS-15 zoning and Institutional land use designation for the Vic Trace Reservoir parcel, and with P-R zoning and Parks and Open Space designation for La Coronilla Park.

In summary, the Project would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental impacts. Therefore, impacts would be less than significant.

#### Mitigation Measures

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No mitigation is required.

## 12. Mineral Resources

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| 12. MINERAL RESOURCES                                                                                                                                                  | Level of Significance |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                     |                       |
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?                                 | No Impact             |
| b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | No Impact             |

### Discussion

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**Issues:** A mineral is a naturally occurring chemical element or compound formed from inorganic processes (not biological in origin). Minerals include metals, rock, sand, petroleum products, and geothermal resources. The City has no active aggregate operations within its jurisdiction, and no quarry or mine operations are pending reactivation or initiation.

**Impact Evaluation Guidelines:** A significant impact could occur from projects that result in the loss of known mineral resources, or loss of mineral resource recovery sites including quarries and petroleum extraction sites.

### Existing Conditions and Project Impacts

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#### 12.a-b) Loss of Known Mineral Resource or Mineral Resource Recovery Site

**No Impact.** The Project site is located within a highly urbanized area and is currently used for municipal water infrastructure. It does not contain any active mineral extraction operations, quarries, or aggregate resource areas. However, the site includes a previously abandoned oil well located beneath the northeast corner of the existing Vic Trace Reservoir. The well was drilled in 1935, was abandoned in 1935, and is no longer in use.

As part of the Project, the oil well would be re-abandoned to current standards under the oversight of the California Department of Conservation, Geologic Energy Management Division (CalGEM). This activity would ensure the well remains permanently offline and does not interfere with current or future land uses.

The Project would not result in the loss of access to a known mineral resource or a mineral resource recovery site. No active or protected mineral resources are present, and the site is not designated for petroleum extraction or mineral recovery in the City's General Plan. Therefore, no impact would occur.

### Mitigation Measures

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No mitigation is required.

## 13. Noise

| 13. NOISE                                                                                                                                                                                                                                         | Level of Significance   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project result in:                                                                                                                                                                                                                      |                         |
| 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? | Potentially Significant |
| b) Generation of excessive groundborne vibration or groundborne noise levels?                                                                                                                                                                     | Potentially Significant |
| c) For a project located within the vicinity of a private airstrip or the SBCAG Airport Land Use Plan/Airport Influence Area, would the project expose people residing or working in the project area to excessive noise levels?                  | No Impact               |

### Discussion

**Issues:** Noise issues are associated with siting of a noise-generating land use next to existing noise-sensitive land uses, and/or short-term construction-related noise. Similarly construction techniques such as pile driving and blasting and land uses such as the railroad can present issues of groundborne vibration. If groundborne vibration is excessive, it can impact the integrity of structures and can affect sensitive land uses.

The primary source of ambient noise in the City is vehicle traffic noise. The City Master Environmental Assessment (MEA) Noise Contour Map identifies average ambient noise levels within the City.

Ambient noise levels are determined as averaged 24-hour weighted levels, using the Day-Night Noise Level ( $L_{dn}$ ) or Community Noise Equivalence Level (CNEL) measurement scales. The  $L_{dn}$  averages the varying sound levels occurring over the 24-hour day and gives a 10 decibel penalty to noises occurring between the hours of 10:00 p.m. and 7:00 a.m. to take into account the greater annoyance of intrusive noise levels during nighttime hours. Since  $L_{dn}$  is a 24-hour average noise level, an area could have sporadic loud noise levels above 60 dBA which average out over the 24-hour period. CNEL is similar to  $L_{dn}$  but includes a separate 5 dB(A) penalty for noise occurring between the hours of 7:00 p.m. and 10:00 p.m. CNEL and  $L_{dn}$  values usually agree with one another within 1 dB(A). The Equivalent Noise Level ( $L_{eq}$ ) is a single noise level, which, if held constant during the measurement time period, would represent the same total energy as a fluctuating noise level.  $L_{eq}$  values are commonly expressed for periods of one hour, but longer or shorter time periods may be specified. In general, a change in noise level of less than three decibels is not audible. A doubling of the distance from a noise source will generally equate to a change in decibel level of six decibels.

Guidance for appropriate long-term background noise levels for various land uses are established in the City General Plan Environmental Resources Element Land Use Compatibility Guidelines. Building codes also establish maximum average ambient noise levels for the interiors of structures.

High construction noise levels occur with the use of heavy equipment such as pile drivers, scrapers, rollers, graders, trenchers and large trucks for demolition, grading, and construction. Equipment noise levels can vary substantially through a construction period, and depend on the type of equipment, number of pieces operating, and equipment maintenance. Construction equipment may generate noise levels of more than 80 or 90 dBA at a distance of 50 feet, and the shorter impulsive noises from other construction

equipment (such as pile drivers and drills) can be even higher, up to and exceeding 100 dBA at a distance of 50 feet. Noise during construction is generally intermittent and sporadic, and after completion of the initial demolition, grading and site preparation activities, tends to be quieter.

The Noise Ordinance (SBMC Section 9.16) governs short-term or periodic noise, such as construction noise, operation of motorized equipment or amplified sound, or other sources of nuisance noise. The ordinance establishes limitations on hours of construction and motorized equipment operations, and provides criteria for defining nuisance noise in general.

Aircraft traffic also creates intermittent higher noise levels and is a major source for noise in the communities surrounding the Santa Barbara Airport. The Airport is located outside of the continuous boundary of the City, and areas affected by aircraft noise include several neighborhoods within the City of Goleta, UCSB, and unincorporated areas of the County. The Santa Barbara Airport's Noise Compatibility Program and the Airport Land Use Plan provide noise abatement procedures and policies for the airport to minimize noise; guidelines for placement of noise sensitive land uses near the airport, and mitigation measures to prevent impacts to residential areas from airport noise.

**Impact Evaluation Guidelines:** A significant noise impact may result from:

#### Project Noise Generation

Substantial noise and/or vibration from project operations (such as stationary mechanical equipment) or grading and construction activities (such as the use of pile drivers) in close proximity to noise-sensitive receptors for an extensive duration. Exposure to noise levels of 100 dBA for longer than 15 minutes, or 85 dBA for more than 8 hours, has the potential to result in harmful health effects. A vibration study is required for projects that will use pile drivers.

#### Ambient Noise Levels

Siting of a project such that persons would be subject to long-term ambient noise levels in excess of the Noise Element land use compatibility guidelines as follows. The guidelines include maximum interior and exterior noise levels.

1. Interior noise levels are of primary importance for residences due to the health concerns associated with continued exposure to high interior noises. Projects not meeting interior noise levels would have significant noise impacts.
2. For exterior noise levels, there are two levels of noise:
  - a. "Clearly unacceptable" exterior levels are those levels above which it would be prohibitive, even with mitigation, to achieve the maximum interior noise levels, and the outdoor environment would be intolerable for the assigned use. Projects exceeding the maximum "clearly unacceptable" noise levels would have significant noise impacts.
  - b. "Normally unacceptable" noise levels are those levels which it is clear that with standard construction techniques maximum interior noise levels will be met and there will be little interference with the land use. Projects below the maximum "normally unacceptable" noise levels would have less than significant noise impacts.
  - c. Projects with exterior noise levels exceeding the "normally acceptable" level and below the maximum "clearly unacceptable" level are evaluated on a case by case basis to identify mitigation to achieve the "normally acceptable" exterior levels to the extent feasible and to determine the level of significance of the noise exposure.

The following are the maximum interior and exterior noise levels for common land uses in the City:

- Commercial (retail, restaurant, etc.) and Office (personal, business, professional): Normally acceptable maximum exterior ambient noise level of 75 dBA L<sub>dn</sub>; clearly unacceptable maximum exterior noise level of 80 dBA L<sub>dn</sub>; maximum interior noise level of 50 dBA L<sub>dn</sub>.
- Residential: Normally acceptable maximum exterior ambient noise level of 60 dBA L<sub>dn</sub> in single family zones and 65 dBA L<sub>dn</sub> in non-residential or multi-family residential zones); clearly unacceptable maximum exterior noise level of 75 dBA L<sub>dn</sub>; maximum interior noise level of 45 dBA L<sub>dn</sub>.

### Aircraft Noise

3. Project site location near the Airport that would result in excessive noise exposure for project residents or employees.

## Existing Conditions and Project Impacts

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### **13.a-b) Increased Noise and Vibration Levels**

**Potentially Significant Impact.** Construction of the Project would generate temporary increases in noise and vibration from excavation, demolition, reservoir construction, pipeline installation, and other construction activities. Nearby noise sensitive receptors include single-family residences surrounding the Vic Trace Reservoir parcel and along La Coronilla Drive, Dolores Drive, Meigs Road, Ricardo Avenue, and La Vista Del Oceano Drive.

Noise levels may exceed applicable thresholds during certain phases of construction, and vibration from equipment such as compactors or jackhammers could affect nearby structures. Therefore, impacts associated with construction of the Project may be potentially significant. These impacts will be analyzed in detail in the EIR.

Once construction is completed, Project maintenance activities are anticipated to generate similar noise levels as existing conditions. Operational noise impacts would be less than significant.

### **13.c) Aircraft Noise**

**No Impact.** The Project site is not located within the vicinity of the Santa Barbara Airport nor any private airstrip. No impact would occur.

## Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

## 14. Population and Housing

| 14. POPULATION AND HOUSING                                                                                                                                                                                          | Level of Significance |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                                                                  |                       |
| a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | Less than Significant |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?                                                                                     | No Impact             |

### Discussion

**Issues:** Population and housing issues include induced population growth that would strain environmental resources within the City or require new infrastructure or development, the construction of which could result in environmental impacts. The loss of housing units would displace populations and increase demand for housing within the City.

**Impact Evaluation Guidelines:** A potentially significant population and housing impact may occur if:

1. Growth inducement, such as provision of substantial population or employment growth or creation of substantial housing demand; development in an undeveloped area, or extension/expansion of major infrastructure that could support additional future growth.
2. Loss of a substantial number of people or housing units, especially loss of lower cost housing.

### Existing Conditions and Project Impacts

#### 14.a) Growth Inducing Impacts

**Less Than Significant Impact.** The Project would not extend major public infrastructure such as water, sewer, or roads in a manner that would facilitate new development. It would not result in substantial employment growth or increase demand for housing. The Project site is located in an urbanized area already served by existing infrastructure. Therefore, the Project would not induce unplanned growth, and impacts would be less than significant.

#### 14.b) Housing Displacement

**No Impact.** The Project does not include any existing residential uses and would not displace any people or housing. Therefore, no impact related to displacement would occur.

### Mitigation Measures

No mitigation is required.

## 15. Public Services

| 15. PUBLIC SERVICES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Level of Significance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Would the project:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                       |
| a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: <ul style="list-style-type: none"> <li>i. Fire protection?</li> <li>ii. Police protection?</li> <li>iii. Schools?</li> <li>iv. Parks?</li> <li>v. Other public facilities?</li> </ul> | Less than Significant |

### Discussion

**Issues:** This section evaluates project effects on fire and police protection services, schools, and other public facilities.

**Facilities and Services:** The General Plan EIR concluded that under existing conditions as well as the projected planned development and all studied alternatives, all public services (police, fire, library, public facilities, governmental facilities, electrical power, natural gas and communications) could accommodate the potential additional growth until 2030. The General Plan EIR also determined that growth in the City under the General Plan would not result in a considerable contribution to cumulative impacts on public services on the South Coast.

**Schools:** None of the school districts in the South Coast have been designated "overcrowded" as defined by California State law. Per California Government Code Section 66000, the City collects development impact fees from new development to offset the cost of providing school services/additional infrastructure to accommodate new students generated by the development.

**Impact Evaluation Guidelines:** The following may be identified as significant public services and facilities impacts:

1. Creation of a substantial need for increased police department, fire department, public facility maintenance, or government services staff or equipment.
2. Generation of substantial numbers of students exceeding public school capacity where schools have been designated as overcrowded.

### Existing Conditions and Project Impacts

#### 15.a) Fire, Police, Schools, and Other Public Facilities

**Less Than Significant Impact.** The Project site is located in an urbanized area where all public services are available. The Project is not anticipated to create a substantially different demand on fire or police protection services, library services, or City buildings and facilities than that anticipated in the General Plan EIR.

The Project site location is served by the Santa Barbara Unified School District for elementary and high school, which is not designated as overcrowded as defined by the State of California. The certified General Plan EIR found no significant impacts to police, schools, and public facilities for growth projected for the City in the 2030 timeframe. Therefore, impacts to fire protection, police protection, schools, library services, City buildings and facilities are anticipated to be less than significant.

## **Mitigation Measures**

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No mitigation is required.

## 16. Recreation

| 16. RECREATION                                                                                                                                                                                                 | Level of Significance |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | Less than Significant |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?                        | Less than Significant |

### Discussion

**Issues:** Recreational issues are associated with increased demand for recreational facilities or loss of or impacts to existing recreational facilities or parks.

**Impact Evaluation Guidelines:** Recreation impacts may be significant if the project would result in:

1. Increase in demand for park and recreation facilities in an area underserved by existing public park and recreation facilities leading to substantial physical deterioration of existing facilities.
2. Substantial loss or interference with existing park space or other public recreational facilities such as hiking, cycling, or horse trails.
3. Substantial adverse physical impacts associated with the construction or expansion of recreational facilities.

### Existing Conditions and Project Impacts

#### 16.a) Existing Recreational Facilities

**Less than Significant Impact.** The Project site includes La Coronilla Park, a City-designated Neighborhood Park, which is located on the north-western portion of the Vic Trace Reservoir parcel and is currently undeveloped and vegetated. The Project does not propose new residential development or population growth that would directly increase demand on recreational facilities. However, temporary construction activities would affect La Coronilla Park, including underground pipeline upgrades beneath the park, temporary construction access through the park, and temporary closure of public access for up to three months. Disturbed areas would be restored to pre-Project conditions following construction.

Temporary construction impacts to La Coronilla Park are not anticipated to increase the use of other recreational facilities such that substantial deterioration would occur or be accelerated. The Project would have less than significant impacts related to existing recreational facilities.

## 16.b) New Recreational Facilities

**Less than Significant Impact.** The Project does not include the construction or expansion of recreational facilities. The Project site includes La Coronilla Park, a designated Neighborhood Park, located on the western portion of the Vic Trace Reservoir parcel. However, the Project does not propose any new recreational amenities or upgrades to La Coronilla Park beyond minor underground pipeline improvements and temporary construction access.

All work within La Coronilla Park would be underground, and disturbed areas would be restored to pre-Project conditions following construction. No new recreational features (e.g., trails, playgrounds, sports fields) are proposed, and no expansion of park boundaries or facilities would occur. As the Project would not involve new recreational infrastructure, it would not result in habitat disturbance beyond temporary vegetation removal (which would be minimized through replating), increased use of sensitive areas, increased vehicle traffic or emissions beyond construction-related activity, or increased noise levels beyond temporary construction noise.

Therefore, while the Project would temporarily affect La Coronilla Park during construction, the Project would not include or require the construction or expansion of recreational facilities that would result in adverse physical effects on the environment. Impacts would be less than significant.

### Mitigation Measures

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No mitigation is required.

## 17. Transportation

| 17. TRANSPORTATION                                                                                                                                               | Level of Significance   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                               |                         |
| a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?         | Potentially Significant |
| b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b) (Criteria for Analyzing Transportation Impacts)?                            | Less than Significant   |
| c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | Less than Significant   |
| d) Result in inadequate emergency access?                                                                                                                        | Less than Significant   |

### Discussion

**Issues:** Transportation issues include vehicle miles traveled (VMT), access, circulation and safety. Vehicle, bicycle and pedestrian, and mass transit modes of transportation are all considered, as well as emergency vehicle access.

The City General Plan Circulation Element contains policies addressing circulation, vehicle traffic, and alternative mode travel in the City. Alternative mode policies are also contained in other adopted City planning documents, including the Nonresidential Growth Management Program, Pedestrian Master Plan, Bicycle Master Plan, Upper State Street Plan, as well as regional transportation plans.

**Impact Evaluation Guidelines:** State legislation Senate Bill (SB) 743 revises the approach for analyzing transportation impacts of projects under CEQA. The legislation identifies the use of VMT or similar approaches as the most appropriate measure for determining transportation impacts, shifting away from the level of service analysis that evaluated a project's impacts on traffic conditions on nearby roadways and intersections. The change to VMT is meant to focus development in urban centers where vehicle trips are shorter or where other modes of transportation are supported to encourage land use and transportation planning decisions that reduce and minimize VMT, which is GHG emissions generator.

The State provides screening criteria to quickly identify projects not expected to result in transportation impacts under the VMT methodology which are summarized in the City's Master Environmental Assessment Guidelines for Transportation Analysis. Consistent with State CEQA Guidelines Section 15064.3, projects in areas that are already well served by a major transit stop are presumed to have less than significant transportation impacts. A major transit stop is defined in the State CEQA Guidelines as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with frequencies of service intervals of 15 minutes or less during the morning and afternoon peak commute periods. Projects located within a high quality transit corridor as identified by SBCAG are presumed to have less than significant VMT impacts. Per the MEA Guidelines (p.3), projects are defined as "small projects" when generating 250 or fewer daily net vehicle trips on an average weekday. Those defined as "small projects" are presumed to have less than significant CEQA transportation impacts. Transit and active transportation projects are also presumed to have a less than significant impact on VMT.

### Circulation and Traffic Safety

1. Create or substantially increase potential hazards due to a roadway that has design features (e.g., narrow width, roadside ditches, sharp curves, poor sight distance, inadequate pavement structure) or that supports uses that would be incompatible with the proposed project.
2. Diminish or reduce effectiveness, adequacy, or safety of pedestrian, bicycle, or public transit circulation.
3. Result in inadequate emergency access on-site or to nearby uses.
4. Conflict with regional and local plans, policies, or ordinances regarding the circulation system, including pedestrian, bicycle, and public transportation.

### Existing Conditions and Project Impacts

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#### **17.a) Bicycle/Roadway/Pedestrian/Public Transit**

**Potentially Significant Impact.** The Project site is located in the Alta Mesa neighborhood of Santa Barbara, characterized as a primarily residential area with multimodal infrastructure. The Project site includes La Coronilla Drive, Dolores Drive, Ricardo Avenue, La Vista Del Oceano, and Meigs Road, all of which are local or collector streets.

Transit service in the vicinity is provided by Santa Barbara Metropolitan Transit District. Line 5 (Mesa/La Cumbre) and Line 4 (Mesa/Santa Barbara City College) operate along Cliff Drive and Meigs Road, with the nearest stops located at Meigs Road and La Coronilla Drive, Meigs Road and Red Rose Way, and Cliff Drive and Meigs Road (Santa Barbara Metropolitan Transit District 2025). These routes provide access to Santa Barbara City College, downtown Santa Barbara, and the La Cumbre area. Pedestrian sidewalks occur along both sides of La Coronilla Drive, Dolores Drive, Ricardo Avenue, La Vista Del Oceano, and Meigs Road. A Class II bicycle facility is located along Meigs Road and occurs within the Project site (City of Santa Barbara 2016).

Project construction activities, including open-cut trenching, pipeline installation, and PRV station construction, would occur within La Coronilla Drive, Dolores Drive, Ricardo Avenue, La Vista Del Oceano, and Meigs Road. These activities would result in temporary lane closures, sidewalk removals, and increased truck traffic. Temporary closures of sidewalks and driveways, as well as detours for pedestrians and cyclists, would occur.

Although all disturbed infrastructure would be restored to pre-Project conditions, these temporary disruptions could substantially affect pedestrian and bicycle access and safety during construction. While the Project would not permanently remove or degrade pedestrian, bicycle, or transit facilities, and would restore all affected infrastructure, the scale and duration of construction activities could result in potentially significant temporary impacts to the circulation system. These impacts will be analyzed in detail in the EIR.

#### **17.b) Vehicle Miles Traveled**

**Less than Significant Impact.** The Project site is not located within a Transit Priority Area or within 0.25 mile of a High Quality Transit Corridor, as identified by SBCAG's Transit GIS Storymap (SBCAG 2025). The surrounding area is primarily low-density residential with limited transit service and no major transit stops or corridors that meet the statutory definitions under Public Resources Code Section 21064.3 or 21155.

Pursuant to the City of Santa Barbara's Master Environmental Assessment Guidelines for Transportation Analysis, the Project qualifies for screening as a small project that generates 250 or fewer daily net vehicle trips on an average weekday (City of Santa Barbara 2023). These types of projects are generally presumed to have a less-than-significant VMT impact because they do not generate substantial new vehicle trips and are not trip-attractive land uses. The Project involves replacement of existing water infrastructure and does not include new residential, commercial, or employment-generating components. Construction-related trips would be temporary and are not considered in the VMT analysis under CEQA Guidelines Section 15064.3(b), which focuses on long-term operational impacts.

Given the project does not introduce new land uses or increase long-term trip generation, and because it meets the MEA screening criteria for utility infrastructure, the Project is presumed to have a less-than-significant impact on VMT.

### 17.c-d) Safety Hazards/Emergency Access

#### Short-Term Construction Access and Circulation

**Less Than Significant Impact.** Standard construction-related conditions of approval would be applied to the Project, including restrictions on the hours permitted for construction trips outside of peak traffic hours, approval of routes for construction traffic, and designation of specific construction staging and parking areas that would not substantially increase hazards during construction or conflict with emergency access to or around the Project site. See *Project Description* for a list of traffic controls and standard conditions related to traffic. Project impacts associated with traffic hazards and emergency access during Project construction would be less than significant.

#### Operational Access and Circulation

**Less than Significant Impact.** The Vic Trace Reservoir parcel is accessed via La Coronilla Drive, a residential street that connects to Dolores Drive and Meigs Road. Existing access to the Vic Trace Reservoir parcel consists of a one-lane, 20-foot-wide paved road that ascends Lavigia Hill to the reservoir. This road currently accommodates limited City maintenance traffic and is not open to the public. As part of the Project, the existing access road would be replaced with a new, 24-foot-wide asphalt concrete road designed to accommodate two-way vehicle traffic, including large maintenance and emergency vehicles. The new road would follow the general alignment of the existing road but would be widened and improved to meet City of Santa Barbara Fire Department standards for emergency access. Additional improvements on the Vic Trace Reservoir parcel include a fire truck turnaround area, terraced staging zones, and a 12-foot-wide perimeter access road surfaced with turf block or similar material to support fire and utility vehicles. Two 30-foot-wide manual wrought iron gates with Knox boxes and security cameras would control access to the site.

The Project would not introduce any new public roadways or intersections and would not alter existing public street geometry in a way that would create sharp curves, blind spots, or other hazardous conditions. No incompatible uses, such as agricultural or industrial equipment, would be introduced to the area. The Project would improve emergency access to the Vic Trace Reservoir parcel and would not introduce hazardous design features or incompatible uses. Impacts related to inadequate emergency access would be less than significant.

### **Mitigation Measures**

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Mitigation may be required and will be discussed in detail in the EIR.

## 18. Tribal Cultural Resources

| 18. TRIBAL CULTURAL RESOURCES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Level of Significance   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |
| <p>a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section §21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with important cultural value to a California Native American tribe, and that is:</p> <ul style="list-style-type: none"> <li>i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code §5020.1.1(k), or</li> <li>ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code §5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code §5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</li> </ul> | Potentially Significant |

### Discussion

**Issues:** Tribal cultural resources are defined in Public Resources Code (PRC) Section 21074.1 and the City's MEA Guidelines for Tribal Cultural Resources as:

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
  - a. Included or determined to be eligible for inclusion in the California Register of Historical Resources; or
  - b. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

The City's MEA Guidelines for Tribal Cultural Resources include an assessment process to help identify, evaluate, and address potential impacts of proposed projects on tribal cultural resources. The assessment is also intended to ensure that tribes are consulted and have the opportunity to protect and manage cultural resources important to the local Chumash community.

**Impact Evaluation Guidelines:** Tribal cultural resource impacts are evaluated based on review of available cultural resource documentation, data gathered from records searches, and consultation with tribal representatives. The traditional knowledge tribal representatives possess enables them to identify places of religious and cultural significance to their tribes, based on traditional knowledge, traditional cultural knowledge or indigenous knowledge, or traditional ecological knowledge, relative to sites, features, places, cultural landscapes, sacred places, and objects with cultural value to the tribe.

If a tribal cultural resource is present or if unknown resources have the potential to exist within a project site, the following significance thresholds from Appendix G of the CEQA Guidelines apply:

1. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value a California Native American tribe, and that is:
  - a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
  - b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

## Existing Conditions and Project Impacts

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### 18.a) Tribal Cultural Resources

**Potentially Significant Impact.** The City has not completed tribal consultation to date. As the Project site is located in an archaeologically sensitive area, there is a potential that Project construction could encounter archaeological resources that qualify as tribal cultural resources. Impacts to potential tribal cultural resources, if encountered during ground-disturbing activities associated with Project construction, would be potentially significant. These impacts will be analyzed in detail in the EIR.

## Mitigation Measures

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Mitigation may be required and will be discussed in detail in the EIR.

## 19. Utilities and Service Systems

| 19. UTILITIES AND SERVICE SYSTEMS                                                                                                                                                                                                                                       | Level of Significance   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Would the project:                                                                                                                                                                                                                                                      |                         |
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects? | Less than Significant   |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?                                                                                                              | Less than Significant   |
| c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?                                     | Less than Significant   |
| d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?                                                                                 | Potentially Significant |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?                                                                                                                                                      | Potentially Significant |

### Discussion

**Issues:** This section evaluates project effects on utilities and service systems, including water and sewer service, storm water drainage, electricity, natural gas, telecommunications, and solid waste disposal.

#### Water

The City of Santa Barbara's water supply comes primarily from the following sources, with the actual share of each determined by availability, level of customer demand, and customer location: Lake Cachuma and Tecolote Tunnel; Gibraltar Reservoir, Devils Canyon and Mission Tunnel; groundwater; State Water Project; desalination; and recycled water. Vic Trace Reservoir receives treated water directly from Cater Water Treatment Plant, which generally treats water supplies from Lake Cachuma, Tecolote Tunnel, Gibraltar Reservoir, Devils Canyon, Mission Tunnel and the State Water Project. Conservation and efficiency improvements are projected to contribute to the supply by offsetting demand that would otherwise have to be supplied by additional sources. The Long Term Water Supply Plan (LTWSP) for the planning period 2020-2050 outlines a strategy to use the above sources to meet the City's projected system demand (potable plus recycled water) of up to 15,160 acre-feet per year (AFY), plus a 10 percent safety margin. The LTWSP concludes that the City's water supply is adequate to meet current and projected demands through at least 2045, even under drought conditions, provided ongoing management and conservation efforts continue.

#### Wastewater

The maximum capacity of the El Estero Water Resource Center (El Estero) is 11 million gallons per day (MGD), with average daily flows of 6 MGD. In 2011, the City certified a citywide Program EIR for the Plan

Santa Barbara General Plan Update. This EIR concluded that the increased wastewater flows to El Estero are enough to accommodate the growth planned through 2030 for the City. The FEIR also concluded that the increased wastewater flows into the City's collection systems would not substantially contribute to current problems of offsite inflow and infiltration of wastewater flows from the City's system.

### Solid Waste

Most of the waste generated in the City is transported on a daily basis to seven landfills located around the County. The County of Santa Barbara, which operates the landfills, has developed impact significance thresholds related to the impacts of development on remaining landfill capacity. These thresholds are utilized by the City to analyze solid waste impacts. The County thresholds are based on the projected average solid waste generation for Santa Barbara County from 1990-2005. The County assumes a 1.2 percent annual increase (approximately 4,000 tons per year) in solid waste generation over the 15-year period. The County's threshold for project specific impacts to the solid waste system is 196 tons per year (this figure represents 5% of the expected average annual increase in solid waste generation [4,000 tons per year]) for project operations. Source reduction, recycling, and composting can reduce a project's waste stream by as much as 50 percent. If a Project generates 196 or more tons per year after reduction and recycling efforts, impacts would be considered significant and unavoidable. Project specific solid waste impact as identified above (196 tons per year or more) would also be considered cumulatively significant, as the project specific threshold of significance is based on a cumulative growth scenario. However, as landfill space is already extremely limited, any increase in solid waste of 1% or more of the expected average annual increase in solid waste generation (4,000 tons per year), which equates to 40 tons per year, is considered adverse significant cumulative impact.

### **Impact Evaluation Guidelines:**

## **Existing Conditions and Project Impacts**

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### **19.a) New or Expanded Utilities**

**Less than Significant Impact.** The Project itself does not create new water demand or require additional system improvements beyond those included in the scope. Therefore, impacts related to new or expanded utilities would be less than significant.

### **19.b) Adequate Water Supplies**

**Less than Significant Impact.** The Project would not result in increased water demand beyond existing conditions. The replacement reservoirs are designed to maintain existing storage capacity and improve operational flexibility. According to the City's Water Distribution Infrastructure Plan, sufficient offsite water storage capacity exists to serve the community during construction and operation, including during normal, dry, and multiple dry years. Therefore, the Project would not adversely affect water supply availability and impacts would be less than significant.

### **19.c) Wastewater Treatment Capacity**

**Less than Significant Impact.** The Project would not result in a substantial increase in wastewater generation. The only new wastewater-producing component would be the restroom facility within the proposed valve building, which would generate minimal sanitary wastewater. This volume would be negligible compared to residential or commercial development and would not strain existing

infrastructure. The City has adequate capacity to serve the Project's projected demand in addition to existing commitments, and impacts would be less than significant.

#### **19.d-e) Solid Waste Capacity and Reduction Goals and Regulations**

**Potentially Significant Impact.** The City of Santa Barbara's solid waste and recycling services are provided by the City's Clean Community Division, in coordination with MarBorg Industries, which operates the South Coast Recycling and Transfer Station. Solid waste generated by the Project (and not recycled on site) would likely be directed to this facility, a privately-operated diversion and recycling station located in Goleta. After sorting and diversion, residual waste would likely be transferred to the Tajiguas Landfill, a Class III landfill operated by the Santa Barbara County Resource Recovery & Waste Management Division.

The Tajiguas Landfill is located approximately 25 miles west of the Project site and accepts a variety of materials, including construction and demolition debris, green waste, and mixed municipal waste. According to the California Department of Resources Recycling and Recovery, the Tajiguas Landfill has a permitted capacity of approximately 29.4 million cubic yards and a maximum daily disposal limit of 9,000 tons. As of 2023, the landfill has sufficient remaining capacity to accommodate regional waste streams, and its estimated closure date is 2038 (California Department of Resources Recycling and Recovery 2025).

Construction activities associated with the Project would generate solid waste, primarily from demolition of the existing reservoir, valve building, and IT/communications building. Estimated debris includes approximately 4,223 tons of concrete and 194 tons of steel, which would be sorted and recycled where feasible. All waste would be disposed of in accordance with applicable federal, State, and local statutes and regulations, including the City's Ordinance No. 6093 and CALGreen requirements for diversion of at least 65 percent of construction waste. However, due to the scale of anticipated construction and demolition debris, the Project would have a potentially significant impact related to short-term solid waste generation. This impact will be analyzed in detail in the EIR.

#### **Mitigation Measures**

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Mitigation may be required and will be discussed in detail in the EIR.

## 20. Wildfire

| 20. WILDFIRE                                                                                                                                                                                                                                                        | Level of Significance |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| If the project is located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:                                                                                                                     |                       |
| a) Substantially impair an adopted emergency response plan or emergency evacuation plan?                                                                                                                                                                            | Less than Significant |
| b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, or thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?                                                         | Less than Significant |
| c) Require the installation or maintenance of associated infrastructure (such as roads, fuel break, emergency water sources, power lines, or other utilities) that may exacerbate fire risks or that may result in temporary or ongoing impacts to the environment? | Less than Significant |
| d) Expose people or structures to significant risks, including downslope or downstream flooding, landslides, or mud flows, as a result of runoff, post-fire slope instability, or drainage changes?                                                                 | Less than Significant |

## Discussion

**Issues:** Wildfire hazards include exposure of persons and structures to wildfire, air pollutants, and post-wildfire slope instability. Structural losses or damage from wildfires often result from inappropriate siting of development within or adjacent high fire hazard areas, the use of inappropriate construction materials or landscaping, and presence of biofuel mass. Recent wildfire events in California indicate that wildfire behavior is changing, and the duration and frequency of wildfire events are increasing. The 2017 Thomas Fire in Santa Barbara and Ventura Counties was the largest wildfire in California history (at the time) and burned over 250,000 acres. This ultimately led to the subsequent debris flow event in January 2018, which gravely impacted the Montecito community.

The California Department of Forestry and Fire Protection (CAL FIRE) defines fire hazard severity zones based on the presence of biofuel mass, climate, topography, assets at risk (high population centers), and an agency's ability to provide fire protection services to an area. The City contains state responsibility lands within the Very High Fire Hazard Severity Zone (VHFHSZ) within the Santa Barbara foothills. In addition, the City has also designated areas within the City as high fire hazard severity zones within the 2021 Community Wildfire Protection Plan (CWPP). The Project is within STB 14, an existing High Fire Hazard Area.

**Impact Evaluation Guidelines:** A significant impact would result from:

1. Siting of development in a very high fire hazard severity zone or beyond adequate emergency response time, with inadequate access, infrastructure, or water pressure, or otherwise in a manner that creates or exacerbates a fire hazard.
2. Impairment or conflict with the Community Wildfire Protection Plan or other emergency response plan.
3. Exposing people or structures to post-fire slope instability, flooding, landslides, mud or debris flows.

## Existing Conditions and Project Impacts

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### 20.a-c) Wildfire Risk Consistency with Existing Emergency and Wildfire Plans and Regulations

**Less than Significant Impact.** The Project site is not located within a State Responsibility Area or within a Fire Hazard Severity Zone (CAL FIRE 2025). However, the Project site is located within a High Fire Hazard Area as identified by the City's Community Wildfire Protection Plan (City of Santa Barbara 2021b).

The Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. Construction activities would occur within a secured, City-owned parcel and adjacent public rights-of-way. The Project would include the construction of a new 24-foot-wide paved access road within the Vic Trace Reservoir parcel that meets City Fire Department standards for emergency vehicle access. The Project would also include surveillance systems and controlled access features that would support emergency coordination. No changes to regional evacuation routes or emergency access corridors would occur, and the Project would be consistent with the City's 2021 Emergency Operations Plan.

Due to the Vic Trace Reservoir parcel's slope, vegetative cover, and exposure to wind, the parcel is inherently susceptible to wildfire. However, the Project would incorporate several design features that reduce wildfire risk. UThe Project would implement a landscaping plan that complies with the City's Fire Department Fuel Modification requirements (SBMC Chapter 8.04), using drought-tolerant and fire-resistant native plants. Furthermore, the proposed project's landscaping would meet the High Fire Hazard Area Defensible Space Requirements from the Community Wildfire Protection Plan, in accordance with Standard Condition of Approval HAZ-1. All new structures, including the valve building and IT/communications building, would be constructed of non-combustible materials such as concrete and metal, and would comply with the California Building Code and Wildland-Urban Interface (WUI) standards. These measures would reduce the potential for the Project to exacerbate wildfire risks, which would reduce pollutant concentrations from wildfire smoke or the uncontrolled spread of fire.

The Project would also include infrastructure improvements that enhance fire safety. The new access road would improve emergency ingress and egress, and the perimeter road and terraced areas would provide fire personnel with access for suppression and maintenance. The replacement reservoir overflow and drain pipeline would connect to the City's storm drain system, helping manage runoff during fire suppression activities. \. No fuel breaks or overhead power lines would be installed.

Therefore, the Project would not impair emergency response or evacuation plans, would not introduce infrastructure that exacerbates fire risk, and would not expose people or structures to significant wildfire-related hazards. Impacts would be less than significant.

### 20.d) Post-Wildfire Slope Instability

**Less than Significant Impact.** The Project site's sloped topography could exacerbate post-fire runoff and erosion. However, the Project includes several design features that reduce these risks, such as terraced grading and retaining walls to stabilize slopes; installation of stormwater BMPs, including vegetated swales and storage areas, to slow and infiltrate runoff; use of pervious surfaces and drainage infrastructure to manage stormwater flow; and compliance with the City's Storm Water BMP Technical Guidance Manual (Tier 4) and Fuel Modification requirements (as adopted in Ordinance No. 6094) to reduce fire intensity and post-fire erosion potential. These measures are consistent with the City's Community Wildfire Protection Plan and Emergency Operations Plan, which emphasize slope stabilization, vegetation management, and resilient infrastructure in high fire hazard areas.

Implementation of these Project design features would minimize impacts related to post-fire flooding, landslides, or mudflows such that impacts would be less than significant.

### **Mitigation Measures**

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No mitigation is required.

## 21. Mandatory Findings of Significance

| 21. MANDATORY FINDINGS OF SIGNIFICANCE                                                                                                                                                                                                                                                                                                                                                                                                                                               | Yes | No |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|
| a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | X   |    |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)                                                                                                                                        | X   |    |
| c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?                                                                                                                                                                                                                                                                                                                                          | X   |    |

### Existing Conditions and Project Impacts

#### 21.a) Biological and Cultural Resources

As discussed in Section 4, *Biological Resources*, the Project would not substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal. As discussed in Section 5, *Cultural Resources*, and Section 18, *Tribal Cultural Resources*, the Project may have potentially significant impacts related to important archaeological or tribal cultural resources. Therefore, these topics have been identified in this Initial Study as having potentially significant impacts and will be further evaluated in the EIR.

#### 21.b) Cumulative Impacts

Sections 1 through 20 of this Initial Study consider potential cumulative impacts to environmental resources. As discussed in these sections, the Project could have a considerable contribution to cumulative impacts to aesthetics, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, noise, transportation, and solid waste. Only these impacts have been identified as possibly contributing to cumulative impacts, and result in significant cumulative impacts on the environment. The potential for cumulative impacts related to these issue areas will be further analyzed in the EIR. For all other issue areas, the Project would have either direct or indirect impacts that have been determined to be less than significant, with standard conditions of approval. The assessment of these impacts did not identify residual impacts, or a contribution to a cumulative impact.

These contributions to potentially significant cumulative impacts will be analyzed in detail in the EIR

### **21.c) Other Environmental Effects**

In general, impacts to human beings are associated with air quality, hazards and hazardous materials, noise, transportation, and wildfire impacts.

As discussed in Sections 1 through 20 of this Initial Study, potentially significant effects on humans (direct or indirect) could occur as a result of this Project. These potentially significant effects, associated with air quality, hazards and hazardous materials, transportation, and noise, will be analyzed in detail in the EIR.

## **Exhibits**

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### **A. Project Plans**

## **Appendices**

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### **A. Engineering Geology and Geotechnical Engineering Report**

### **B. Environmental Site Investigation for the Vic Trace Reservoir Replacement Project**

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The following sources used in the preparation of this Initial Study are located at the Community Development Department, Planning Division, 630 Garden Street, Santa Barbara and are available for review upon request.

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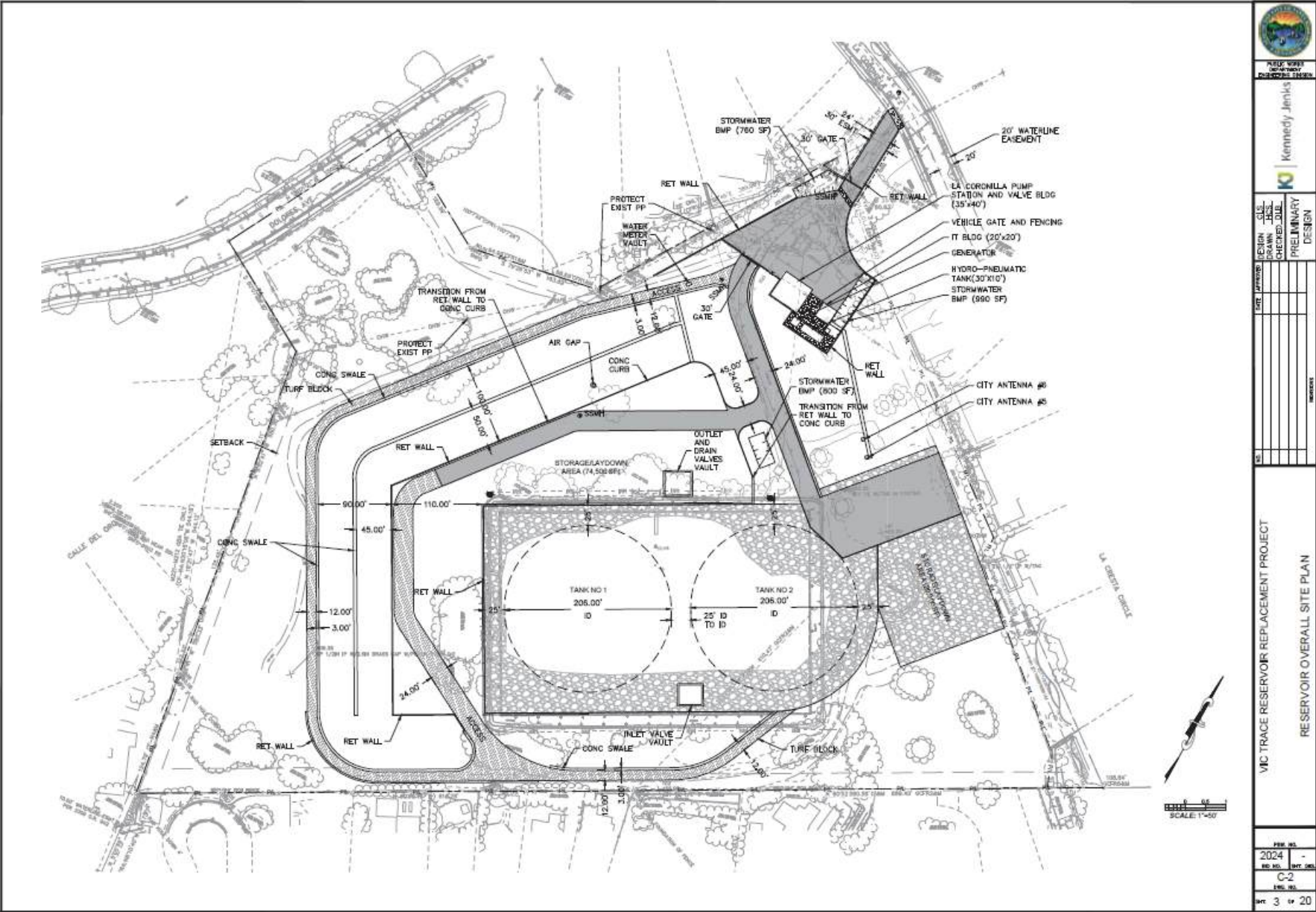
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## Exhibit A

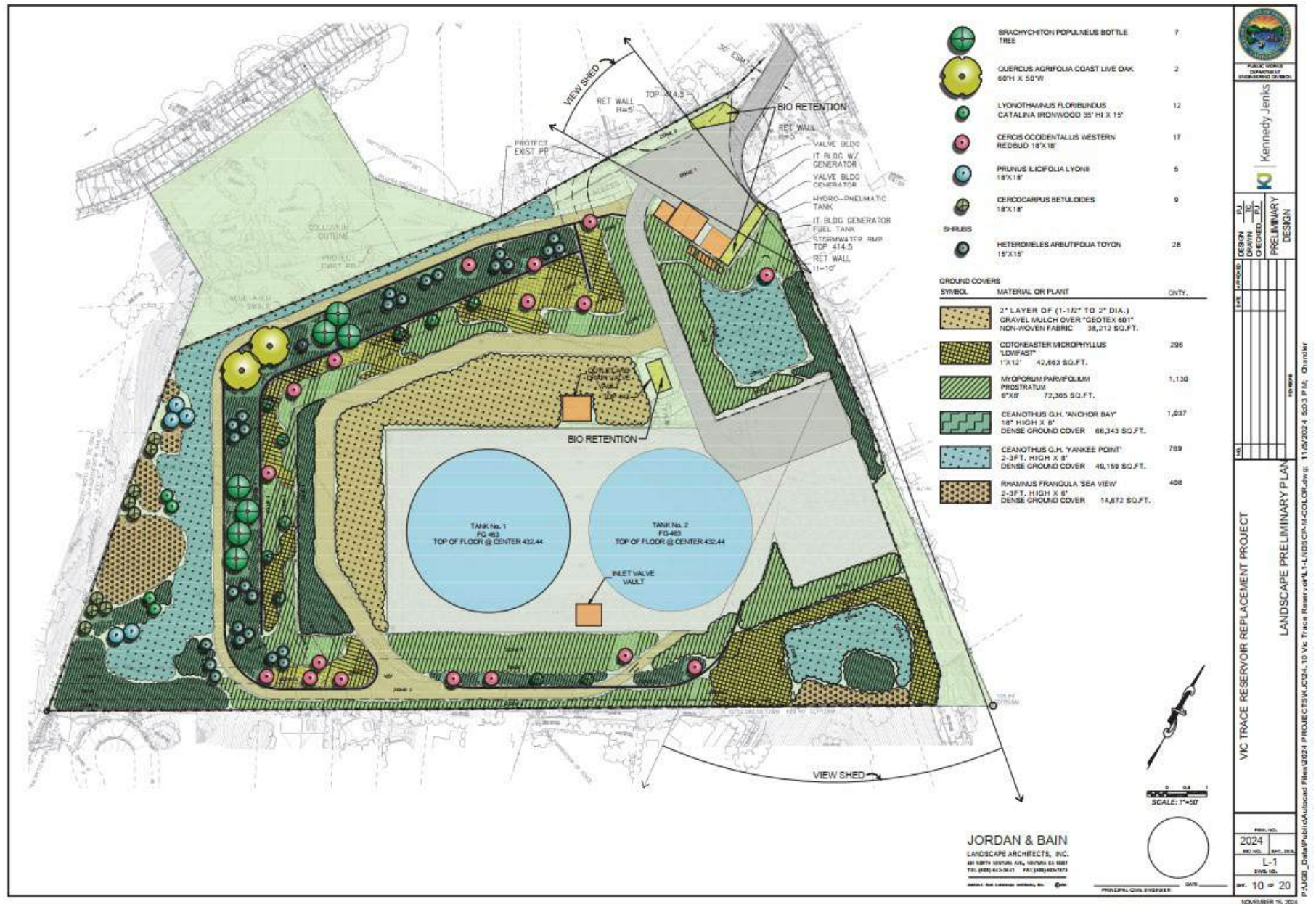
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### **Project Plans**

Project Site Plan



## Project Landscape Plan



## Appendix A

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### **Engineering Geology and Geotechnical Engineering Report**

**ENGINEERING GEOLOGY AND  
GEOTECHNICAL ENGINEERING REPORT**  
FOR THE VIC TRACE RESERVOIR,  
LA CORONILLA DRIVE,  
SANTA BARBARA, CALIFORNIA

PROJECT NO.: VT-24831-01  
DECEMBER 9, 2013

PREPARED FOR  
CITY OF SANTA BARBARA

BY  
**EARTH SYSTEMS SOUTHERN CALIFORNIA**  
**1731-A WALTER STREET**  
**VENTURA, CALIFORNIA**



**Earth Systems**  
**Southern California**

1731-A Walter Street  
Ventura, CA 93003  
(805) 642-6727  
Fax (805) 642-1325

December 9, 2013

Project No.: VT-24831-01

Report No.: 13-10-2

Attention: Amanda Flesse  
City of Santa Barbara Public Works Department, Engineering Division  
630 Garden Street  
Santa Barbara, CA 93101-1656

Project: Vic Trace Reservoir Geotechnical Survey  
La Coronilla Drive  
Santa Barbara, California

As authorized, we have performed a study to evaluate geotechnical conditions at the Vic Trace Reservoir located to the south of La Coronilla Drive in the City of Santa Barbara, California. The accompanying Engineering Geology and Geotechnical Engineering Report presents the results of our subsurface exploration and laboratory testing programs, as well as our conclusions and recommendations pertaining to geotechnical aspects of project design.

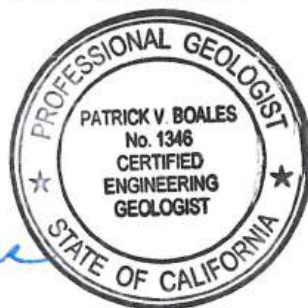
We have appreciated the opportunity to be of service to you on this project. Please call if you have any questions, or if we can be of further service.

Respectfully submitted,

**EARTH SYSTEMS SOUTHERN CALIFORNIA**

*Patrick V. Boales*

Patrick V. Boales  
Engineering Geologist



*Richard M. Beard*  
12/10/13

Richard M. Beard  
Geotechnical Engineer



Copies: 4 - City of Santa Barbara (3 via US mail, 1 via email)  
1 - Project File

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## INTRODUCTION

This report presents results of a study performed to evaluate the geotechnical conditions at the City of Santa Barbara's Vic Trace Reservoir at 740 Dolores Drive near La Coronilla Drive. The 10 million gallon potable water reservoir was constructed in 1955. In the ensuing years, voids have formed in various areas surrounding it. One set was identified and repaired in the 1960s along the northeastern edge of the facility near the fill and drain line connections. Over the last 10 years, another set has formed near the southwestern corner, and despite repair efforts, these voids have continued to enlarge. Concerns exist as to whether the voids threaten the integrity of the reservoir.

The purpose of the geotechnical study that led to this report was to analyze the geology and soil conditions of the site to help determine the cause of void creation, evaluate the impact of the voids on the reservoir, and to provide recommendations to remediate the affected areas of the facility. Geotechnical conditions that were analyzed included potential geohazards, both natural and those that could be experienced as a result of void formation, surface and subsurface soil types, soil expansion potential, and the presence or absence of subsurface water. The scope of work included:

1. Reviewing reservoir construction documents, subsequent inspection and repair reports provided by the City of Santa Barbara with respect to the Vic Trace Reservoir.
2. Reconnoitering and geologically mapping the site.
3. Reviewing stereographic pairs of aerial photographs taken of the site and surrounding areas between 1956 and 2010.
4. Reviewing pertinent geologic literature.
5. Utilizing Geosites Locators to perform a Ground Penetrating Radar survey of the paved areas immediately around the reservoir.
6. Drilling, sampling, and logging three bucket auger borings, seven hollow-stem auger borings, and four backhoe pits to study geologic, soil, and groundwater conditions.
7. Laboratory testing of samples obtained from the subsurface exploration to determine physical and engineering properties of site soils.
8. Consulting with City representatives and design professionals.

9. Analyzing the geotechnical data obtained.
10. Preparing this report.

Contained in this report are:

1. Descriptions and results of field and laboratory tests that were performed.
2. Discussions pertaining to the local geologic, soil, and groundwater conditions.
3. Conclusions pertaining to geohazards that could affect the site.
4. Conclusions and recommendations pertaining to potential remedial site grading and structural design.

### **SITE DESCRIPTION AND HISTORY**

Vic Trace Reservoir is located east of Dolores Drive and south of La Coronilla Drive in the City of Santa Barbara (see Vicinity Map in Appendix A). The reservoir, which was constructed in 1955, is 380 feet long by 248 feet wide and 20 feet deep. The original grading plan (titled Plot Plan and Typical Sections by James M. Montgomery, 1954) indicate that the nearly flat bottom of the reservoir was cut into natural materials, and that the finished surfaces at the perimeter were underlain by cut and fill areas. Interior reservoir slopes had gradients of 2:1 (horizontal to vertical).

Fill slopes surrounding the northwest and southwest sides of the reservoir were originally planned at 2.5:1 (according to the 1954 plan), but it appears that they were actually built at 2:1. Finished grades at the pavement surrounding the reservoir were originally planned to be at 455 feet above sea level, whereas existing grades are at about 464 feet (based on City of Santa Barbara topographic maps). (Part of this discrepancy might be resolved by a bench mark shown on the pre-1988 quadrangle maps with an elevation of 459, and more recent maps by the City of Santa Barbara showing it with an elevation of 463 feet.) Based on interpretation of existing topography and aerial photographs taken in 1956 versus the plan, it appears that originally proposed fills to the northeast of the reservoir encompassed areas that were larger than those originally planned, whereas an fill slope that was to be located at the southeastern corner was not built.

LeRoy Crandall and Associates (Crandall) responded in 1963 to reports of cavern formation below the paved berm adjacent to the catch basin on the northwestern side of the reservoir. Exploration consisted of drilling, downhole logging, and sampling 11 borings ranging in depth from 10 to 20.5 feet below the berm grade surrounding the reservoir. Crandall concluded that the caverns formed by water migrating through a combination of shrinkage cracks in the berm area and gopher holes. The relatively flat gradient of the berm was assumed to play a part in that it allowed water to stand for periods of time, thus allowing seepage into the conduits originally formed by the cracks and burrows. Ongoing flow caused erosion and enlargement of the conduits. It is our understanding that the caverns and voids observed during the Crandall study were repaired by overexcavation and recompaction, or by pressure grouting.

Additional voids were noted by City of Santa Barbara staff within the last 10 years in the berm near the southwestern corner of the reservoir. When first observed by Earth Systems on May 14, 2013, the largest void in that location was found to extend downward to at least 9 feet below the berm grade.

Fill slopes to the southwest of the reservoir are covered mostly with a growth of grasses and weeds, whereas fill slopes to the northeast are primarily covered in ice plant. Natural slopes have a variable growth of light chaparral. Although all non-paved areas of the site show evidence of an abundance of animal burrows, they are most common in the fills.

## **GEOLOGY**

Vic Trace reservoir is located on the Mesa area of the City of Santa Barbara, which in turn lies in the western Transverse Ranges. The Santa Barbara area and the Transverse Ranges are characterized by ongoing tectonic activity, where Tertiary and Quaternary sediments have been folded and faulted along predominant east-west structural trends. Although there are several faults located within the region, the nearest known fault of significant activity (i.e. the Lavigia fault, also known as the North Channel Slope fault) is located approximately 1,000 feet south of the subject site. The project area is not located within any of the "Fault Rupture Hazard Zones" that have been specified by the State of California (C.D.M.G. 1972, Revised 1999).

Bedrock underlying the site is the Santa Barbara Formation (Qsb) of Pleistocene age. The Santa Barbara Formation is comprised of shallow marine origin. Units encountered in the field study included massive to crudely bedded, poorly consolidated sands and silts. Soft sediment structures were also encountered, and are interpreted to be representative of syndepositional formation during aggradation, in which loading led to de-watering of pores. Escaping pore water formed sand dikes and intrusions which also obscured primary bedding features.

Artificial fill (af) was encountered in most of the borings drilled through the paved berms along the northwestern and southwestern sides of the reservoir, as well as the flat area northeast of the facility. Based on interpretation of aerial photographs taken in 1956, it appears that the fill that was encountered in the subsurface investigation was placed during grading for the reservoir. Fill materials were found to consist primarily of silty sands and sandy silts. Fill thicknesses appear to be greatest under the berm along the southwestern side of the reservoir, with estimated depths ranging up to about 14.5 feet below the paved surface.

Strikes of bedding measured in units of the Santa Barbara Formation within Bucket Auger Borings BA-1 and BA-3 were northerly orientated, and ranged from N26°W to N42°E. (Bedding attitudes could not be measured in Boring BA-2 due to the massive nature of the native materials underlying artificial fill materials.) Due to the numerous expressions of soft sediment deformation in the bedrock units, and possibly the proximity to the axis of an anticline, dips were found to be variable, ranging from 12° to 15° down to the north and 12° to 15° down to the south, with both dip directions observed within each boring. Regional mapping appears to indicate that the southward dips are more common in the area.

No faults were observed to be located on or trending into the subject property during the field study, during reviews of the referenced geologic literature, or during review of the aerial photographs taken of the site.

Landforms that could potentially be representative of a landslide were interpreted from air photos to be approximately 400 feet (minimum) southeast of the southeastern corner of the reservoir. None of the referenced geologic maps show the feature to be a landslide.

A debris flow (Qdf) located approximately 175 feet northwest of the northwest corner of the reservoir was observed in aerial photographs. It appears likely that the debris flow formed in about 1995.

## **GEOLOGIC HAZARDS**

Geologic hazards that can potentially impact a site include seismic shaking, fault rupture, landsliding, liquefaction and flooding.

### Seismic Shaking

Although the site is not within a State-designated "fault rupture hazard zone", it is located in an active seismic region where large numbers of earthquakes are recorded each year. Historically, major earthquakes (i.e. those with Richter magnitudes greater than 7.0) felt in the vicinity of subject site have originated from faults outside the area. These include the December 21, 1812 "Santa Barbara Region" earthquake, that was presumably centered in the Santa Barbara Channel, the 1857 Fort Tejon earthquake, the 1872 Owens Valley earthquake, and the 1952 Arvin-Tehachapi earthquake.

It is assumed that the 2010 California Building Code will be applicable to the proposed project. This building code introduces several seismic design parameters that are primarily influenced by the geographic site location with respect to active and potentially active faults, and with respect to subsurface soil or rock conditions. The seismic design parameters presented herein were calculated by determining the jobsite coordinates (34.4047° north latitude, and 119.7158° west longitude), entering them into the U.S.G.S. Ground Motion Parameter Calculator for Site Class B soils, then entering the calculated "short period" and "one second" spectral responses into a spreadsheet that adjusts for the actual site class of soils (Site Class C) and Occupancy Category IV (i.e. Critical Structures). For the Maximum Credible Earthquake, the Short Period Spectral Response ( $S_S$ ) was found to be 1.955 g, and the 1 Second Spectral Response ( $S_1$ ) was found to be 0.737 g. For design purposes, the Short Period Spectral Response ( $S_{DS}$ ) was found to be 1.303 g, and the 1 Second Spectral Response ( $S_{D1}$ ) was found to be 0.639 g. (A listing of the calculated 2010 CBC and ASCE 7-05 Seismic Parameters is presented in Appendix C of this report. These values are appropriate for a 10% probability of exceedence in 50 years.)

Table 1 (see Appendix C) lists the significant "active" and "potentially active" faults within a 63-mile (100-kilometer) radius of the subject site. The distance between the site and the nearest portion of each fault is shown, as well as the respective estimated maximum earthquake magnitudes, and the deterministic mean site peak ground accelerations. (It should be noted that the North Channel Slope fault is considered herein to be equivalent to the Lavigia fault as well as part of the Mesa fault complex.)

#### Fault Rupture

Surficial displacement along a fault trace is known as fault rupture. Fault rupture typically occurs along previously existing fault traces. As mentioned in the "Structure" section above, no known fault traces were observed to be crossing the site. As a result, it is the opinion of this firm that the potential for fault rupture on this site is low.

#### Landsliding

As mentioned previously, there are possible signs of landsliding near the site, but no existing landslides were observed on the facility, or within a distance that poses a hazard to the reservoir.

It should be noted that a generalized "landslide potential" classification by Bezore and Wills (2000) includes the site and much of the Mesa area in a "high" risk zone. The report also indicates that landslides in the vicinity of the subject site are "common to very common", and that bedrock units are "generally softer, weaker, and less resistant to erosion". The draft Seismic Safety Element (Rodriguez Consulting, Inc., 2013) has a similar characterization of stability of areas in the general vicinity of the site. However, bedding within the Santa Barbara Formation below the subject site is crudely defined and discontinuous. General indications are that bedrock dips southwesterly, which is neutral to the steepest slope to the southeast of the reservoir, and this is typically considered to be a relatively stable geologic condition.

The "Analyses of Stability of Descending Slopes" section elsewhere within this report includes detailed engineering evaluation of the site's slope stability.

### Liquefaction

Earthquake-induced vibrations can be the cause of several significant phenomena, including liquefaction in fine sands and silty sands. Liquefaction results in a loss of strength and can cause structures to settle or even overturn if it occurs in the bearing zone. Liquefaction is typically limited to the upper 50 feet of soils underlying a site.

Fine sands and silty sands that are poorly graded and lie below the groundwater table are the soils most susceptible to liquefaction. Soils that have  $I_c$  values greater than 2.6, soils with plasticity indices greater than 7, sufficiently dense soils, and/or soils located above the groundwater table are not generally susceptible to liquefaction.

An examination of the conditions existing at the site, in relation to the criteria listed above, indicates the following:

1. Groundwater was not encountered under this site within the upper 50 feet.
2. The facility is underlain at shallow depths by Santa Barbara Formation bedrock that is sufficiently dense to prevent susceptibility to liquefaction.

Based on the above, it is the opinion of this firm that a potential for liquefaction does not exist at this site.

### Flooding

Earthquake-induced flooding types include tsunamis and seiches. Due to the inland location of the site, hazards from tsunamis and seiches are considered extremely unlikely. As a result, seismically-induced flooding should not be considered a potential hazard.

The site is located within an area designated by FEMA (2012) as an "area determined to be outside the 0.2% annual chance floodplain". As a result, it appears that the hazard posed by storm-induced flooding is low.

## CURRENT GEOTECHNICAL CONDITIONS

Most of the near-surface soils underlying the reservoir include Santa Barbara Formation units below the northeastern berm, and artificial fill under most of the other berm areas. Old artificial fill soils encountered within the borings are generally characterized by variable blow counts and in-place densities. Signs of krotovina (i.e. infilled burrows) were relatively common within the upper 15 feet. Samples of Santa Barbara Formation units yielded relatively high blow counts and in-place densities. Testing indicates that soils under the berms are in the "very low" to "low" expansion ranges. [A classification of soil expansion ranges is included in Appendix B of this report.]

Paved areas around the reservoir perimeter are relatively flat, although the original design was to have all water flow toward a catch basin on the northwestern side of the reservoir. Based on mud stains, it appears that water gathers at the southwest and northwest corners of the facility. It is likely that the ponding has been caused by fill settlement over time.

The Ground Penetrating Radar (GPR) study of the paved berm areas identified some anomalies in the subsurface below the existing pavement, including the large, previously identified void under the southwestern corner of the facility, and a small, nearly circular void near the catch basin. Additional exploration was performed to evaluate the anomalies, and the majority of those that were identified along the northeastern berm near the catch basin were found to be dense, not voided, and were probably within repairs done in 1963 as recommended by Crandall. However, the circular void between Stations 1+75 and 1+80, once opened, was found to extend to a depth of about six inches, with soft soils below (Photo No. 1).

Despite the moderately high to high in-place densities of the soils, numerous burrows were noted throughout the facility. The concentration of burrows on the slope to the southwest of the facility was especially high, and the sizes of surface burrow orifices were larger there than in other areas of the site. This was especially notable immediately adjacent to the southwestern corner of the reservoir, where the large void is located under the paving.

Exploration of the slope area below the southwestern side of the facility was performed with a backhoe so that three-dimensional views of the subsurface could be generated. Numerous nearly cylindrical-shaped burrows with diameters ranging from 2 inches to 8 inches were observed in the upper 3.5 feet of Backhoe Trench Nos. T-1, T-2, and T-4 (see Photo Nos. 2 and 3). However, the most significant features that were observed (in Trench T-2) were subsurface erosional channels encountered at depths ranging from about 3 to 9.5 feet below the ground surface (Photo No. 4). The largest erosional channel was approximately 5 feet high and 4 to 12 inches wide with a meandering configuration trending down to the southwest. Water fed via fire hose into the void at the southwestern corner of the facility by Earth Systems staff exited the slope through the larger of the observed erosional channels (Photo No. 5), although it could not be verified if all the water exited at that point. The exit point corresponded to an area where light colored soils had accumulated above the growth of weeds and grasses near the toe of the fill slope (Photo No. 6).

Trench T-3 was excavated about 75 feet below Trench T-2, and below the accumulation of soils at the toe of the fill slope. The extent of burrowing was far less severe than within the other trenches, and none of the water fed into the void exited through Trench T-3 or areas adjacent to T-3 below the fill slope.

Another area of accumulated light-colored soil was noted below Trench T-4, which was excavated approximately 170 feet northwest of Trench T-1. However, no anomalies were found by the GPR in the paved area above T-4, and the extent of burrowing appeared less severe than the area near the other trenches. Regardless of the lesser amount of evidence, formation of additional erosional channels could be occurring within this area at present.

No voids have been noted by City Staff or by the GPR performed in the paved areas of the facility that are underlain by native soils, i.e. the northeast flank and the eastern half of the southeastern flank.

Samples of near-surface soils were tested for pH, resistivity, soluble sulfates, and soluble chlorides to provide data for evaluating corrosivity or reactivity of various construction materials (such as concrete and piping) with on-site soils. (Test results are provided in Appendix B.) It should be noted that sulfate contents (ranging from 19

mg/kg to 130 mg/kg) are in the "S0" (i.e. "negligible" severity range of Table 4.2.1 of ACI 318; therefore, it appears that special concrete designs will not be necessary for any future improvements based on these measured sulfate contents. Based on criteria established by the County of Los Angeles, measurements of resistivity (1,800 ohms-cm to 4,900 ohms-cm) of near-surface soils indicate that they are "corrosive" to "moderately corrosive" to ferrous metal (i.e. cast iron, etc.) pipes.

Groundwater was not encountered in any of the borings, including Boring BA-3, which was drilled to a depth of 50 feet below the ground surface in a relatively low area of the property. Furthermore, no unusually moist zones were encountered within the borings drilled from the perimeter of the facility to depths of at least 10 feet below the bottom of the reservoir. Thus, based on the information gathered from the borings and trenches, it does not appear that the reservoir is leaking.

#### **ANALYSES OF GROSS STABILITY OF EXISTING SLOPES**

Two geologic cross-sections were constructed through the descending slopes below the reservoir where the gradients were steepest and the heights were greatest (see Site Plan/Geologic Map). Geologic Cross-Section along A-A' was constructed along an east-west alignment to the west of the reservoir, and Geologic Cross-Section along B-B' was constructed along a southeast to northwest alignment through the southeastern corner of the reservoir. Subsurface geometry was based on data collected from the bucket auger borings drilled on the site. Surface grades were based on elevations shown on the City of Santa Barbara topographic map of the area.

Density data were based on averaging results of moisture/density tests. General strength parameters for Santa Barbara formation units and existing artificial fill soils were based on averages of the shear strength data from laboratory test results for the appropriate material types provided in Appendix B of this report. Santa Barbara formation units were considered to be anisotropic within Geologic Cross-Section along A-A', with along-bedding strengths equal to the "lower bound" strength measured among shear tests performed on clays within the formation. Peak strengths were utilized for seismic screening analyses, and ultimate strengths were used for analyses of static conditions, with the exception that the lower-bound ultimate

strengths were used for along-bedding strengths for clays for both static and seismic conditions. (Scatter diagrams of the direct shear data are provided in Appendix B.)

Summaries of the soil data used in the stability analyses are as follows:

| Material<br>Type | Moist<br>Density | Peak<br>Cohesion | Ultimate<br>Cohesion | Peak<br>Angle | Ultimate<br>Angle |
|------------------|------------------|------------------|----------------------|---------------|-------------------|
| Qsb*             | 117.7 pcf        | 645 psf          | 170 psf              | 29.1°         | 30.6°             |
| Qsb**            | 117.7 pcf        | 30 psf           | 30 psf               | 30.5°         | 30.5°             |
| af               | 122.7 pcf        | 0 psf            | 0 psf                | 42.0°         | 34.3°             |

\* = General parameters for Santa Barbara Formation

\*\* = Along-bedding (lower bound) parameters for clay samples of Santa Barbara Formation

Pseudostatic conditions were analyzed using "screening procedures" discussed in SCEC's guidelines (2002) for evaluation of slope stability. To perform the screening procedure, the seismic coefficient ( $k_{eq}$ ) was determined based on the following parameters:

MHA<sub>r</sub> (firm rock acceleration) = 0.52g [equal to SDS (1.303g) divided by 2.5];

Design earthquake = 7.5 Mw;

Distance to seismic source = 2 km;

Threshold displacement = 5 cm;

Factor  $f_{eq}$  = 0.569.

Based on these factors, and the equation  $k_{eq} = f_{eq}(MHA_r/g)$ ,  $k_{eq}$  was found to be equal to 0.296.

Bedding planes with the Santa Barbara formation are generally poorly developed and, as such, are considered relatively discontinuous. However, Geologic Cross-Section along A-A' depicts continuous bedding planes dipping at about 12° down to the west. Although the overall topography is relatively gentle [about 3.5:1 (horizontal to vertical)] to the west of the reservoir, and rotational types of failures would be unlikely, along-bedding failures were analyzed while assuming continuous clay bedding planes underlie the slope.

Stability along Section A-A' was analyzed using Janbu's Method for analyzing translational failure types (BLOCK2) where active and passive portions of sliding surfaces were generated according to Rankine theory, as implemented by the GSTABL7 program. Static conditions were analyzed, and a "seismic screening" analysis was performed. In each analysis, 500 trial failure surfaces were initiated from an area near the toe of slope, and run essentially parallel to bedding orientations to areas near the berm supporting the west wall of the reservoir.

For static conditions, the minimum factor of safety along Section A-A' was found to be 2.33, which is greater than the minimum requirement of 1.5. For the seismic screening analysis, the minimum factor of safety was found to be 1.09, which is greater than the minimum requirement of 1.0; thus, no significant displacements would be expected. Based on these analyses, deep-seated translational failures would not be anticipated to the west of the reservoir, or through the areas northwest of the reservoir, where slope heights are less, and slope gradients are similar.

Additional analyses were run through the fill slope illustrated on Section A-A'. Translational failures would not be anticipated through the fill; thus stability was analyzed using Janbu's Method for analyzing circular failure types, as implemented by the GSTABL7 program. One thousand trial failure surfaces were initiated from each of four locations near the toe of the steepest portion of the fill slope, and the minimum factors of safety among the trial surfaces were determined.

For static conditions, the minimum factor of safety through the existing fill in Section A-A'' was found to be 1.72, which is greater than the minimum requirement of 1.5. For the seismic screening analysis, the minimum factor of safety was found to be 1.15, which is greater than the minimum requirement of 1.0; thus, no significant displacements would be expected. Based on these analyses, deep-seated rotational failures within the existing fills would not be anticipated, although it should be noted that continued subsurface erosion could reduce the strength of the fill to the point where failures could be conceivable.

Geologic Cross-Section along B-B' illustrates the natural slope below the southeastern corner of the reservoir. In this area, bedding planes dip into the slope; thus, planar or block-type failures would not be anticipated. For this situation, where translational

failures would be considered unlikely, stability was analyzed using Janbu's Method for analyzing circular failure types, as implemented by the GSTABL7 program. Two thousand trial failure surfaces were initiated from four locations near the toe of slope, and the minimum factors of safety among the trial surfaces were determined.

For static conditions, the minimum factor of safety along Section B-B' was found to be 1.84, which is greater than the minimum requirement of 1.5. For the seismic screening analysis, the minimum factor of safety was found to be 1.26, which is greater than the minimum requirement of 1.0; thus, no significant displacements would be expected. Based on these analyses, deep-seated rotational failures along the slope would not be anticipated.

(Plots of slopes showing the failure surfaces and minimum factors of safety are provided in Appendix E, as are summaries of the input and slice data. The geologic cross-sections are attached in Appendix A.)

#### **ANALYSES OF SURFICIAL STABILITY OF PROPOSED REMEDIATED SLOPES**

The surficial stability of soils expected to be exposed in remediated slope were analyzed using the Orange County Method. Strength parameters determined from direct shear testing of remolded samples of the existing fill materials comprising the slopes were utilized. The slope gradient was assumed to be 2:1, which is the existing gradient, and is also assumed to be the gradient of the remediated slope. The depth of saturation was assumed to be 4 feet.

With no reinforcement, the factors of safety for surficial stability were found to range from 0.66 to 0.77, which are all below the required minimum of 1.5. (Calculations are provided in Appendix E.) Factors of safety below 1.5 are considered indicative of potential surficial instability at the slope face. As a result, the data appears to indicate that proposed slopes, if not reinforced in some manner, would not be surficially stable.

Fill slopes reinforced with geogrids were considered as an appropriate alternative. Remedial fill slopes consisting of reworked fill materials that currently comprise the berms along the southwest and northwest sides of the reservoir were analyzed with Triaxial BX-1200 geogrids on 1.5-foot vertical spacings and 9.8-foot embedment depths.

The same parameters discussed previously for surficial stability were utilized in this analysis as well. Factors of safety were found to exceed 1.5, which are acceptable.

### **GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS**

Based on the studies described herein, it appears that a combination of poor drainage in the paved areas of the facility, formation of cracks and seams in the pavement, and extensive animal burrowing that extended from outside the fenced area to areas under the pavement have resulted in conduits in which water could flow and erode soils in the subsurface. Because the soils are susceptible to erosion, ongoing flows have enlarged the conduits by eroding the sides and lower sections, and flows have probably been significant during storm events. As the conduits enlarged, soils immediately underlying the points where the majority of water enters the subsurface, i.e. the southwestern facility corner, have been undermined; thus resulting in the void currently observed. (This process is similar to that opined by Crandall in 1963 with respect to northwestern flank voids.)

Because the conduits within which the water migrates are somewhat limited in size, it does not appear that the reservoir is unsafe at this time. However, repairs should be made to the voids to allow soils on the perimeter to continue to provide lateral support to the reservoir. In addition, measures should be implemented to reduce infiltration of water into the subsurface from the facility pavements.

The extent and quality of remediation of observed and interpreted features will depend on budgets available to the City, and whether short-term or long-term solutions are desired.

#### **The following measures should be considered for short-term solutions:**

Remove the pavement from the void areas shown on the attached Geologic Map. After water levels are reduced in areas adjacent to remedial work zones, void walls and bottoms should be trimmed until loose soils are completely removed, and the bottom of the excavation is level. If voids wider than 15 feet (as measured parallel to reservoir walls) are encountered within 10 feet of the reservoir walls, shoring may be necessary

to protect the walls prior to making the excavations for remedial work. (Alternatives can be provided once work begins and actual conditions can be observed.)

Where space is available (i.e. in directions away from the reservoir), the excavation should be stepped so that vertical exposures are no more than 3 feet high, and the overall gradient (counting the steps) is no steeper than 1.5:1 (horizontal to vertical). The intent is to expose conduits that have been fed through the voids, and create a safe working area for crews to achieve the next remedial steps.

Existing voids and/or erosional conduits encountered within the void excavations should be filled with controlled low-strength material (CLSM) applied directly into the conduits under pressure.

The enlarged void excavations should be backfilled with fill compacted to a minimum of 90% of maximum dry density, or with CLSM. If soil backfill is preferred, it would be prudent to utilize a burrowing animal-resistant barrier between the backfill soil and the existing soils on the outside edges of the excavation. Burrowing animal resistant barriers could potentially include certain kinds of geogrid, such as Tensar TX-5, and should probably not include metal fencing because of the corrosion potential of on-site soils.

Once the excavations are backfilled, grades should be adjusted to allow positive drainage away from the void areas, and from other areas where water currently ponds near the northwestern and southwestern facility corners. One possible solution to this issue would be to install additional catch basins, and construct storm drains down the adjacent slopes to velocity reducing structures below the toes of the fill slopes.

In any case, measures should be undertaken to prevent water from infiltrating the soils below the facility berms wherever possible. This could be accomplished by utilizing a geotextile liner below the repaved surface, or repaving could be done without the liner, but with the caveat crack sealing would be a regular maintenance item at least three or four times a year. Rapid surface drainage might alleviate the need for the liner.

**If a more permanent solution is to be undertaken, the following should be considered:**

Fill slopes below the western end of the southeastern flank, the southwestern flank, and much of the northwestern flank exhibit evidence of a severe burrowing animal problem. Most of the burrows appear to be limited to depths of about 3.5 feet (based on observations made in the backhoe pits). However, krotovina (i.e. an abandoned burrow that has been filled with organic material and soil from other soil horizons) were observed in samples obtained from depths as deep as 10.25 feet in Borings B-4 and B-7, and the erosional channels observed in Trench T-2 extended to depths of 9.5 feet below the slope face. Other erosional channels may be in the formative stages, particularly in the vicinities of Trench T-4 and Boring B-2. These voids are significant, and if they continue to enlarge, they could cause additional settlement and/or a decrease in stability.

Because of the voids, it might be prudent to reconstruct the fill slopes, at least below the southwest flank of the facility, where fill slopes are highest and the burrowing problems appear to be most significant. This should begin by removing the asphalt and concrete paving along the sides to be reconstructed to check further for additional, unidentified voids and/or voids. Repairs of voids within 10 feet of the reservoir edge should be repaired as described in the temporary measures provided above.

Any hillside grading or construction of fill slopes should conform to the minimum standards listed in Appendix J of the 2010 California Building Code. It is recommended that the Geotechnical Engineer and Engineering Geologist review the grading plans prior to grading and site development.

The existing ground surface should be initially prepared for grading by removing all vegetation, trees, large roots, debris, other organic material and non-complying fill. Organics and debris should be stockpiled away from areas to be graded, and ultimately removed from the site to prevent their inclusion in fills. Voids created by removal of such material should be properly backfilled and compacted. No compacted fill should be placed unless the underlying soil has been observed by the Geotechnical Engineer.

Fill slopes should be keyed and benched into firm natural ground. The keys should be tilted into the slope, should be a minimum of 12 feet wide, and should be a minimum of 2 feet deep on their outside edge. Backdrains should be placed under the fills as described below.

On-site soils may be used for fill once they are cleaned of all organic material, rock, debris and irreducible material larger than 8 inches. Fill and backfill placed at near optimum moisture in layers with loose thickness not greater than 8 inches should be compacted to a minimum of 90% of the maximum dry density obtainable by the ASTM D 1557 test method.

To reduce the potential for saturation of the fill comprising the fill slopes, it is recommended that backdrains be provided at vertical intervals that do not exceed 15 feet. The lowest drain should be placed in the keyway or just above the keyway (wherever flow by gravity to daylight can be first obtained). The drains should consist of 4-inch diameter perforated pipes (perforations placed downward) surrounded by 1 cubic foot per lineal foot of 0.75 to 1.5-inch rock wrapped in geotextile filter fabric. The drains at different elevations may be connected together in the subsurface by solid pipes, or may be drained to the slope face independently. All exit (solid) pipes should flow at a 1% minimum gradient to daylight on the slope faces.

Potential surficial stability issues would result if existing fill soils were reworked without enhancement during remedial fill slope construction. As a result, remedial fill slopes should be reinforced with Triaxial BX-1200 (or equivalent) geogrids on 1.5-foot vertical spacings with 9.8-foot (i.e. 3 meter) embedment depths. (Equivalency would need to be evaluated by the geotechnical engineer once properties of proposed alternative geogrids are available.) The edges of the geogrids should be aligned to be either at the slope face, or one foot from the finished slope face to accommodate additional geotextiles intended to help reduce the effects of burrowing rodents, as discussed below.

Fill slopes should be overfilled, compacted, and then cut back to one foot below planned configurations. As an alternative to overfilling and trimming, slope faces can be rolled with a sheepsfoot and trackwalked if this procedure is used every 3 feet of

vertical elevation gain during construction of the slope (not simply after the entire slope is constructed).

In addition to a more aggressive extermination program for burrowing animals, a burrowing animal-resistant geotextile should be considered as a supplemental measure. Major geogrid manufacturers were questioned regarding whether testing is performed on geogrids to determine resistance to burrowing, and they indicated that they are not. However, a geogrid such as Tensar TX-5, with small diameter openings and extruded polypropylene manufacturing processes, would be expected to reduce the possibility of successful burrowing by animals. The geogrid would be placed on the compacted fill comprising the slope at a depth of about one foot below the finished slope face elevation. Additional soil should be moisture conditioned and placed over the burrowing animal-resistant geogrid with care taken to prevent damaging the geogrid. Compaction by track-walking should be adequate.

Finished slopes should be planted with a drought-resistant assemblage of plants intended to enhance stability, as directed by a landscape architect. The intent would be to provide temporary irrigation until plant growth is initiated, then remove the irrigation system when appropriate.

Previously paved areas should either be adjusted to provide positive drainage to the existing catch basin, or additional catch basins should be installed to carry water effectively away from the facility. If new drainage features are installed, discharge areas should include velocity reducers due to the erodible nature of on-site soils.

The previously paved areas should be covered with a geotextile liner to prevent water from migrating down into the underlying soils prior to replacing pavement, as recommended above for short-term solutions.

In either case (i.e. short-term or long-term solution), it is recommended that Earth Systems Southern California be retained to provide Geotechnical Engineering services during site development and grading, and foundation construction phases of the work to observe compliance with the design concepts, specifications and recommendations, and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

### **ADDITIONAL SERVICES**

This report is based on the assumption that an adequate program of monitoring and testing will be performed by Earth Systems Southern California during construction to check compliance with the recommendations given in this report. The recommended tests and observations include, but are not necessarily limited to the following:

Review of remedial grading plans during the design phase of the project.

Observation and testing during site preparation, remedial grading, and placing of engineered fill. Compaction tests shall be made to determine the relative compaction of the fills in accordance with the following minimum guidelines: one test for each two-foot vertical lift; one test for each 1,000 cubic yards of material placed; one test at the final fill slope face for each four-foot of slope height; and one test for each 300 feet of length in areas to be repaved.

Consultation as required during construction.

### **LIMITATIONS AND UNIFORMITY OF CONDITIONS**

The analysis and recommendations submitted in this report are based in part upon the data obtained from the ground penetrating radar, the exploratory borings, and the test pits excavated on the site. The nature and extent of variations between and beyond the borings and test pits may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

The scope of services did not include any environmental assessment or investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater or air, on, below, or around this site. Any statements in this report or on the soil boring logs regarding odors noted, unusual or suspicious items or conditions observed, are strictly for the information of the client.

Findings of this report are valid as of this date; however, changes in conditions of a property can occur with passage of time whether due to natural processes or works of

man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside the control of this firm. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that it is the responsibility of the Owner, or of his representative to insure that the information and recommendations contained herein are called to the attention of the Engineers for the project and incorporated into the plan, and that the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

As the Geotechnical Engineers for this project, Earth Systems Southern California has striven to provide services in accordance with generally accepted geotechnical engineering practices in this community at this time. No warranty or guarantee is expressed or implied. This report was prepared for the exclusive use of the Client for the purposes stated in this document for the referenced project only. No third party may use or rely on this report without express written authorization from Earth Systems Southern California for such use or reliance.

It is recommended that Earth Systems Southern California be provided the opportunity for a general review of remedial designs and specifications in order that earthwork recommendations may be properly interpreted and implemented in the design and specifications. If Earth Systems Southern California is not accorded the privilege of making this recommended review, it can assume no responsibility for misinterpretation of the recommendations.

#### **AERIAL PHOTOGRAPHS THAT WERE ANALYZED AND REVIEWED**

Index Nos. HA-AN, I-6 and I-7, February 27, 1956, Scale 1:9,600.

Index Nos. SB-14, Frame Nos. 15, 16 and 17, June 25, 2003, Scale 1:12,000.

Index Nos. SB-17, Frame Nos. 15, 16, and 17, April 15, 2008, Scale 1:12,000.

Index Nos. SB-17, Frame Nos. 3-1, 3-2, and 3-3, March 16, 2010, Scale 1:12,000.

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Rodriguez Consulting, Inc., April 2013, City of Santa Barbara Public Review Draft Proposed General Plan Safety Element.

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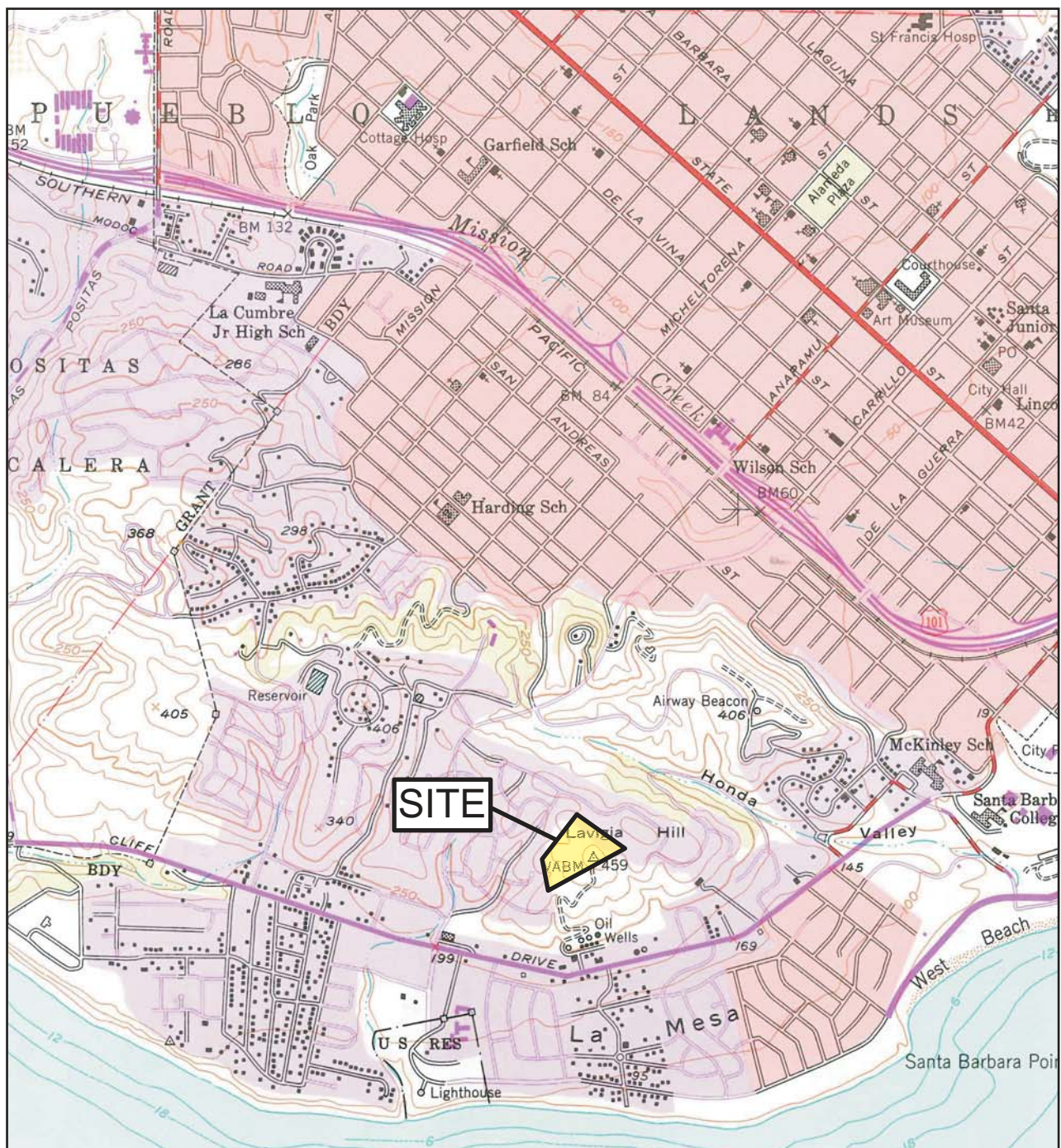
Southern California Earthquake Center (SCEC), 2002, Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Landslide Hazards in California.

Yerkes, R.F. and W.H.K. Lee, 1987, Late Quaternary Deformation in the Western Transverse Ranges, in "Recent Reverse Faulting in the Transverse Ranges, California", U.S.G.S. Professional Paper 1339.

Ziony, Joseph I. and Lucile M. Jones, 1989, Map Showing Late Quaternary Faults and 1978-84 Seismicity of the Los Angeles Region, U.S.G.S. Map MF-1964.

## **APPENDIX A**

Vicinity Map  
Regional Geologic Map  
Field Study  
Geologic Map (1" = 100')  
Site Plan (1" = 60')  
Geologic Cross-Sections  
Logs of Hollow-Stem Auger Borings  
Logs of Bucket Auger Borings  
Logs of Backhoe Pits  
Symbols Commonly Used on Boring Logs  
Unified Soil Classification  
Project Photographs



Base Map: USGS 7.5' Topographic Map of the Santa Barbara Quadrangle, 1967

Scale: 1 in. = 2,000 ft.

## VICINITY MAP

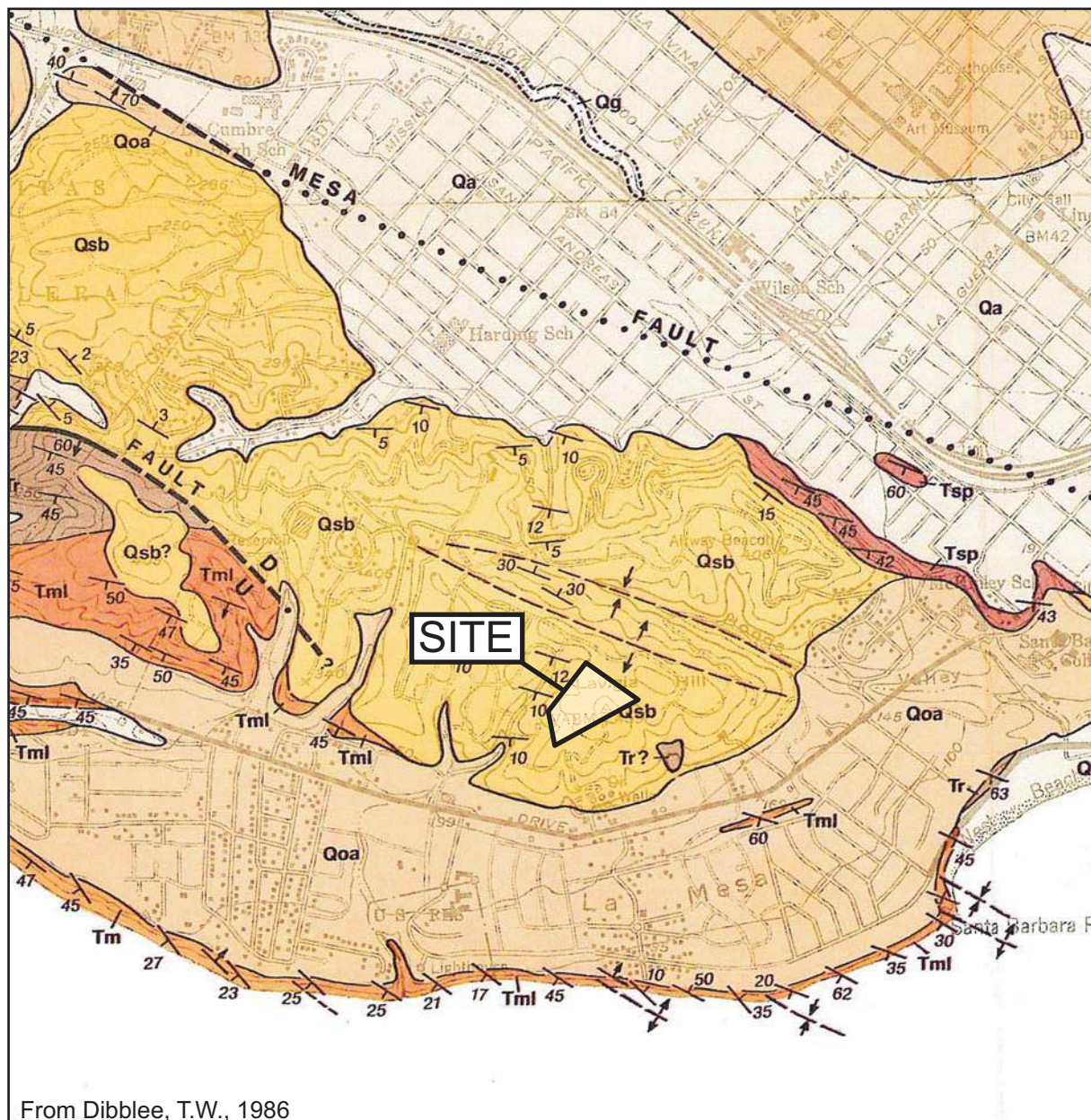
Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California



Earth Systems  
Southern California

SEPTEMBER, 2013

VT-24831-01



## LEGEND

- Quaternary**  
Qa Alluvium
- Quaternary-Tertiary**  
Qsb Santa Barbara Formation
- Tertiary**  
Tml Monterey Formation shale  
Tr Rincon Formation clay shale and claystone

- +— Syncline  
—+— Anticline
- Geologic contact
- Fault - Dashed where approximate dotted where buried.
- 25 Bedding Attitude  
20 Overturned Bedding

SCALE  
0 ft. ~ 1,000 ft. ~ 2,000 ft.



## REGIONAL GEOLOGIC MAP

Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California



**Earth Systems**  
Southern California

September 2013

VT-24831-01

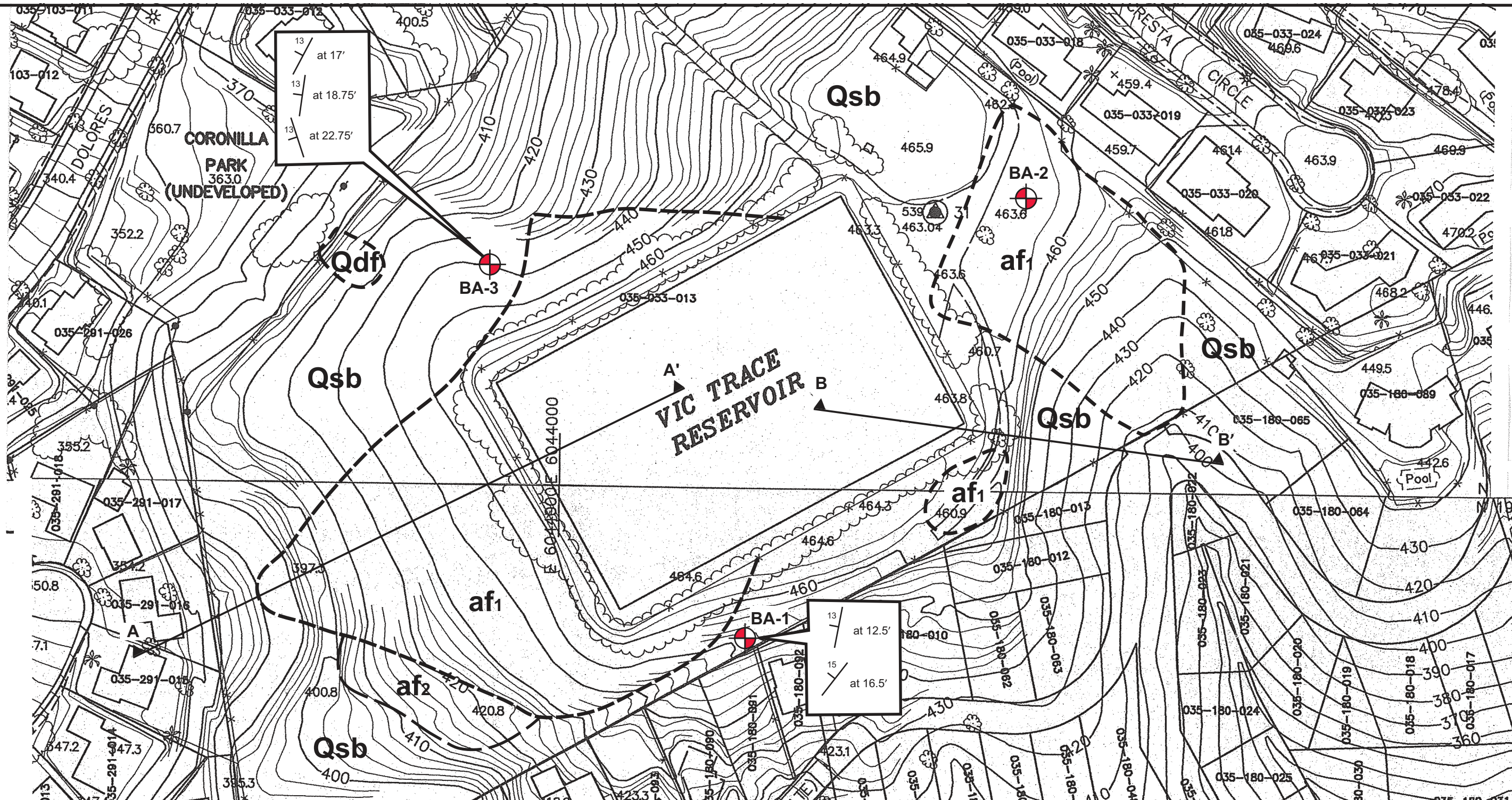
## FIELD STUDY

- A. A Ground Penetrating Radar survey was conducted by GeoSite Locators in the paved areas immediately surrounding the reservoir. The survey was conducted on August 6, 2013, using a Geophysical Survey Systems SIR 3000 Utility Scan System, wherein a dielectric signal is sent into the ground, and hyperbola signatures are generated where low or high density materials are encountered in the subsurface. The results of the survey are presented in Appendix D of this report.
- B. Seven hollow-stem auger borings were drilled to a maximum depth of 31.5 feet below the existing ground surface to observe the soil profile and to obtain samples for laboratory analysis. Three of the borings (Nos. B-1 through B-3) were drilled on August 12, 2013, using a CME-75 track-mounted drill rig. The other four borings (Nos. B-4 through B-7) were drilled on August 14, 2013, using a truck mounted CME-75 drilling rig. (The approximate locations of the test borings were determined in the field by pacing and sighting, and by using a Garmin 706S GPS unit, and are shown on the Site Plan/Geologic Map in this Appendix.) The borings were backfilled with a slurried mixture of cuttings and concrete.
- C. Three bucket auger borings (Nos. BA-1 through BA-3) were drilled to a maximum depth of 50 feet below the existing ground surface to observe the soil profile and subsurface geology, and to obtain samples for laboratory analysis. The borings were drilled between August 12 and 14, 2013, using SoilMec and LoDrill track mounted drilling rigs. The borings were downhole logged by an Engineering Geologist. (The approximate locations of the test borings were determined in the field by pacing and sighting, and are shown on the Site Plan/Geologic Map in this Appendix.) The borings were backfilled with cuttings that were tamped into place at regular vertical intervals of about 2 feet.
- D. Four exploratory backhoe test pits were excavated to a maximum depth of 10 feet below the existing ground surface to observe the soil profile, subsurface geology, and geotechnical conditions. The test pits were excavated on August 12, 2013, and were logged by an Engineering Geologist. (The approximate locations of the test pits were determined in the field by pacing and sighting, and are shown on the Site Plan/Geologic Map in this Appendix.) The borings were backfilled with cuttings that were tamped into place at regular vertical intervals of about 2 feet.
- E. Samples were obtained within the hollow-stem and bucket auger borings with a Modified California (M.C.) ring sampler (ASTM D 3550 with shoe similar to ASTM D 1586), and with a Standard Penetration Test (SPT) sampler (ASTM D 1586). The M.C. sampler has a 3-inch outside diameter, and a 2.42-inch inside diameter when used with brass ring liners (as it was during this study). The SPT sampler has a 2.00-inch outside diameter and a 1.37-inch inside diameter, but when used without liners, as was

### **FIELD STUDY (Continued)**

done for this project, the inside diameter is 1.63 inches. The samples were obtained from the hollow-stem borings by driving the sampler with a 140-pound automatic trip hammer dropping 30 inches in accordance with ASTM D 1586. Samples were obtained from within the bucket auger borings by driving the sampler with the Kelly bar of the drill rig dropping approximately 12 inches. The hammer was operated with a hydraulically powered reversing winch.

- F. Bulk samples of the soils encountered were gathered from the cuttings of selected hollow-stem auger borings.
- G. The final logs of the borings and test pits represent interpretations of the contents of the field logs and the results of laboratory testing performed on the samples obtained during the subsurface study. The final logs are included in this Appendix.

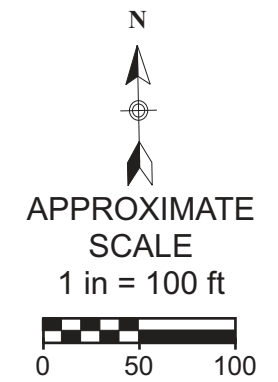


**LEGEND**

- af<sub>2</sub>** - ARTIFICIAL FILL, POST 1954
- af<sub>1</sub>** - ARTIFICIAL FILL, 1954
- Qdf** - DEBRIS FLOW
- Qsb** - SANTA BARBARA FORMATION

- APPROXIMATE GEOLOGIC CONTACT
- STRIKE AND DIP OF BEDDING
- LOCATION OF GEOLOGIC CROSS SECTION

- B-1** - BORING LOCATION
- BA-1** - BUCKET AUGER BORING LOCATION
- T-1** - BACKHOE PIT LOCATION



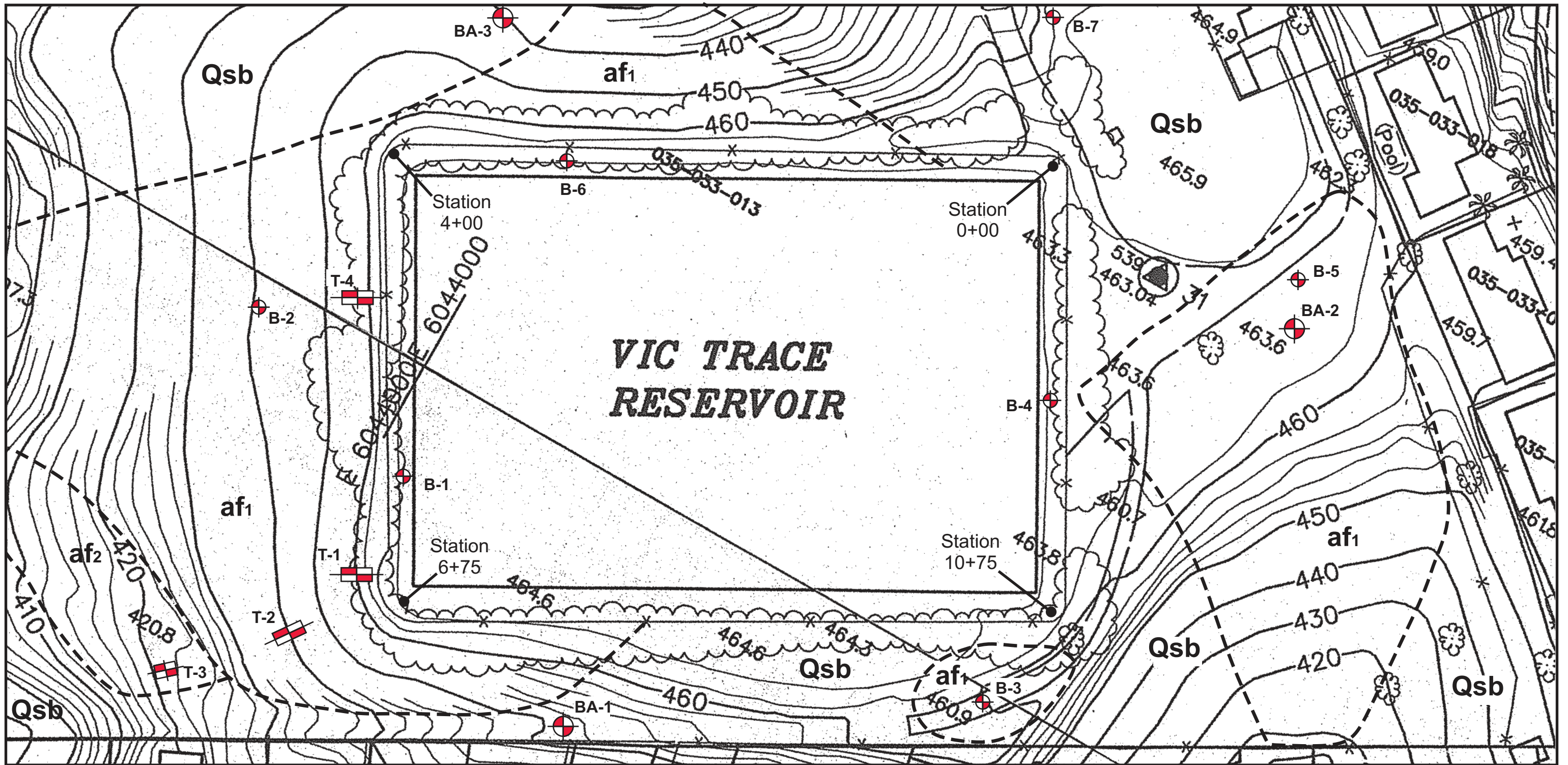
**SITE GEOLOGIC MAP**

Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California

 **Earth Systems**  
Southern California

September, 2013

VT-24831-01



## LEGEND

**af<sub>2</sub>**

- ARTIFICIAL FILL, POST 1954

**af<sub>1</sub>**

- ARTIFICIAL FILL, 1954

**Qsb**

- SANTA BARBARA FORMATION

- APPROXIMATE GEOLOGIC CONTACT

- STRIKE AND DIP OF BEDDING

- LOCATION OF GEOLOGIC CROSS SECTION



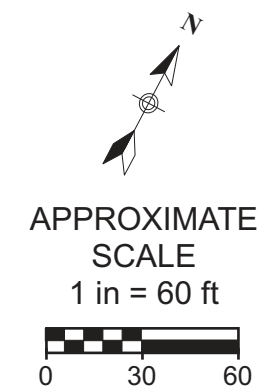
- BORING LOCATION



- BUCKET AUGER BORING LOCATION



- BACKHOE PIT LOCATION



## SITE PLAN / EXPLORATION LOCATIONS

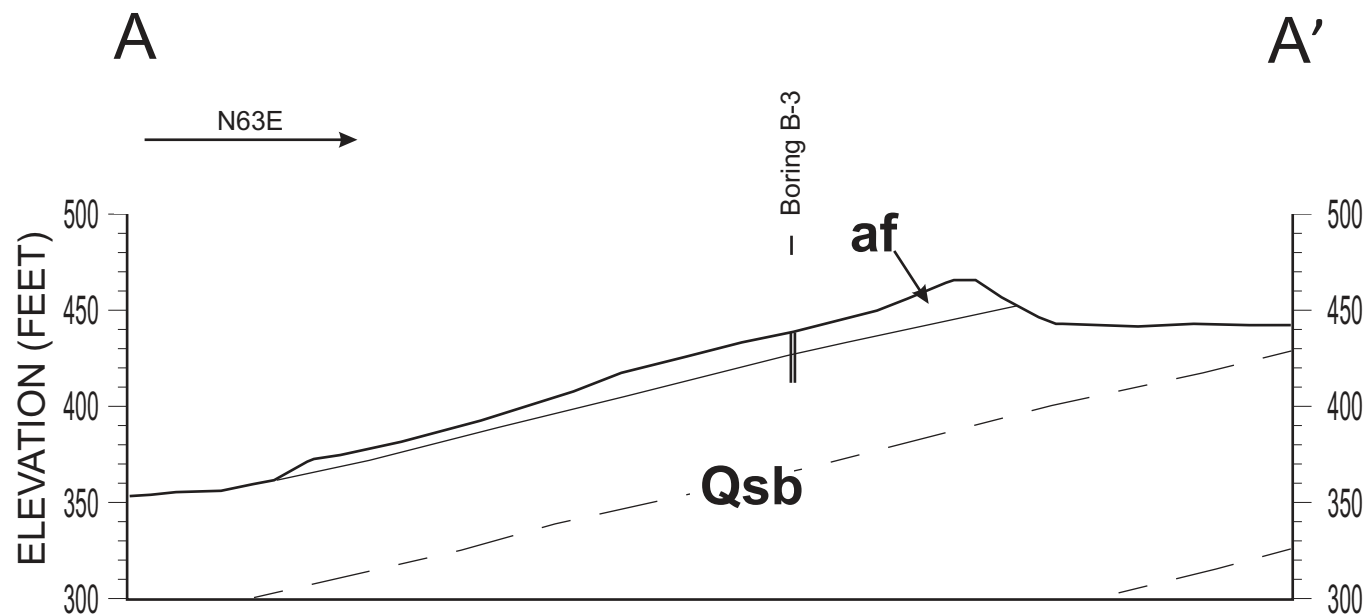
Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California



**Earth Systems**  
Southern California

September, 2013

VT-24831-01



SCALE  
1 in = 100 ft (H&V)

# **GEOLOGIC CROSS SECTION A-A'**

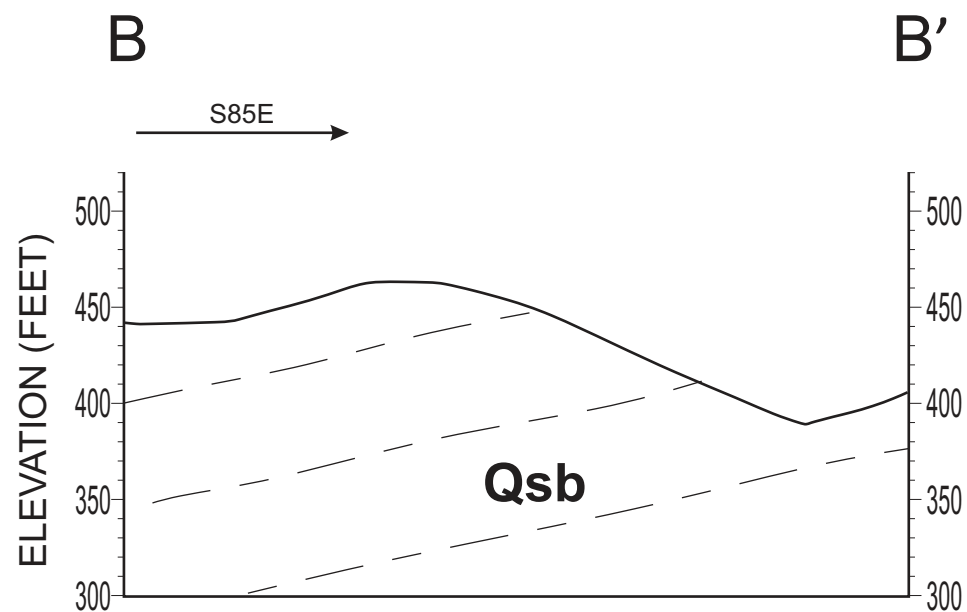
Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California



**Earth Systems**  
Southern California

September, 2013

VT-24831-01



SCALE  
1 in = 100 ft (H&V)

# **GEOLOGIC CROSS SECTION B-B'**

Vic Trace Reservoir  
La Coronilla Drive  
Santa Barbara, California



**Earth Systems**  
Southern California

September, 2013

VT-24831-01

**BORING NO: B-1**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 12, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6") | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                  |
|----------------|-------------|-----|-------------|-----------------------------------------|--------|------------|-----------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                         |        |            |                       |                         |                                                                                                                                                       |
| 0              |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                       |
|                |             |     |             | 12/23/34                                |        | SM         | 116.8                 | 10.8                    | <b>4" Asphalt</b>                                                                                                                                     |
|                |             |     |             | 10/11/14                                |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Silty sand; dark yellowish-brown; slightly moist; dense; fine sand; trace gravel; mottled.                               |
|                |             |     |             | 10/21/32                                |        | SM         | 104.8                 | 9.9                     | Same as above, except medium dense.                                                                                                                   |
| 5              |             |     |             | 8/6/8                                   |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Fine sand with silt; dark yellowish-brown; moist; loose.                                                                 |
|                |             |     |             | 16/38/50 for 5"                         |        | SM         | 114.7                 | 11.4                    | Same as above, except very dense.                                                                                                                     |
| 10             |             |     |             | 10/12/13                                |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Clayey silty sand; dark yellowish-brown; moist; medium dense; trace clay pockets; trace fine gravel; fine sand; mottled. |
|                |             |     |             | 16/47/50 for 5"                         |        | SM         | 116.8                 | 9.7                     | Same as above; except dense.                                                                                                                          |
|                |             |     |             | 9/12/18                                 |        | SM         |                       |                         | Same as above, except medium dense.                                                                                                                   |
|                |             |     |             | 25/50 for 5"                            |        | SM         | 117.6                 | 11.6                    | Same as above; except dense.                                                                                                                          |
| 15             |             |     |             | 11/13/15                                |        | SC         |                       |                         | <b>SOIL:</b> Clayey sand; dark medium brown; medium dense; slightly moist; trace fine sand; trace fine gravel.                                        |
|                |             |     |             | 50 for 6"                               |        | SC         | 106.2                 | 6.2                     |                                                                                                                                                       |
| 20             |             |     |             | 12/17/22                                |        | SM         |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; pale brown; slightly moist; dense; fine sand; trace oyster fossils (5mm)                            |
|                |             |     |             | 26/26/28                                |        | SM         | 109.1                 | 9.1                     | Same as above.                                                                                                                                        |
|                |             |     |             | 11/15/26                                |        | SC         | 98.5                  | 22.8                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Clayey sand; dark yellowish-brown; moist, medium dense; fine sand; some silt; trace pin-hole pores.             |
| 25             |             |     |             | 20/42/50 for 5"                         |        | SM         | 110.4                 | 15.2                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; pale yellowish-brown; slightly moist; very dense; fine sand; trace CaCo3 stringers.                 |
| 30             |             |     |             | 12/32/50 for 5"                         |        | SM         | 110.6                 | 8.2                     | Same as above; some shell pieces.                                                                                                                     |
| 35             |             |     |             |                                         |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b>                                                                                                                         |
|                |             |     |             |                                         |        |            |                       |                         | <b>Groundwater Was Not Encountered</b>                                                                                                                |
|                |             |     |             |                                         |        |            |                       |                         | Backfilled with native soil and cement mix                                                                                                            |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-2**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                               |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                    |
| 0              |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                    |
|                |             |     |             | 8/11/18                                |        | SM         | 105.8                 | 7.0                     | <b>ARTIFICIAL FILL (Af):</b> Silty Sand; dark yellowish-brown; slightly moist; medium dense; fine sand; trace gravel; mottled.<br>Same as above; some iron oxide staining.         |
|                |             |     |             | 11/13/13                               |        | SM         |                       |                         |                                                                                                                                                                                    |
|                |             |     |             | 17/38/41                               |        | SM         | 111.4                 | 8.0                     |                                                                                                                                                                                    |
| 5              |             |     |             | 13/10/10                               |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Fine sand with silt; dark yellowish-brown; moist; medium dense.<br><b>ARTIFICIAL FILL (Af):</b> Silty clayey sand; dark yellowish-brown; moist; dense |
|                |             |     |             | 14/31/44                               |        | SC         | 118.2                 | 10.1                    |                                                                                                                                                                                    |
|                |             |     |             | 12/14/14                               |        | SC         |                       |                         |                                                                                                                                                                                    |
| 10             |             |     |             | 23/32/32                               |        | SC         | 123.8                 | 10.4                    | <b>SOIL:</b> Clayey sand; dark yellowish-brown; moist; dense; trace fine sandstone gravel.<br>Same as above, except medium dense.                                                  |
|                |             |     |             | 31/12/11                               |        | SC         |                       |                         |                                                                                                                                                                                    |
| 15             |             |     |             | 10/24/25                               |        | SM         | 123.0                 | 1.7                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; light yellowish-brown; moist; medium dense; fine sand; little silt<br>Same as above.                                             |
|                |             |     |             | 27/50 for 5"                           |        | SM         | 118.9                 | 6.7                     |                                                                                                                                                                                    |
| 20             |             |     |             |                                        |        |            |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Poorly graded sand; dense; moist; trace silt; many shell fragments; trace oyster shells.                                                     |
|                |             |     |             | 33/50 for 6"                           |        | SP         | 104.9                 | 3.8                     |                                                                                                                                                                                    |
| 25             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                    |
| 30             |             |     |             | 27/50 for 3.5"                         |        | SP         | 107.5                 | 8.0                     | Same as above.                                                                                                                                                                     |
| 35             |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with native soil and cement mix                                                      |
|                |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                    |
|                |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                    |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-3**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                  |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                       |
| 0              |             |     |             | 16/15/14                               |        | SM         | 109.6                 | 7.8                     | <b>ARTIFICIAL FILL (Af):</b> Silty Sand; dark yellowish-brown; moist; medium dense; fine sand.<br>Same as above.                                                      |
|                |             |     |             | 6/8/9                                  |        | SM         |                       |                         |                                                                                                                                                                       |
|                |             |     |             | 9/18/21                                |        | SM         | 105.1                 | 9.2                     |                                                                                                                                                                       |
| 5              |             |     |             | 6/6/7                                  |        | SM         |                       |                         |                                                                                                                                                                       |
|                |             |     |             | 11/17/19                               |        | SM         | 105.7                 | 15.7                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; dark yellowish- brown; medium dense, moist; fine sand; trace carbon specs.<br>Same as above.                        |
|                |             |     |             | 4/5/6                                  |        | SM         |                       |                         |                                                                                                                                                                       |
| 10             |             |     |             | 7/21/19                                |        | SM         | 101.3                 | 23.2                    |                                                                                                                                                                       |
|                |             |     |             | 5/5/8                                  |        | SM         |                       |                         |                                                                                                                                                                       |
|                |             |     |             | 19/32/43                               |        | CL         | 112.1                 | 16.4                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Sandy silty, clay; olive-brown, moist; hard                                                                                     |
| 15             |             |     |             | 9/12/18                                |        | SM         |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; dark yellowish-brown; dense; moist; trace crushed shells<br><br>Same as above; trace fine gravel, no shells, dense. |
|                |             |     |             | 25/50 for 4"                           |        | SM         | 112.4                 | 8.9                     |                                                                                                                                                                       |
| 20             |             |     |             | 26/50 for 5.5"                         |        | SM         | 111.8                 | 11.1                    |                                                                                                                                                                       |
|                |             |     |             | 31/50 for 4"                           |        | SP         | 97.3                  | 8.1                     |                                                                                                                                                                       |
| 25             |             |     |             |                                        |        |            |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Fine sand with silt; light yellowish-brown; moist; dense                                                                        |
| 30             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                       |
| 35             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                       |
|                |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with native soil and cement mix                                         |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-4**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 12, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                                                  |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                                                       |
| 0              |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                                       |
|                |             |     |             | 17/30/42                               |        | SM         | 107.5                 | 13.5                    | <b>6" Asphalt</b><br><b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; dark yellowish- orange; slightly moist; dense; trace silt; thin laminae of sand lenses. Same as above; some iron oxide staining, medium dense. |
|                |             |     |             | 9/9/15                                 |        | SM         |                       |                         |                                                                                                                                                                                                                       |
|                |             |     |             | 20/34/35                               |        | SM         | 106.6                 | 17.7                    | Same as above; 1.5-inch krotovina with trace glass infill, dense.                                                                                                                                                     |
| 5              |             |     |             | 6/8/9                                  |        | CL         |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Sandy silt; dark yellowish- brown; very stiff; moist; fine sand.                                                                                                                |
|                |             |     |             | 9/15/19                                |        | CL         | 94.2                  | 27.3                    | Same as above; trace clay.                                                                                                                                                                                            |
|                |             |     |             | 4/6/9                                  |        | CL         |                       |                         | Same as above, except stiff.                                                                                                                                                                                          |
| 10             |             |     |             | 14/19/26                               |        | SM         | 100.4                 | 24.2                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; dark yellowish- orange; medium dense; moist; some clayey sand lenses; krotovina. Same as above.                                                                     |
|                |             |     |             | 7/9/15                                 |        | SM         |                       |                         |                                                                                                                                                                                                                       |
| 15             |             |     |             | 16/25/42                               |        | SM         | 111.6                 | 15.2                    | Same as above; krotovina at 15.25-feet with some fine gravel infill, dense                                                                                                                                            |
| 20             |             |     |             | 11/40/50 for 4"                        |        | SM         | 111.1                 | 11.9                    | Same as above; no krotovina; fine sand with silt, very dense.                                                                                                                                                         |
| 25             |             |     |             | 26/50 for 4"                           |        | SM         | 104.4                 | 11.1                    | Same as above, very dense.                                                                                                                                                                                            |
| 30             |             |     |             | 28/50 for 4"                           |        | SM         | 98.9                  | 10.7                    | Same as above, very dense.                                                                                                                                                                                            |
| 35             |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b><br><b>Groundwater Was Not Encountered</b><br>Backfilled with native soil and cement mix                                                                                                 |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-5**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6") | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                 |
|----------------|-------------|-----|-------------|-----------------------------------------|--------|------------|-----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                         |        |            |                       |                         |                                                                                                                                                      |
| 0              |             |     |             | 21/39/38                                |        | SM         | 123.6                 | 7.0                     | <b>ARTIFICIAL FILL (Af):</b> Silty sand; light yellowish brown; dry; dense; fine sand; some asphalt; trace rootlets.<br>Same as above, medium dense. |
|                |             |     |             | 11/6/5                                  |        | SM         |                       |                         |                                                                                                                                                      |
|                |             |     |             | 7/10/10                                 |        | SM         | 101.7                 | 8.0                     |                                                                                                                                                      |
| 5              |             |     |             | 5/6/13                                  |        | SM         |                       |                         |                                                                                                                                                      |
|                |             |     |             | 31/42/45                                |        | SM         | 115.9                 | 8.5                     |                                                                                                                                                      |
|                |             |     |             | 13/16/14                                |        | SM         |                       |                         | Same as above, dense.                                                                                                                                |
| 10             |             |     |             | 20/43/50 for 5"                         |        | SC         | 118.0                 | 8.5                     | <b>ARTIFICIAL FILL (Af):</b> Clayey sand; dark yellowish-brown; moist; very dense; mottled with silty sand.                                          |
|                |             |     |             | 15/12/10                                |        | ML         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Sandy silt with clay; dark brown; very stiff; moist; fine sand.                                                         |
|                |             |     |             | 18/41/44                                |        | ML         | 121.1                 | 10.1                    | Same as above.                                                                                                                                       |
| 15             |             |     |             | 15/14/13                                |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Silty sand; yellowish-brown; medium dense to dense; moist; krotovina infill with clayey sand                            |
|                |             |     |             | 29/50 for 6"                            |        | SM         |                       |                         |                                                                                                                                                      |
|                |             |     |             | 28/50 for 6"                            |        | SM         | 108.5                 | 9.1                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Fine sand with silt; very dense; moist; iron oxide staining.                                                   |
| 20             |             |     |             |                                         |        |            |                       |                         | <b>TOTAL DEPTH: 19.0 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with native soil and cement mix                        |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                      |
| 25             |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                      |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                      |
| 30             |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                      |
| 35             |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                      |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-6**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 12, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                                                                                                                               |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                                                                                                                                    |
| 0              |             |     |             | 15/22/24                               |        | SM         | 112.8                 | 11.4                    | <b>ARTIFICIAL FILL (Af):</b> Silty sand; pale yellowish brown to dark medium brown; slightly moist; medium dense; fine sand; mottled.<br>Same as above.                                                                                                                                            |
|                |             |     |             | 11/8/7                                 |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 14/25/34                               |        | SM         | 104.7                 | 11.6                    |                                                                                                                                                                                                                                                                                                    |
| 5              |             |     |             | 6/9/10                                 |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 13/16/18                               |        | SM         | 107.8                 | 10.7                    |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 4/5/10                                 |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
| 10             |             |     |             | 14/20/28                               |        | SC         | 109.3                 | 12.6                    | Same as above; no krotovina; pocket of clayey silty sand approximately 1.5-inch thick in sampling shoe.<br><b>SOIL:</b> Clayey sand; dark yellowish brown; slightly moist; medium dense; krotovina; trace fine gravel infill in burrow.<br>Same as above, dense.                                   |
|                |             |     |             | 8/7/9                                  |        | SC         |                       |                         |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 14/27/46                               |        | SC         | 119.8                 | 9.4                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; pale yellow-brown; medium dense; slightly moist; trace clay.<br>Same as above, dense.<br>Same as above, medium dense.<br>Same as above; trace iron oxide staining.<br>Same as above; thin sand lenses 1-2mm thick.<br>Same as above, very dense. |
| 15             |             |     |             | 12/13/13                               |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 21/37/41                               |        | SM         | 114.0                 | 8.3                     |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 9/8/16                                 |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
| 20             |             |     |             | 9/15/15                                |        | SM         | 104.6                 | 12.4                    |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 5/6/9                                  |        | SM         |                       |                         |                                                                                                                                                                                                                                                                                                    |
|                |             |     |             | 18/40/50                               |        | SM         | 120.7                 | 7.6                     |                                                                                                                                                                                                                                                                                                    |
| 25             |             |     |             | 22/50 for 6"                           |        | SM/<br>SP  | 118.7                 | 9.3                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Poorly graded sand; dense; slightly moist; some silt.<br>Same as above; some carbon specks.                                                                                                                                                                  |
|                |             |     |             | 18/34/48                               |        | SM/<br>SP  | 105.8                 | 8.6                     |                                                                                                                                                                                                                                                                                                    |
| 30             |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with native soil and cement mix                                                                                                                                                                      |
| 35             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                                                                                                                    |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: B-7**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: CME-75

DRILLING METHOD: 8" Hollow Stem

LOGGED BY: C. Knight

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6") | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                      |
|----------------|-------------|-----|-------------|-----------------------------------------|--------|------------|-----------------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 0              |             |     |             | 8/25/41                                 |        | SM         | 105.3                 | 6.2                     | <b>ARTIFICIAL FILL (Af):</b> Silty sand with gravel; light brown; dense; dry; some roots; fine sand; rounded 3/4-inch gravel<br>Same as above; dense; light yellow brown; slightly moist. |
|                |             |     |             | 17/17/17                                |        | SM         |                       |                         |                                                                                                                                                                                           |
| 5              |             |     |             | 29/44/49                                |        | SM         | 106.4                 | 7.5                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; light yellowish brown; very dense; slightly moist; trace rootlets; krotovina.<br>Same as above, medium dense                            |
|                |             |     |             | 10/9/8                                  |        | SM         |                       |                         |                                                                                                                                                                                           |
|                |             |     |             | 10/17/21                                |        | SM         | 104.4                 | 16.0                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; olive-brown; moist; medium dense; fine sand; iron oxide staining.<br>Same as above.                                                     |
|                |             |     |             | 7/9/11                                  |        | SM         |                       |                         |                                                                                                                                                                                           |
| 10             |             |     |             | 8/30/50 for 5"                          |        | SM         | 112.1                 | 17.8                    | Same as above; very dense; less silt; krotovina.                                                                                                                                          |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 15             |             |     |             | 50 for 5"                               |        | SM         | 98.0                  | 8.9                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; light yellowish-olive brown; moist; very dense; fine sand; little to some silt.                                                         |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 20             |             |     |             | 28/50 for 5"                            |        | SM         | 103.4                 | 10.7                    | Same as above; trace carbon specks.                                                                                                                                                       |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 25             |             |     |             | 29/34/50 for 5"                         |        | SM         | 114.6                 | 11.5                    | Same as above.                                                                                                                                                                            |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 30             |             |     |             | 28/35/50 for 6"                         |        | SM         | 108.1                 | 9.1                     | Same as above.                                                                                                                                                                            |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |
| 35             |             |     |             |                                         |        |            |                       |                         | <b>TOTAL DEPTH: 31.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with native soil and cement mix                                                             |
|                |             |     |             |                                         |        |            |                       |                         |                                                                                                                                                                                           |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: BA-1**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 12, 2013

DRILL RIG: Soil Mechanic R-312-HD

DRILLING METHOD: 24" Bucket Auger

DOWNHOLE LOGGED BY: L. Gurrola

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 0              |             |     |             |                                        |        |            |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Silty sand and clayey silt with little sand; gray brown and brown; dry to slightly moist; very dense sand; stiff silt; and very stiff clayey silt; trace to few fine gravel; chert nodules; few fine roots.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 5              |             |     |             |                                        |        | SM         |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Fine sandy silt to silty sand; yellowish brown; firm to very firm; slightly moist; highly weathered; massive with occasional orange-brown silt laminae 1/16 to 1/4 -inch thick.<br><br><b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; olive brown; moist; dense; fine sand; much silt; iron oxide staining.<br>Same as above.<br><br>Laminae at 12.5-feet composed of orange brown silt (N11E/13NW)<br><br>Same as 7.0-feet above, becomes massive with highly bioturbated structure and worm tube casts at 12.75-feet<br><br>Slightly convoluted silt laminae at 16.5-feet (N38E/15NW).<br><br>Shear at 18.5-feet (N42E/62SE); 1/8-inch wide clay gouge offsets clayey silt laminae approximately 2-inches down to south; silt laminae (N26W/12SW). |
| 10             |             |     |             |                                        |        | SM         | 101.7                 | 14.1                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 15             |             |     |             |                                        |        | SM         | 101.7                 | 6.7                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 20             |             |     |             |                                        |        | SM         | 104.4                 | 8.3                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 25             |             |     |             |                                        |        | SM         | 102.6                 | 13.2                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 30             |             |     |             |                                        |        | CL         | 100.0                 | 10.7                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Grades over 1-foot to gray brown silty sand; slightly moist; minor yellowish brown silt with little sand; load structure; massive exhibiting bioturbation worm tube structures; occasional convoluted silt laminae and pinch and swell syndepositional load structures.<br><br>At 22.0-feet, convoluted laminae (N42E/12NW); shear offsets laminae approximately 1.0-inch down to south (N62E/60SE).<br>At 25.0-feet, pinch and swell laminae (N31E/12NW).                                                                                                                                                                                                                                                                                              |
| 35             |             |     |             |                                        |        |            | 100.4                 | 16.3                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Fine sandy silty clay; moist; very stiff.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 30.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with soil cuttings and tamped with augers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: BA-2**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 12 &amp; 13, 2013

DRILL RIG: Soil Mechanic R-312-HD

DRILLING METHOD: 24" Bucket Auger

DOWNHOLE LOGGED BY: L. Gurrola

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                                       |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                                            |
| 0              |             |     |             |                                        |        | GM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Gravelly silt; brown; dry to slightly moist; trace boulders to 4-inches long; trace concrete debris from 1 to 2-inches diameter; platy structure.                             |
|                |             |     |             |                                        |        | SM         |                       |                         | <b>ARTIFICIAL FILL (Af):</b> Silty sand with trace gravel; yellowish brown; very stiff; slightly moist.                                                                                                    |
| 5              |             |     |             |                                        |        | SM         | 103.9                 | 6.8                     | At 3.75-feet: 1.75-foot high by 0.5-foot wide soft zone extending to 5.5-feet depth.                                                                                                                       |
|                |             |     |             |                                        |        | ML         |                       |                         | Same as above; increase gravel with depth.                                                                                                                                                                 |
| 10             |             |     |             |                                        |        | SM/ML      | 114.2                 | 10.5                    | <b>ARTIFICIAL FILL (Af):</b> Silt and sand with some to little fine gravel; gray-brown; firm to very firm; locally becomes soft; trace chert nodules.                                                      |
|                |             |     |             |                                        |        | CL         |                       |                         | Same as above with 6 to 12-inch long pods of yellow-brown weakly cemented silt clasts.                                                                                                                     |
| 15             |             |     |             |                                        |        | ML         | 110.7                 | 14.5                    | <b>ARTIFICIAL FILL (Af):</b> Grades to very fine sandy silt with some gravel; gray-brown; locally becomes silty sand with some gravel; firm to very firm silt; medium dense to dense sand; slightly moist. |
|                |             |     |             |                                        |        | ML/CL      |                       |                         | Pods of black clay 3 to 5- inches long; stiff; moist.                                                                                                                                                      |
| 20             |             |     |             |                                        |        | SM         | 98.8                  | 8.8                     | <b>ARTIFICIAL FILL (Af):</b> Slightly clayey gravelly silt; dark gray-brown; stiff to very stiff; moist; pods of black clay.                                                                               |
| 25             |             |     |             |                                        |        | ML         | 106.9                 | 13.2                    | <b>SOIL:</b> Silty clay to clayey silt; stiff; moist; trace fine gravel; flat planar contact to soil. Gradational basal contact.                                                                           |
| 30             |             |     |             |                                        |        | SM         | 96.2                  | 10.8                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; yellowish brown; dense; slightly moist to moist; completely weathered; locally soft; occasional krotovina 2 to 5-inches diameter.                        |
| 35             |             |     |             |                                        |        |            |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Silt to slightly sandy silt; moderately weathered; abundant bioturbation structures; massive.                                                                        |
|                |             |     |             |                                        |        |            |                       |                         | <b>SANTA BARBARA FORMATION (Qsb):</b> Silty sand; yellowish-brown; dense; moist; weathered.                                                                                                                |
|                |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 30.5 Feet</b>                                                                                                                                                                              |
|                |             |     |             |                                        |        |            |                       |                         | <b>Groundwater Was Not Encountered</b>                                                                                                                                                                     |
|                |             |     |             |                                        |        |            |                       |                         | Backfilled with soil cuttings and tamped with augers                                                                                                                                                       |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: BA-3**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: Soil Mechanic R-312-HD

DRILLING METHOD: 24" Bucket Auger

DOWNHOLE LOGGED BY: L. Gurrola

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6") | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------|-------------|-----|-------------|-----------------------------------------|--------|------------|-----------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                         |        |            |                       |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0              |             |     |             |                                         |        |            |                       |                         | <b>SONOTUBE:</b> Open 3-inch by 10-inch diameter long burrow exposed at 0.5-feet in depth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5              |             |     |             |                                         |        | ML         | 98.1                  | 6.4                     | <b>COLLUVIUM SOIL (Qoc):</b> Sandy silt with little to some clay; brown; stiff; locally becomes sandy silt with clay; trace fine grained sand.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 10             |             |     |             |                                         |        | ML         | 98.2                  | 8.2                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Very fine sandy silt with few chert nodules; orange-brown; very stiff to locally hard; weak siliceous cementation; minor oxidized limonite coarse sand sized particles form 1/16 to 1/8-inch seams; random orientation; moderately weathered; massive.<br><br>At 8.75-feet: Same as above except little to some chert nodules; highly bioturbated.<br><b>SANTA BARBARA FORMATION (Qsb):</b> Silt with few discontinuous clay seams, gray to pale blue gray; stiff; moist; trace to fossil fragments; massive due to bioturbation with occasional discontinuous laminae; abundant worm tubes; planar bedding contact (N18W/15SW). |
| 15             |             |     |             |                                         |        | ML         | 96.8                  | 25.2                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Slightly clayey silt; pale-green and olive- brown; medium stiff to stiff; slightly moist; trace to few chert nodules; occasional laminae; highly bioturbated with load structures. At 17.0-feet: Same as above: continuous laminae 1/16 to 1/8-inch thick. (N28E/14NW).                                                                                                                                                                                                                                                                                                                                                          |
| 20             |             |     |             |                                         |        | CL         | 100.8                 | 22.3                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Clay continuous; 1/8 to 1/4-inch thick brown seems soft; moist; plastic to highly plastic; slightly greasy; occur within clayey silty laminae (N8E/13NW).                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 25             |             |     |             |                                         |        | SM         | 104.9                 | 16.5                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Silt with few discontinuous clay seams, gray to pale blue gray; stiff; moist; trace to fossil fragments; massive due to bioturbation with occasional discontinuous laminae; abundant worm tubes; planar bedding contact (N18W/15SW).                                                                                                                                                                                                                                                                                                                                                                                             |
| 30             |             |     |             |                                         |        | SM         | 95.1                  | 9.6                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 35             |             |     |             |                                         |        | SM         | 99.3                  | 9.8                     | <b>SANTA BARBARA FORMATION (Qsb):</b> Fossileferous silt and sand; yellow-brown; medium stiff to stiff; moist; many worm tube casts, burrows and other bioturbation structures; weak calcium carbonate sedimentation.<br><br>At 35.0-feet: Same as above with many dewatering structures and load structures; climbing ripples.                                                                                                                                                                                                                                                                                                                                        |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

**BORING NO: BA-3 (Continued)**

PROJECT NAME: Vic Trace Reservoir

PROJECT NUMBER: VT-24831-01

BORING LOCATION: Per Plan

DRILLING DATE: August 14, 2013

DRILL RIG: Soil Mechanic R-312-HD

DRILLING METHOD: 24" Bucket Auger

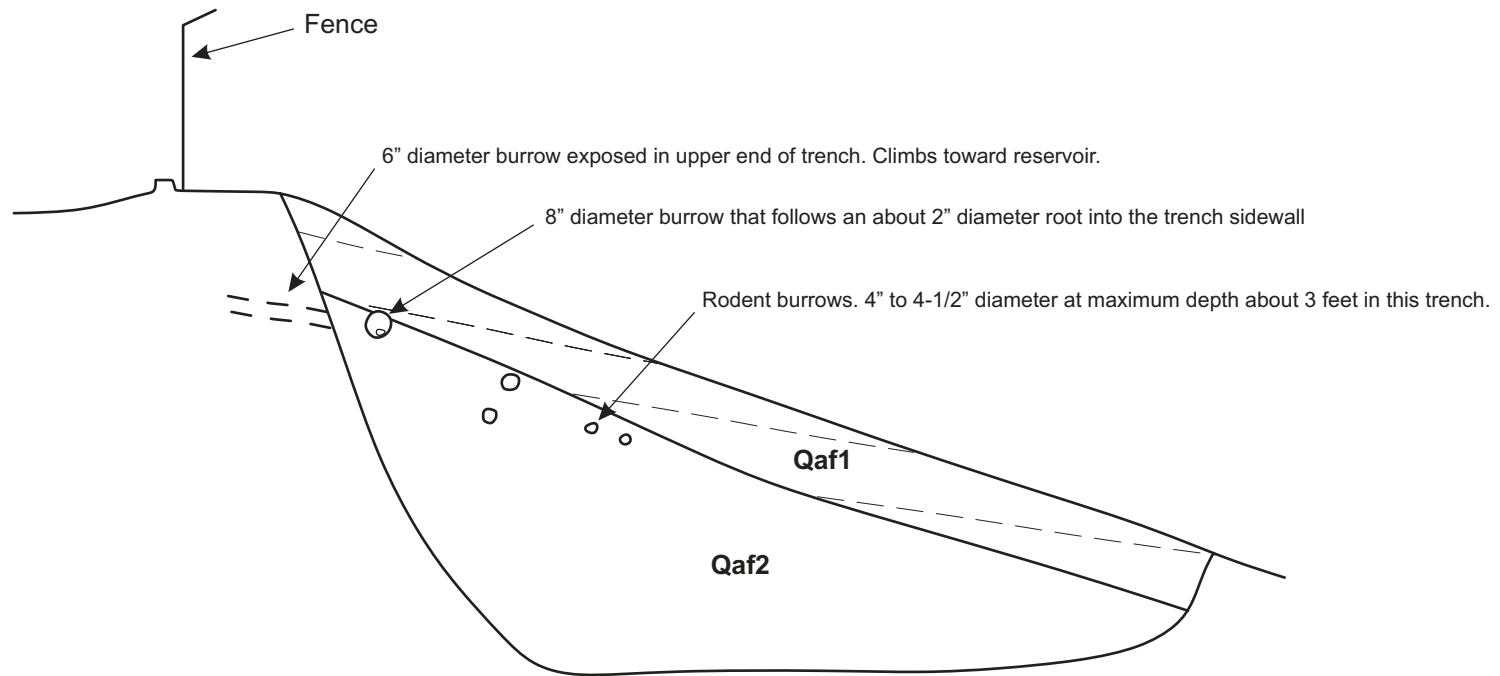
DOWNHOLE LOGGED BY: L. Gurrola

| Vertical Depth | Sample Type |     |             | PENETRATION<br>RESISTANCE<br>(BLOWS/6" | SYMBOL | USCS CLASS | UNIT DRY WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | DESCRIPTION OF UNITS                                                                                                                                                                             |
|----------------|-------------|-----|-------------|----------------------------------------|--------|------------|-----------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Bulk        | SPT | Mod. Calif. |                                        |        |            |                       |                         |                                                                                                                                                                                                  |
| 40             |             |     |             |                                        |        | ML         | 95.3                  | 10.8                    | <b>SANTA BARBARA FORMATION (Qsb):</b> Discontinuous silt laminae approximately 10-inches long by 1-inch thick composed of 1/16 to 1/8-inch thick laminae (N8W/14SW).                             |
| 45             |             |     |             |                                        |        | SM         | 89.7                  | 11.0                    |                                                                                                                                                                                                  |
| 50             |             |     |             |                                        |        | SM         | 93.6                  | 12.4                    | Same as above                                                                                                                                                                                    |
| 55             |             |     |             |                                        |        |            |                       |                         | <b>TOTAL DEPTH: 50.5 Feet</b><br><br><b>Groundwater Was Not Encountered</b><br><br>Backfilled with soil cuttings and tamped with augers<br><br>*Note: Bioturbation obliterates bedding structure |
| 60             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                  |
| 65             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                  |
| 70             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                  |
| 75             |             |     |             |                                        |        |            |                       |                         |                                                                                                                                                                                                  |

Note: The stratification lines shown represent the approximate boundaries between soil and/or rock types and the transitions may be gradual.

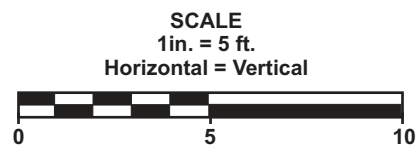
# Backhoe Trench Log T-1

View to Southeast S61W →



**Qaf1** - Artificial fill, thinly layered moderate brown and yellowish brown fine sandy silt, dry, loose in uppermost few inches but otherwise dense. Layering has downslope dip. Appears to be a post-original grading fill.

**Qaf2** - Artificial fill, massive yellowish brown silt to silty very fine sand, dry, dense.



## Backhoe Trench Log

Vic Trace Reservoir  
Santa Barbara, California



**Earth Systems**  
Southern California

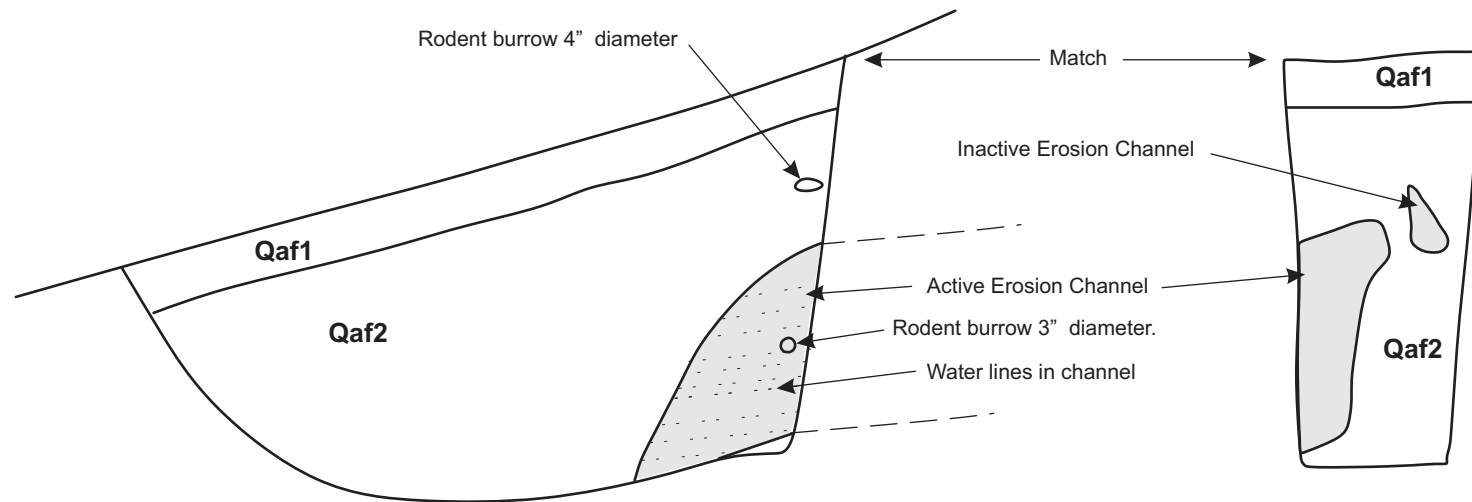
September, 2013

VT-24831-01

# Backhoe Trench Log T-2

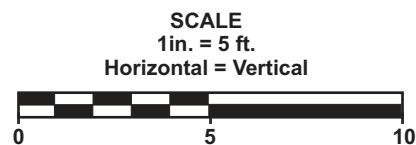
View to Northwest    N52E →

Northeast End of Trench  
View to Northeast



**Qaf1** - Artificial fill, thinly layered moderate brown fine sandy silt, dry, loose in uppermost few inches but otherwise dense.

**Qaf2** - Artificial fill, massive yellowish brown silt to silty very fine sand, dry, dense.



## Backhoe Trench Log

Vic Trace Reservoir  
Santa Barbara, California



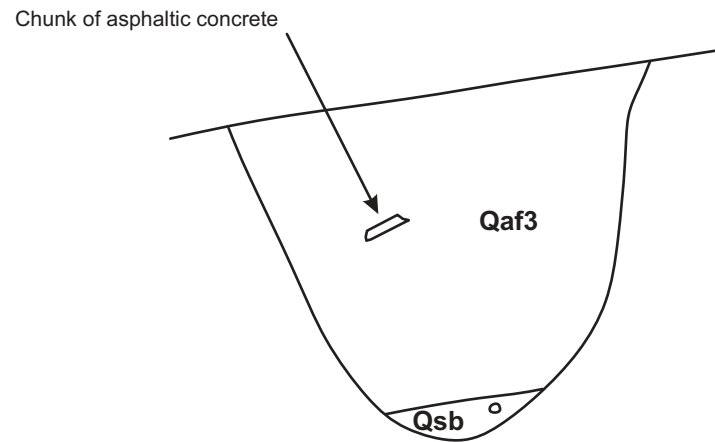
**Earth Systems**  
Southern California

September, 2013

VT-24831-01

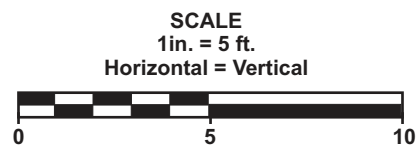
# Backhoe Trench Log T-3

View to Northwest    N55E →



**Qaf3** - Artificial fill, mostly gray brown sandy silt with a minor amount of dark brown silty clay, moist, loose to medium dense.  
Some chunks of asphaltic concrete.

**Qsb** - Santa Barbara Formation, orangish brown sandy silt with some cobble.



## Backhoe Trench Log

Vic Trace Reservoir  
Santa Barbara, California



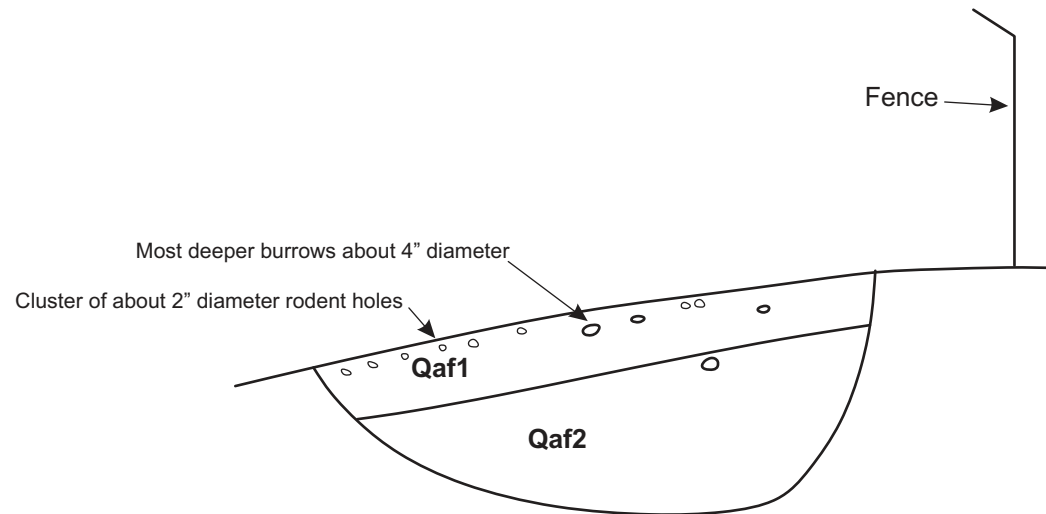
**Earth Systems**  
Southern California

September, 2013

VT-24831-01

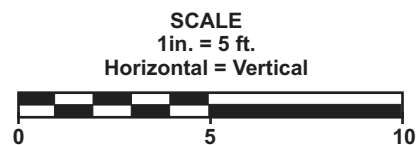
# Backhoe Trench Log T-4

View to Northwest    N61E →



**Qaf1** - Artificial fill, moderate brown fine sandy silt, dry, loose in uppermost few inches but otherwise dense. Has clusters of about 2" diameter rodent burrows just below the surface.

**Qaf2** - Artificial fill, massive yellowish brown silt to silty very fine sand, dry, dense.



## Backhoe Trench Log

Vic Trace Reservoir  
Santa Barbara, California



**Earth Systems**  
Southern California

September, 2013

VT-24831-01

## SYMBOLS COMMONLY USED ON BORING LOGS



Modified California Split Barrel Sampler



Modified California Split Barrel Sampler - No Recovery



Standard Penetration Test (SPT) Sampler



Standard Penetration Test (SPT) Sampler - No Recovery



Perched Water Level



Water Level First Encountered



Water Level After Drilling



Pocket Penetrometer (tsf)



Vane Shear (ksf)

1. The location of borings were approximately determined by pacing and/or siting from visible features. Elevations of borings are approximately determined by interpolating between plan contours. The location and elevation of the borings should be considered
2. The stratification lines represent the approximate boundary between soil types and the transition may be gradual.
3. Water level readings have been made in the drill holes at times and under conditions stated on the boring logs. This data has been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, tides, temperature, and other factors at the time measurements were made.

|                                                                                       |                                                    |
|---------------------------------------------------------------------------------------|----------------------------------------------------|
| BORING LOG SYMBOLS                                                                    |                                                    |
|                                                                                       |                                                    |
|  | <b>Earth Systems</b><br><b>Southern California</b> |
|                                                                                       |                                                    |



**Earth Systems**  
**Southern California**

| MAJOR DIVISIONS                                                                         |                           |                                                  | GRAPH SYMBOL | LETTER SYMBOL | TYPICAL DESCRIPTIONS                                                                                               |
|-----------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------|--------------|---------------|--------------------------------------------------------------------------------------------------------------------|
| COARSE GRAINED SOILS<br><br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS (LITTLE OR NO FINES)               |              | GW            | WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES                                                      |
|                                                                                         |                           |                                                  |              | GP            | POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES                                                    |
|                                                                                         |                           | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) |              | GM            | SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES                                                                           |
|                                                                                         |                           |                                                  |              | GC            | CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES                                                                          |
|                                                                                         | SAND AND SANDY SOILS      | CLEAN SAND (LITTLE OR NO FINES)                  |              | SW            | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES                                                              |
|                                                                                         |                           |                                                  |              | SP            | POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES                                                            |
|                                                                                         |                           | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)   |              | SM            | SILTY SANDS, SAND-SILT MIXTURES                                                                                    |
|                                                                                         |                           |                                                  |              | SC            | CLAYEY SANDS, SAND-CLAY MIXTURES                                                                                   |
| FINE GRAINED SOILS<br><br>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE  | SILTS AND CLAYS           | LIQUID LIMIT <u>LESS</u> THAN 50                 |              | ML            | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
|                                                                                         |                           |                                                  |              | CL            | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS                  |
|                                                                                         |                           |                                                  |              | OL            | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY                                                            |
|                                                                                         | SILTS AND CLAYS           | LIQUID LIMIT <u>GREATER</u> THAN 50              |              | MH            | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS                                                |
|                                                                                         |                           |                                                  |              | CH            | INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS                                                                      |
|                                                                                         |                           |                                                  |              | OH            | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS                                                          |
| HIGHLY ORGANIC SOILS                                                                    |                           |                                                  |              | PT            | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENT                                                                 |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

#### UNIFIED SOIL CLASSIFICATION SYSTEM



**Earth Systems**  
**Southern California**

## PROJECT PHOTOGRAPHS



**Photo No. 1**



**Photo No. 2**

## PROJECT PHOTOGRAPHS



**Photo No. 3**



**Photo No. 4**

## PROJECT PHOTOGRAPHS



**Photo No. 5**



**Photo No. 6**

## **APPENDIX B**

Laboratory Testing

Tabulated Laboratory Test Results

Individual Laboratory Test Results

Scatter Diagrams of Direct Shear Data

Table 1809.7(1) (Expansion Ranges Table)

## LABORATORY TESTING

- A. Samples were reviewed along with field logs to determine which would be analyzed further. Those chosen for laboratory analysis were considered representative of soils that would potentially be exposed and/or used during grading, and those deemed to be within the influence of the reservoir and related structures. Test results are presented in graphic and tabular form in this Appendix.
- B. In-situ Moisture Content and Unit Dry Weight for the ring samples were determined in general accordance with ASTM D 2937.
- C. The relative strength characteristics of soils were determined from the results of Direct Shear tests on remolded samples. Specimens were placed in contact with water at least 24 hours before testing. Relatively undisturbed samples were sheared under normal loads ranging from 1 to 3 ksf in general accordance with ASTM D 3080. Remolded samples were sheared under normal loads ranging from 0.25 to 3 ksf.
- D. Settlement characteristics were developed from the results of a one dimensional consolidation test performed in general accordance with ASTM D 2435. The sample was loaded to 0.125 ksf, flooded with water, and then incrementally loaded to 0.25, 0.5, 1.0, 2.0, 4.0, 8.0, and 16.0 ksf. The sample was allowed to consolidate under each load increment. Rebound was measured under reverse alternate loading. Compression was measured by dial gauges accurate to 0.0001 inch. Results of the consolidation test are presented in this Appendix as a percent consolidation versus log of pressure curve.
- E. Expansion index tests were performed on bulk soil samples in accordance with ASTM D 4829. The samples were surcharged under 144 pounds per square foot at moisture content of near 50 percent saturation. Samples were then submerged in water for 24 hours and the amount of expansion was recorded with a dial indicator.
- F. Maximum density tests were performed to estimate the moisture-density relationship of typical soil materials. The tests were performed in accordance with ASTM D 1557.
- G. The gradation characteristics of selected samples were evaluated by hydrometer (in accordance with ASTM D 422) and sieve analysis procedures. Selected samples were soaked in water until individual soil particles were separated, then washed on the No. 200 mesh sieve, oven dried, weighed to calculate the percent passing the No. 200 sieve, and mechanically sieved. Additionally, hydrometer analyses were performed to assess the distribution of the minus No. 200 mesh material of the samples. The hydrometer portions of the tests were run using sodium hexametaphosphate as a dispersing agent.
- H. Resistance ("R") Value tests were conducted on bulk samples secured during the field study. The tests were performed in accordance with California Method 301. Three specimens at different moisture contents were tested for each sample, and the R-Value at 300 psi exudation pressure was determined from the plotted results.

### **LABORATORY TESTING (Continued)**

- I. Portions of the bulk samples were sent to another laboratory for analyses of soil pH, resistivity, chloride contents, and sulfate contents. Soluble chloride and sulfate contents were determined on a dry weight basis. Resistivity testing was performed in accordance with California Test Method 424, wherein the ratio of soil to water was 1:3.
- J. The Plasticity Indices of selected samples were evaluated in accordance with ASTM D 4318.

## TABULATED LABORATORY TEST RESULTS

### REMOLEDDED SAMPLES

|                            |            |            |            |
|----------------------------|------------|------------|------------|
| BORING AND DEPTH           | B-1 @ 1-5' | B-2 @ 1-5' | B-4 @ 1-5' |
| USCS                       | SM         | SM         | ML         |
| MAXIMUM DENSITY (pcf)      | 122.5      | 122.5      | 117.0      |
| OPTIMUM MOISTURE (%)       | 11.0       | 10.0       | 12.0       |
| COHESION (psf)             | 40* 30**   | 10* 0**    | 0* 0**     |
| ANGLE OF INTERNAL FRICTION | 31°* 31°*  | 32°* 32°** | 34°* 34°** |
| EXPANSION INDEX            | 22         | 32         | 16         |
| pH                         | 6.5        | 5.3        | 6.7        |
| SOLUBLE CHLORIDES (mg/Kg)  | 170        | 130        | 9          |
| RESISTIVITY (OHMs-cm)      | 3,000      | 1,800      | 4,900      |
| SOLUBLE SULFATES (mg/Kg)   | 130        | 46         | 19         |

### RELATIVELY UNDISTURBED SAMPLES

|                            |            |            |            |
|----------------------------|------------|------------|------------|
| BORING AND DEPTH           | B-1 @ 4'   | B-1 @ 10'  | B-2 @ 7'   |
| IDENTIFICATION             | Ex. Fill   | Ex. Fill   | Ex. Fill   |
| USCS                       | SM         | SM         | SC         |
| IN-PLACE DENSITY (pcf)     | 104.8      | 116.8      | 118.2      |
| IN-PLACE MOISTURE (%)      | 9.9        | 9.7        | 10.1       |
| COHESION (psf)             | 280* 70**  | 40* 0**    | 0* 0**     |
| ANGLE OF INTERNAL FRICTION | 29°* 31°** | 43°* 34°** | 54°* 38°** |

\* = Peak Strength Parameters

\*\* = Ultimate Strength Parameters

## TABULATED LABORATORY TEST RESULTS (Continued)

### RELATIVELY UNDISTURBED SAMPLES

| BORING AND DEPTH            | B-3 @ 13' |       | B-3 @ 25' |       | B-4 @ 7' |       |
|-----------------------------|-----------|-------|-----------|-------|----------|-------|
| IDENTIFICATION              | Qsb       |       | Qsb       |       | Qsb      |       |
| USCS                        | CL        |       | SM        |       | CL       |       |
| IN-PLACE DENSITY (pcf)      | 112.1     |       | 111.8     |       | 94.2     |       |
| IN-PLACE MOISTURE (%)       | 16.4      |       | 11.1      |       | 27.3     |       |
| LIQUID LIMIT                | 39        |       | --        |       | 50       |       |
| PLASTIC LIMIT               | 19        |       | --        |       | 18       |       |
| PLASTICITY INDEX            | 20        |       | --        |       | 32       |       |
| COHESION (psf)              | 920*      | 140** | 120*      | 340** | 950*     | 320** |
| ANGLE OF INTERNAL FRICTION  | 33°*      | 37°** | 39°*      | 28°** | 19°*     | 23°** |
| GRAIN SIZE DISTRIBUTION (%) |           |       |           |       |          |       |
| GRAVEL                      | 0.0       |       | --        |       | 0.0      |       |
| SAND                        | 15.7      |       | --        |       | 13.7     |       |
| SILT                        | 54.1      |       | --        |       | 49.0     |       |
| CLAY (2µm to 5µm)           | 7.0       |       | --        |       | 8.8      |       |
| CLAY (≤2µm)                 | 23.2      |       | --        |       | 28.5     |       |

| BORING AND DEPTH           | B-4 @ 20' |       | B-6 @ 7' |       | BA-1 @ 10' |       |
|----------------------------|-----------|-------|----------|-------|------------|-------|
| IDENTIFICATION             | Qsb       |       | Ex. Fill |       | Qsb        |       |
| USCS                       | SM        |       | SM       |       | SM         |       |
| IN-PLACE DENSITY (pcf)     | 111.1     |       | 107.8    |       | 101.7      |       |
| IN-PLACE MOISTURE (%)      | 11.9      |       | 10.7     |       | 6.7        |       |
| COHESION (psf)             | 690*      | 0**   | 320*     | 0**   | 160*       | 120** |
| ANGLE OF INTERNAL FRICTION | 34°*      | 34°** | 29°*     | 33°** | 30°*       | 30°** |

\* = Peak Strength Parameters

\*\* = Ultimate Strength Parameters

## TABULATED LABORATORY TEST RESULTS (Continued)

|                             | <u>RELATIVELY UNDISTURBED SAMPLES</u> |       |            |            |            |       |
|-----------------------------|---------------------------------------|-------|------------|------------|------------|-------|
| BORING AND DEPTH            | BA-1 @ 25'                            |       |            | BA-1 @ 30' |            |       |
| IDENTIFICATION              | Qsb                                   |       |            | Qsb        |            |       |
| USCS                        | SM                                    |       |            | CL         |            |       |
| IN-PLACE DENSITY (pcf)      | 100.0                                 |       |            | 104.4      |            |       |
| IN-PLACE MOISTURE (%)       | 10.7                                  |       |            | 16.3       |            |       |
| LIQUID LIMIT                | --                                    |       |            | 34         |            |       |
| PLASTIC LIMIT               | --                                    |       |            | 22         |            |       |
| PLASTICITY INDEX            | --                                    |       |            | 12         |            |       |
| COHESION (psf)              | 40*                                   | 0**   |            | 580*       | 160**      |       |
| ANGLE OF INTERNAL FRICTION  | 32°*                                  | 32°** |            | 30°*       | 31°**      |       |
| GRAIN SIZE DISTRIBUTION (%) |                                       |       |            |            |            |       |
| GRAVEL                      | --                                    |       |            | 0.0        |            |       |
| SAND                        | --                                    |       |            | 18.3       |            |       |
| SILT                        | --                                    |       |            | 58.7       |            |       |
| CLAY (2µm to 5µm)           | --                                    |       |            | 3.5        |            |       |
| CLAY (≤2µm)                 | --                                    |       |            | 19.5       |            |       |
|                             |                                       |       |            |            |            |       |
| BORING AND DEPTH            | BA-2 @ 25'                            |       | BA-2 @ 30' |            | BA-3 @ 20' |       |
| IDENTIFICATION              | Qsb                                   |       | Qsb        |            | Qsb        |       |
| USCS                        | ML                                    |       | SM         |            | CL         |       |
| IN-PLACE DENSITY (pcf)      | 106.9                                 |       | 96.2       |            | 100.8      |       |
| IN-PLACE MOISTURE (%)       | 13.2                                  |       | 10.8       |            | 22.3       |       |
| LIQUID LIMIT                | --                                    |       | --         |            | 46         |       |
| PLASTIC LIMIT               | --                                    |       | --         |            | 20         |       |
| PLASTICITY INDEX            | --                                    |       | --         |            | 26         |       |
| COHESION (psf)              | 740*                                  | 0**   | 600*       | 430**      | 0*         | 90**  |
| ANGLE OF INTERNAL FRICTION  | 27°*                                  | 32°** | 26°*       | 28°**      | 45°*       | 30°** |
| GRAIN SIZE DISTRIBUTION (%) |                                       |       |            |            |            |       |
| GRAVEL                      | --                                    |       | --         |            | 0.0        |       |
| SAND                        | --                                    |       | --         |            | 12.1       |       |
| SILT                        | --                                    |       | --         |            | 53.8       |       |
| CLAY (2µm to 5µm)           | --                                    |       | --         |            | 8.4        |       |
| CLAY (≤2µm)                 | --                                    |       | --         |            | 25.7       |       |

\* = Peak Strength Parameters; \*\* = Ultimate Strength Parameters

# TABULATED LABORATORY TEST RESULTS (Continued)

## IN-PLACE DENSITIES

| <u>BORING &amp; DEPTH</u> |     | <u>DRY DENSITY</u> | <u>% MOISTURE</u> | <u>RELATIVE<br/>COMPACTION</u> |
|---------------------------|-----|--------------------|-------------------|--------------------------------|
| B-1 @                     | 1'  | 116.8              | 10.8              | 95                             |
|                           | 4'  | 104.8              | 9.9               | 86                             |
|                           | 7'  | 114.7              | 11.4              | 94                             |
|                           | 10' | 116.8              | 9.7               | 95                             |
|                           | 13' | 117.6              | 11.6              | 96                             |
|                           | 16' | 106.2              | 6.2               | --                             |
|                           | 19' | 109.1              | 9.1               | --                             |
|                           | 20' | 98.5               | 22.8              | --                             |
|                           | 25' | 110.4              | 15.2              | --                             |
|                           | 30' | 110.6              | 8.2               | --                             |
| B-2 @                     | 1'  | 105.8              | 7.0               | 86                             |
|                           | 4'  | 111.4              | 8.0               | 91                             |
|                           | 7'  | 118.2              | 10.1              | --                             |
|                           | 11' | 123.8              | 10.4              | --                             |
|                           | 15' | 123.0              | 1.7               | --                             |
|                           | 20' | 118.9              | 6.7               | --                             |
|                           | 25' | 104.9              | 3.8               | --                             |
|                           | 30' | 107.5              | 8.0               | --                             |
| B-3 @                     | 1'  | 109.6              | 7.8               | 89                             |
|                           | 4'  | 105.1              | 9.2               | 86                             |
|                           | 7'  | 105.7              | 15.7              | --                             |
|                           | 10' | 101.3              | 23.2              | --                             |
|                           | 13' | 112.1              | 16.4              | --                             |
|                           | 20' | 112.4              | 8.9               | --                             |
|                           | 25' | 111.8              | 11.1              | --                             |
|                           | 30' | 97.3               | 8.1               | --                             |
| B-4 @                     | 1'  | 107.5              | 13.5              | 88                             |
|                           | 4'  | 106.6              | 17.7              | 87                             |
|                           | 7'  | 94.2               | 27.3              | --                             |
|                           | 10' | 100.4              | 24.2              | --                             |
|                           | 15' | 111.6              | 15.2              | --                             |
|                           | 20' | 111.1              | 11.9              | --                             |
|                           | 25' | 104.4              | 11.1              | --                             |
|                           | 30' | 98.9               | 10.7              | --                             |

# TABULATED LABORATORY TEST RESULTS (Continued)

## IN-PLACE DENSITIES

| <u>BORING &amp; DEPTH</u> |     | <u>DRY DENSITY</u> | <u>% MOISTURE</u> | <u>RELATIVE COMPACTION</u> |
|---------------------------|-----|--------------------|-------------------|----------------------------|
| B-5 @                     | 1'  | 123.6              | 7.0               | 101                        |
|                           | 4'  | 101.7              | 8.0               | 83                         |
|                           | 7'  | 115.9              | 8.5               | 95                         |
|                           | 10' | 118.0              | 8.5               | --                         |
|                           | 13' | 121.1              | 10.1              | --                         |
|                           | 16' | 108.5              | 9.1               | --                         |
| B-6 @                     | 1'  | 112.8              | 11.4              | 92                         |
|                           | 4'  | 104.7              | 11.6              | 85                         |
|                           | 7'  | 107.8              | 10.7              | 88                         |
|                           | 10' | 109.3              | 12.6              | 89                         |
|                           | 13' | 119.8              | 9.4               | --                         |
|                           | 16' | 114.0              | 8.3               | --                         |
|                           | 19' | 104.6              | 12.4              | --                         |
|                           | 22' | 120.7              | 7.6               | --                         |
|                           | 25' | 118.7              | 9.3               | --                         |
|                           | 30' | 105.8              | 8.6               | --                         |
| B-7 @                     | 1'  | 105.3              | 6.2               | --                         |
|                           | 4'  | 106.4              | 7.5               | --                         |
|                           | 7'  | 104.4              | 16.0              | --                         |
|                           | 10' | 112.1              | 17.8              | --                         |
|                           | 15' | 98.0               | 8.9               | --                         |
|                           | 20' | 103.4              | 10.7              | --                         |
|                           | 25' | 114.6              | 11.5              | --                         |
|                           | 30' | 108.1              | 9.1               | --                         |
| BA-1 @                    | 5'  | 101.7              | 14.1              | --                         |
|                           | 10' | 101.7              | 6.7               | --                         |
|                           | 15' | 104.4              | 8.3               | --                         |
|                           | 20' | 102.6              | 13.2              | --                         |
|                           | 25' | 100.0              | 10.7              | --                         |
|                           | 30' | 104.4              | 16.3              | --                         |

**TABULATED LABORATORY TEST RESULTS (Continued)****IN-PLACE DENSITIES**

| <b><u>BORING &amp; DEPTH</u></b> | <b><u>DRY DENSITY</u></b> | <b><u>% MOISTURE</u></b> | <b><u>RELATIVE<br/>COMPACTION</u></b> |
|----------------------------------|---------------------------|--------------------------|---------------------------------------|
| BA-2 @ 5'                        | 103.9                     | 6.8                      | 85                                    |
| 10'                              | 114.2                     | 10.5                     | 93                                    |
| 15'                              | 110.7                     | 14.5                     | 90                                    |
| 20'                              | 98.8                      | 8.8                      | --                                    |
| 25'                              | 106.9                     | 13.2                     | --                                    |
| 30'                              | 96.2                      | 10.8                     | --                                    |
| BA-3 @ 5'                        | 98.1                      | 6.4                      | --                                    |
| 10'                              | 98.2                      | 8.2                      | --                                    |
| 15'                              | 96.8                      | 25.2                     | --                                    |
| 20'                              | 100.8                     | 22.3                     | --                                    |
| 25'                              | 104.9                     | 16.5                     | --                                    |
| 30'                              | 95.1                      | 9.6                      | --                                    |
| 35'                              | 99.3                      | 9.8                      | --                                    |
| 40'                              | 95.3                      | 10.8                     | --                                    |
| 45'                              | 89.7                      | 11.0                     | --                                    |
| 50'                              | 93.6                      | 12.4                     | --                                    |

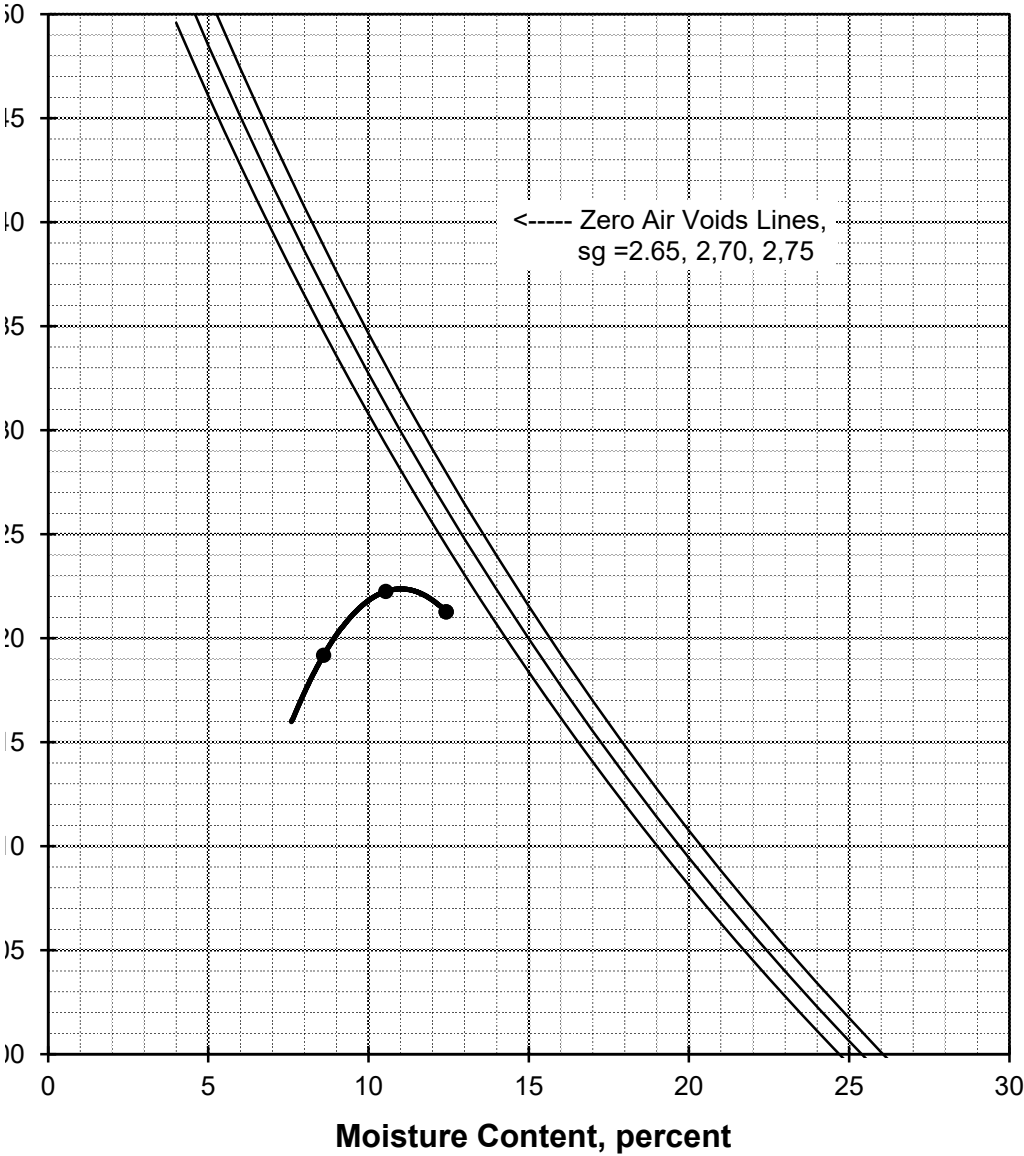
**MAXIMUM DENSITY / OPTIMUM MOISTURE**

ASTM D 1557-07 (Modified)

Job Name: Vic Trace Reservoir  
Sample ID: B 1 @ 1'-5'  
Location: 1'-5'  
Description: Yellowish Brown Silty Sand

Procedure Used: A  
Prep. Method: Moist  
Rammer Type: Automatic

|                   |           | Sieve Size | % Retained |
|-------------------|-----------|------------|------------|
| Maximum Density:  | 122.5 pcf | 3/4"       | 0.0        |
| Optimum Moisture: | 11%       | 3/8"       | 0.0        |
|                   |           | #4         | 0.5        |



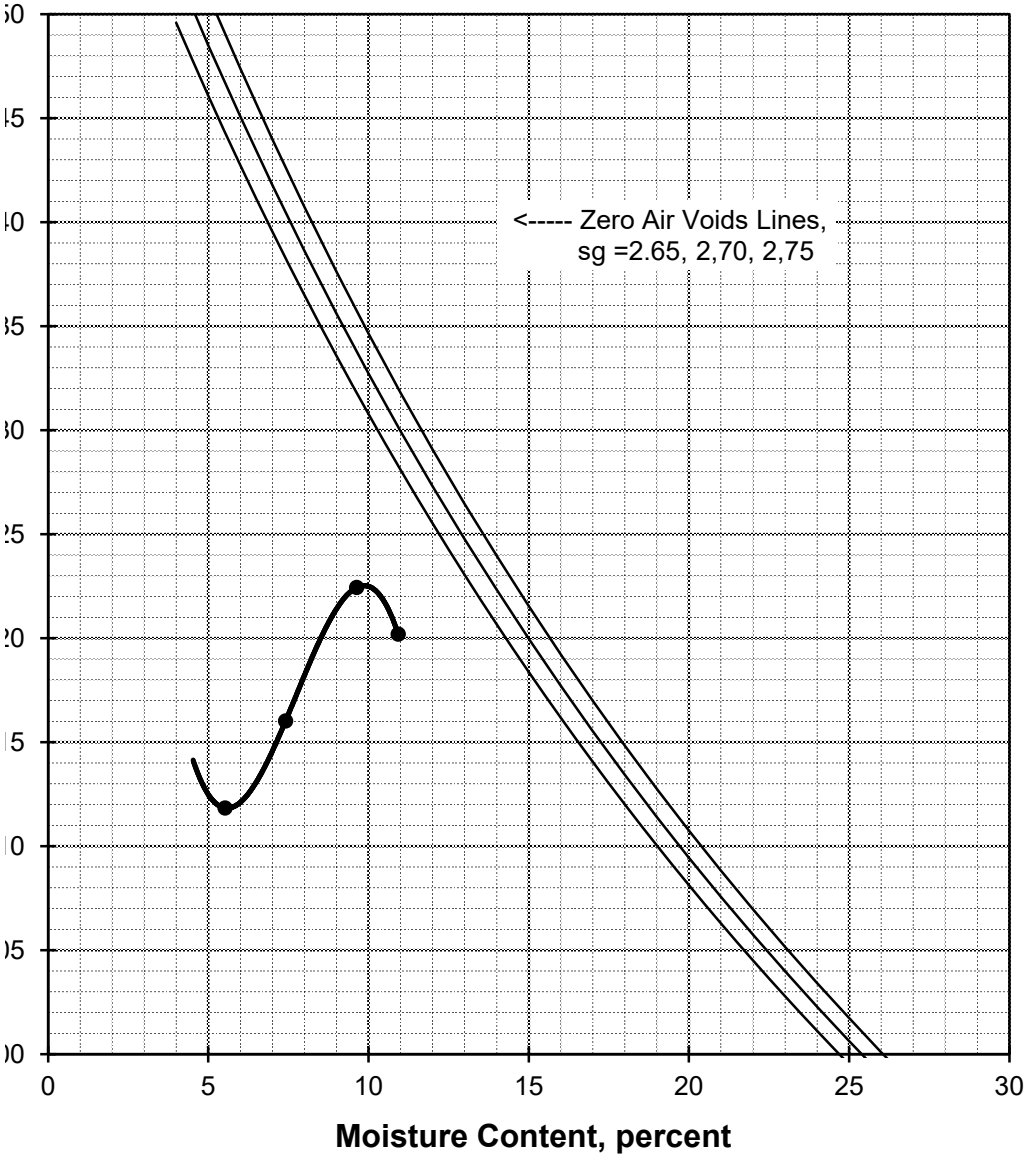
**MAXIMUM DENSITY / OPTIMUM MOISTURE**

ASTM D 1557-07 (Modified)

Job Name: Vic Trace Reservoir  
Sample ID: B 2 @ 1'-5'  
Location: 1'-5'  
Description: Yellowish Brown Silty Sand

Procedure Used: A  
Prep. Method: Moist  
Rammer Type: Automatic

|                   |           | Sieve Size | % Retained |
|-------------------|-----------|------------|------------|
| Maximum Density:  | 122.5 pcf | 3/4"       | 0.0        |
| Optimum Moisture: | 10%       | 3/8"       | 0.0        |
|                   |           | #4         | 0.4        |



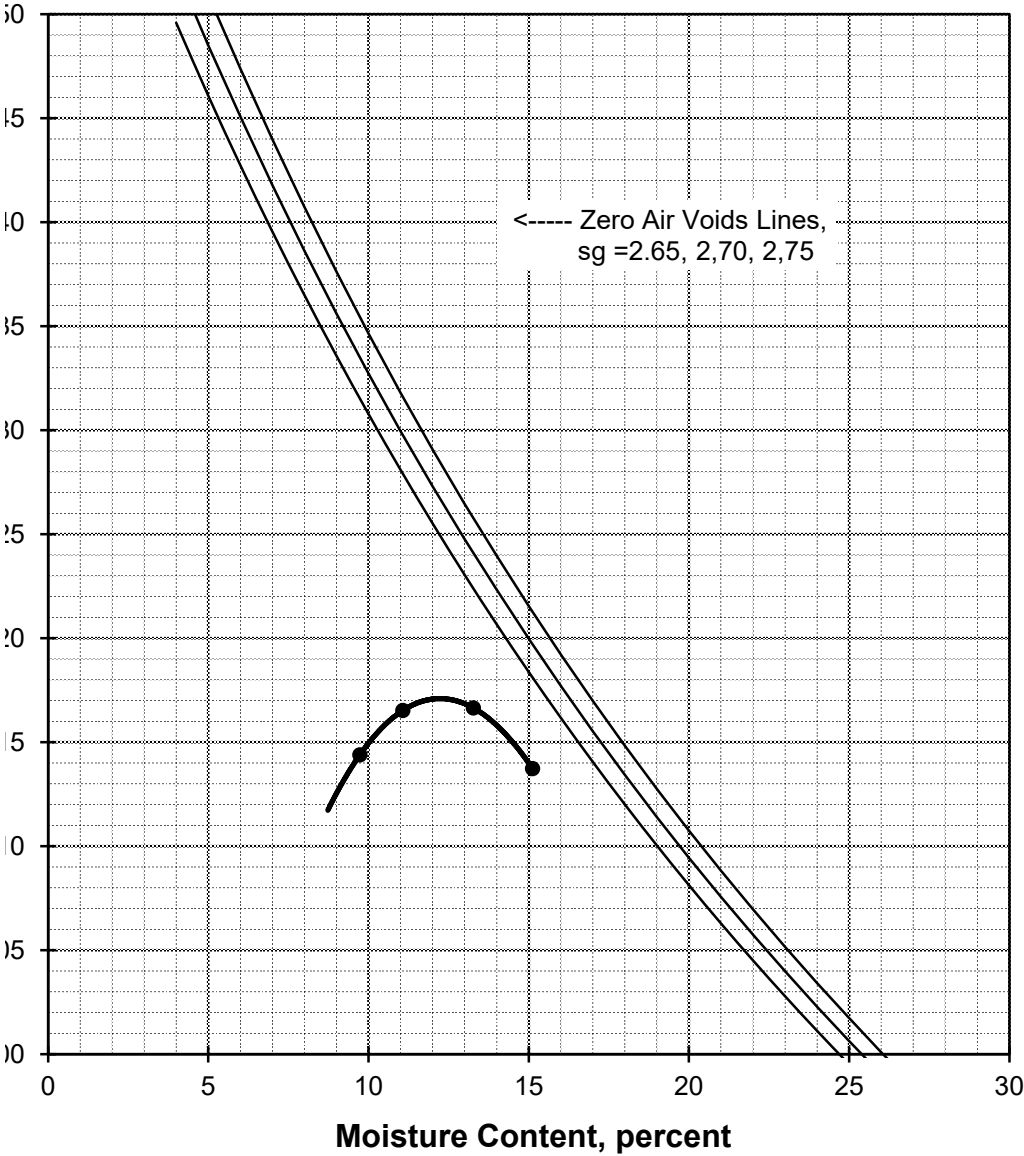
**MAXIMUM DENSITY / OPTIMUM MOISTURE**

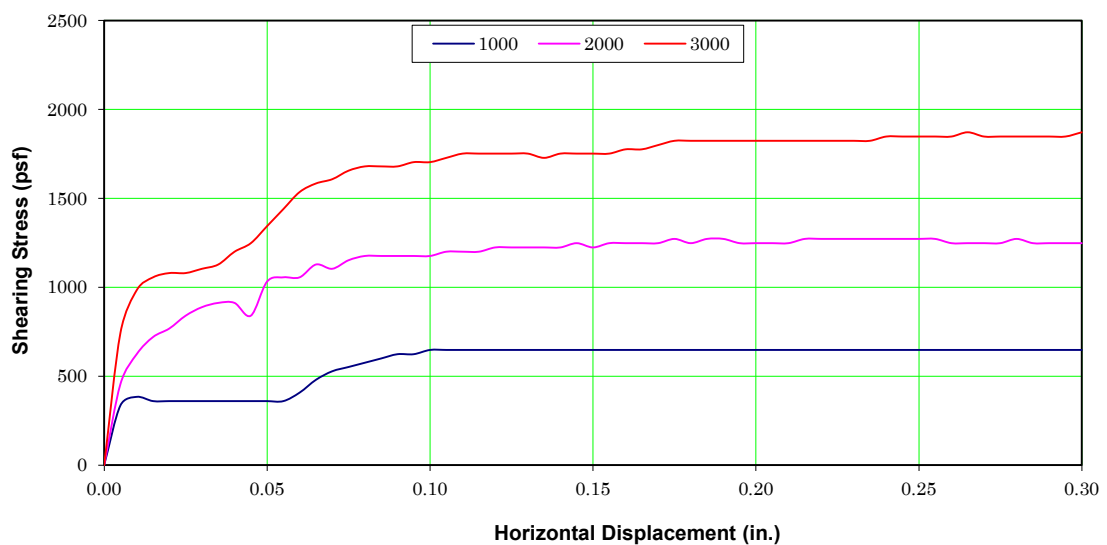
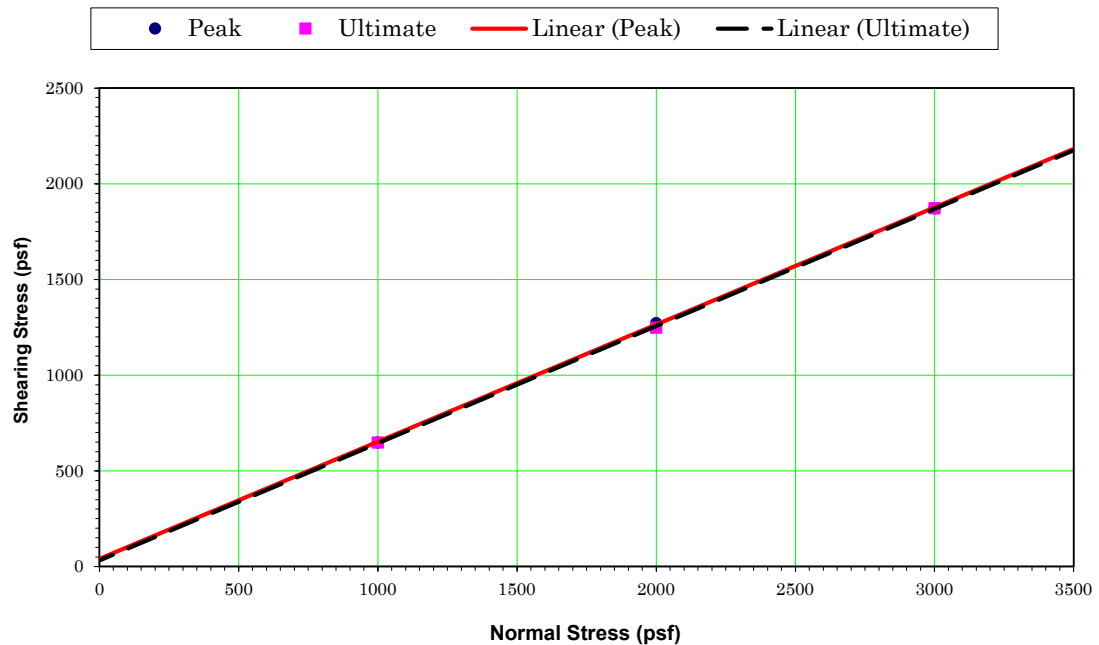
ASTM D 1557-07 (Modified)

Job Name: Vic Trace Reservoir  
Sample ID: B 4 @ 1'-5'  
Location: 1'-5'  
Description: Brownish Yellow Trace Clay Sandy Silt

Procedure Used: A  
Prep. Method: Moist  
Rammer Type: Automatic

|                          |                |                   |                   |
|--------------------------|----------------|-------------------|-------------------|
|                          |                | <u>Sieve Size</u> | <u>% Retained</u> |
| <b>Maximum Density:</b>  | <b>117 pcf</b> | 3/4"              | 0.0               |
| <b>Optimum Moisture:</b> | <b>12%</b>     | 3/8"              | 0.0               |
|                          |                | #4                | 0.8               |





#### DIRECT SHEAR DATA\*

Sample Location: B 1 @ 1'-5'  
 Sample Description: Silty Sand  
 Dry Density (pcf): 109.7  
 Initial % Moisture: 11  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0059 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 648  | 1272 | 1872 |
| Ultimate stress (psf) | 648  | 1248 | 1872 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 31   | 31       |
| c Cohesive Strength (psf):          | 40   | 30       |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

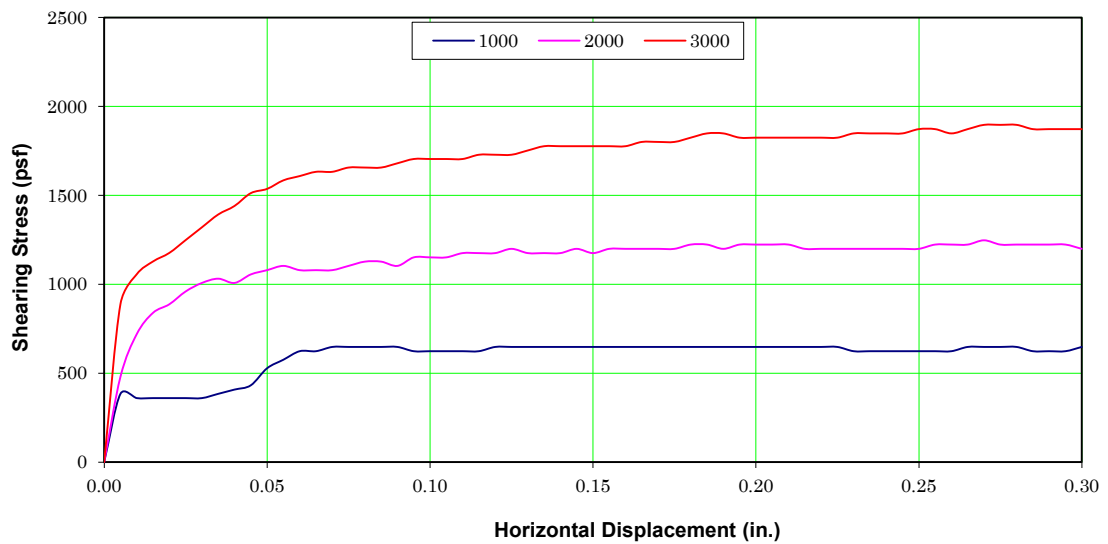
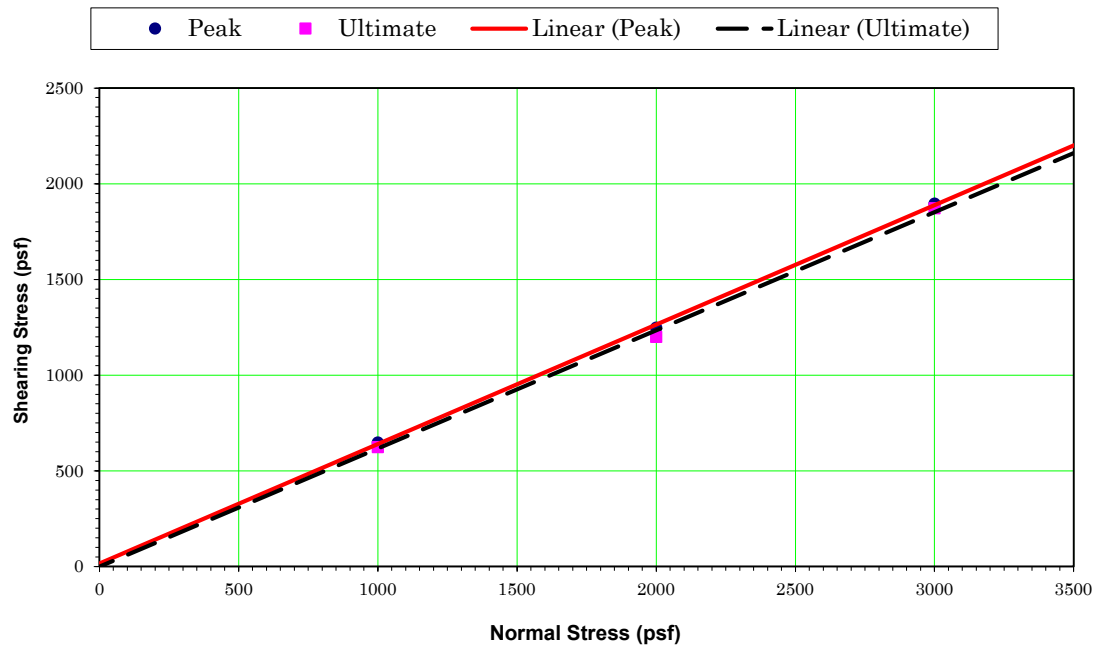
**Vic Trace Reservoir**



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VT-24831-01



#### DIRECT SHEAR DATA\*

Sample Location: B 2 @ 1'-5'  
 Sample Description: Silty Sand  
 Dry Density (pcf): 109.9  
 Initial % Moisture: 10  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0042 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 648  | 1248 | 1896 |
| Ultimate stress (psf) | 624  | 1200 | 1872 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 32   | 32       |
| c Cohesive Strength (psf):          | 10   | 0        |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

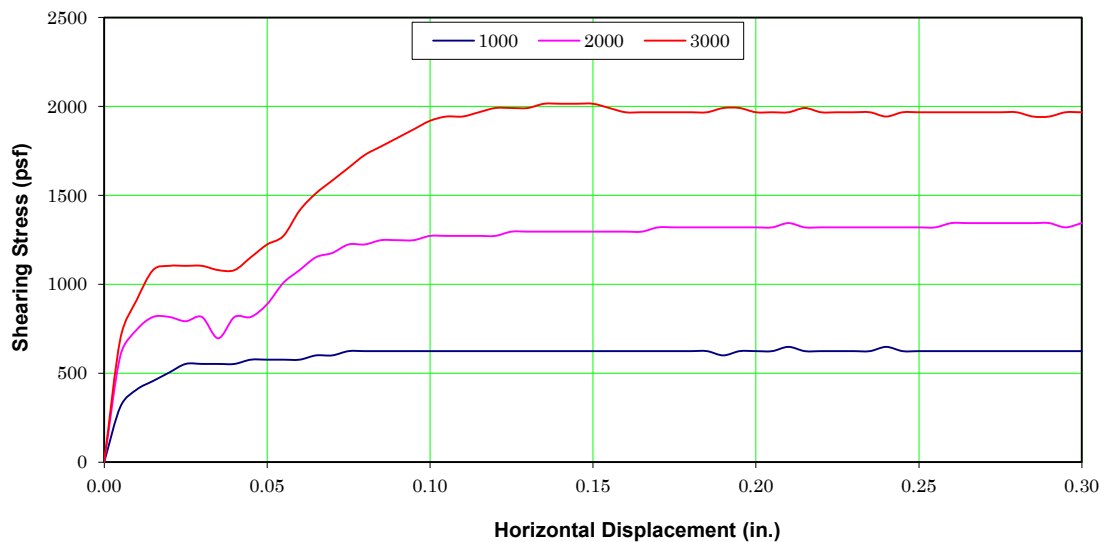
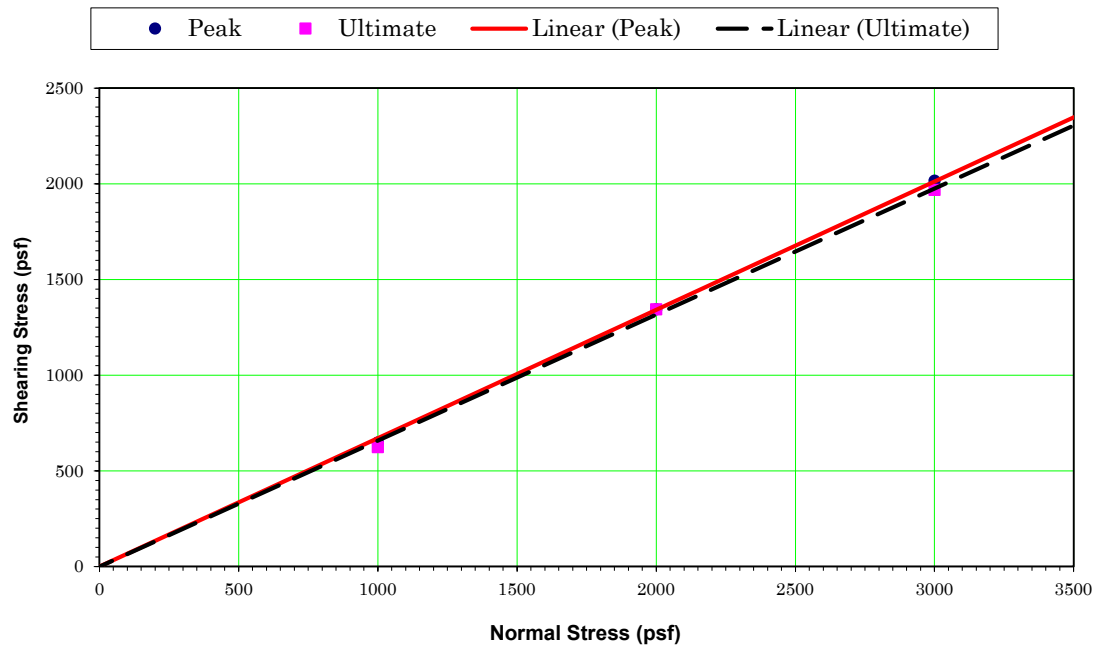
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 4 @ 1'-5'  
 Sample Description: Sandy Silt  
 Dry Density (pcf): 104.7  
 Initial % Moisture: 12.2  
 Average Degree of Saturation: 94.5  
 Shear Rate (in/min): 0.0061 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 1000     | 2000 | 3000 |
|                                     | Peak stress (psf)     | 648      | 1344 | 2016 |
|                                     | Ultimate stress (psf) | 624      | 1344 | 1968 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 34                    | 34       |      |      |
| c Cohesive Strength (psf):          | 0                     | 0        |      |      |
| Test Type: Peak & Ultimate          |                       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

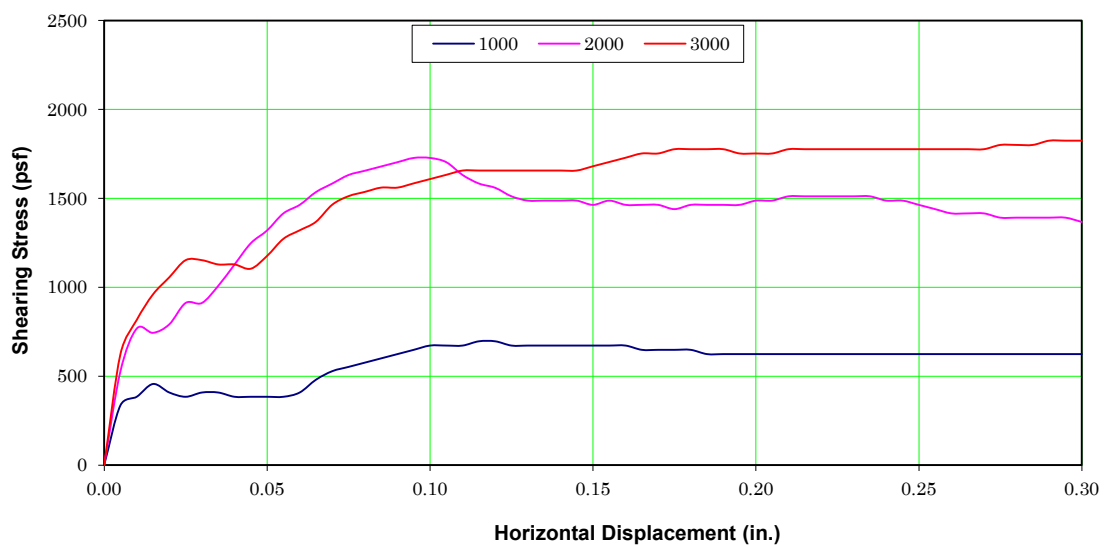
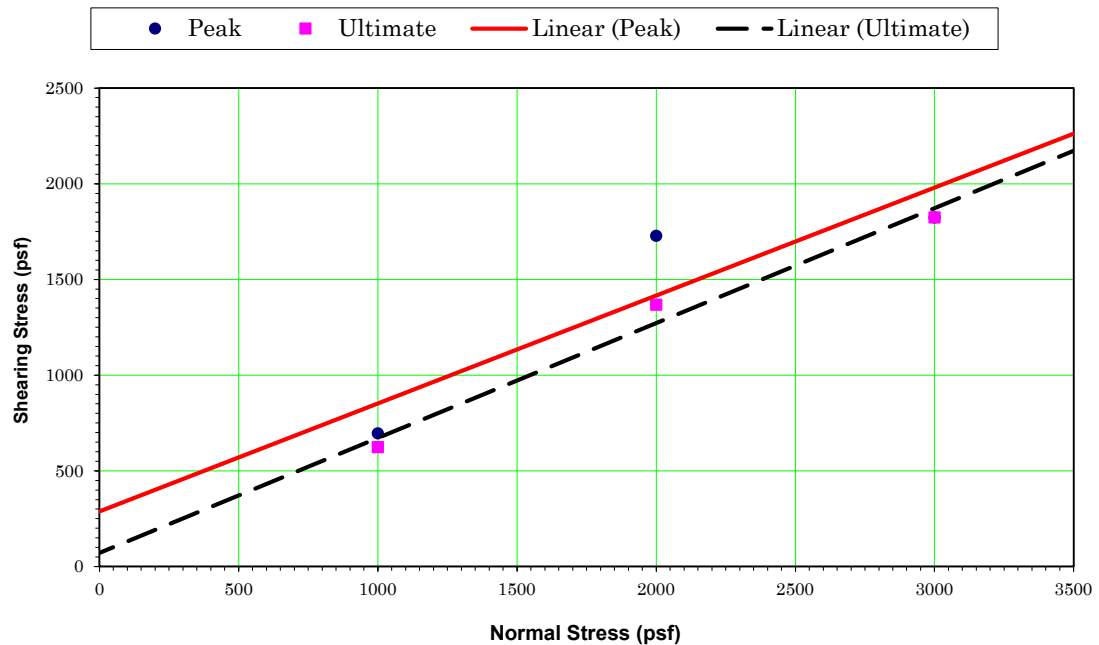
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 1 @ 4'  
 Sample Description: Silty Sand  
 Dry Density (pcf): 104.8  
 Initial % Moisture: 9.9  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0075 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 1000     | 2000 | 3000 |
|                                     | Peak stress (psf)     | 696      | 1728 | 1824 |
|                                     | Ultimate stress (psf) | 624      | 1368 | 1824 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 29                    | 31       |      |      |
| c Cohesive Strength (psf):          | 280                   | 70       |      |      |
| Test Type:                          | Peak & Ultimate       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

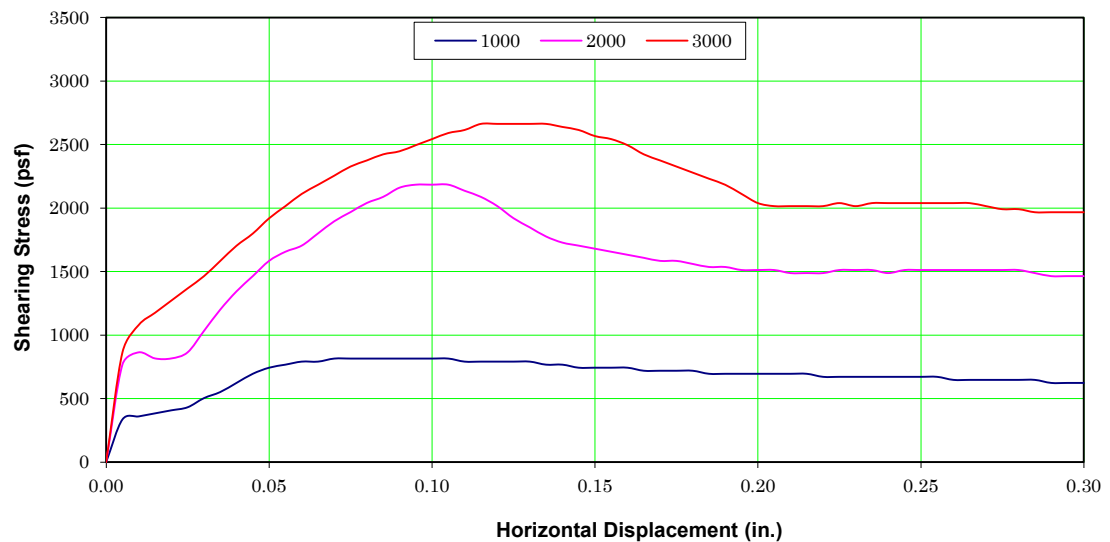
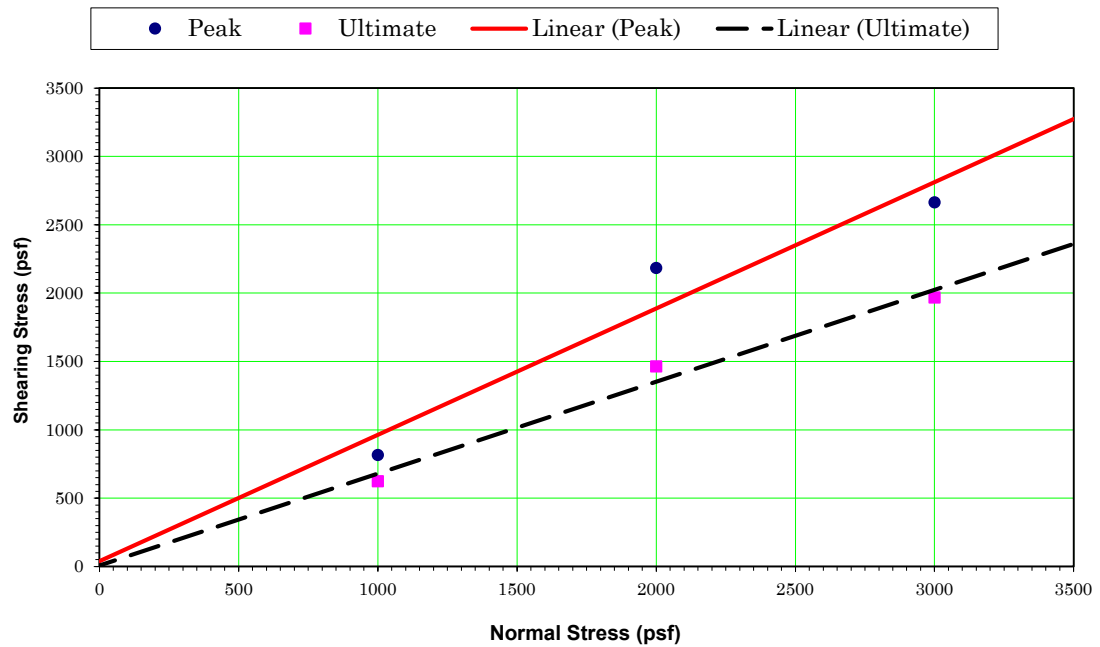
**Vic Trace Reservoir**



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VT-24831-01



### DIRECT SHEAR DATA\*

Sample Location: B 1 @ 10'  
 Sample Description: Clayey Silty Sand  
 Dry Density (pcf): 116.8  
 Initial % Moisture: 9.7  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0092 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 816  | 2184 | 2664 |
| Ultimate stress (psf) | 624  | 1464 | 1968 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 43   | 34       |
| c Cohesive Strength (psf):          | 40   | 0        |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

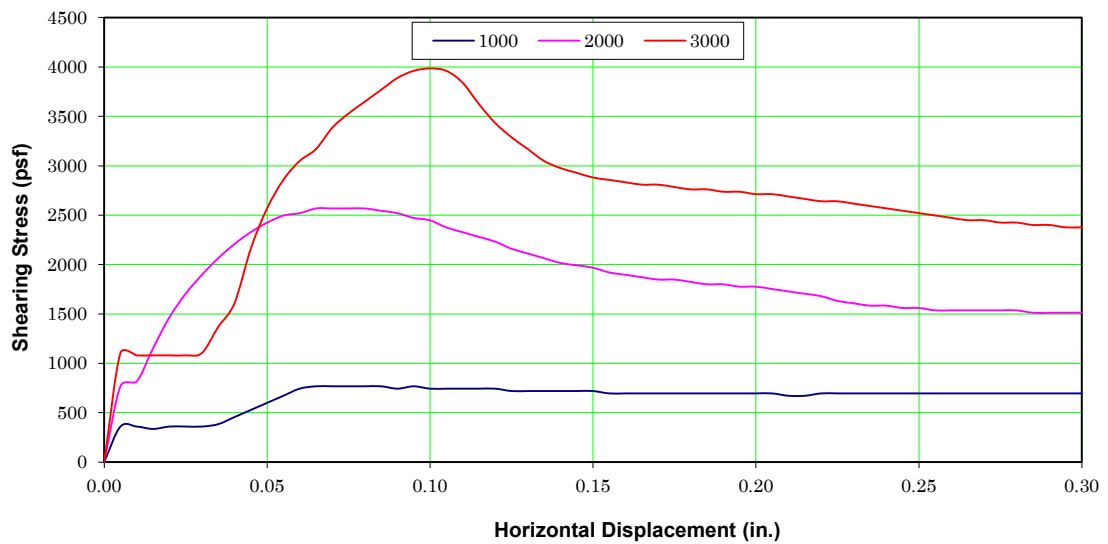
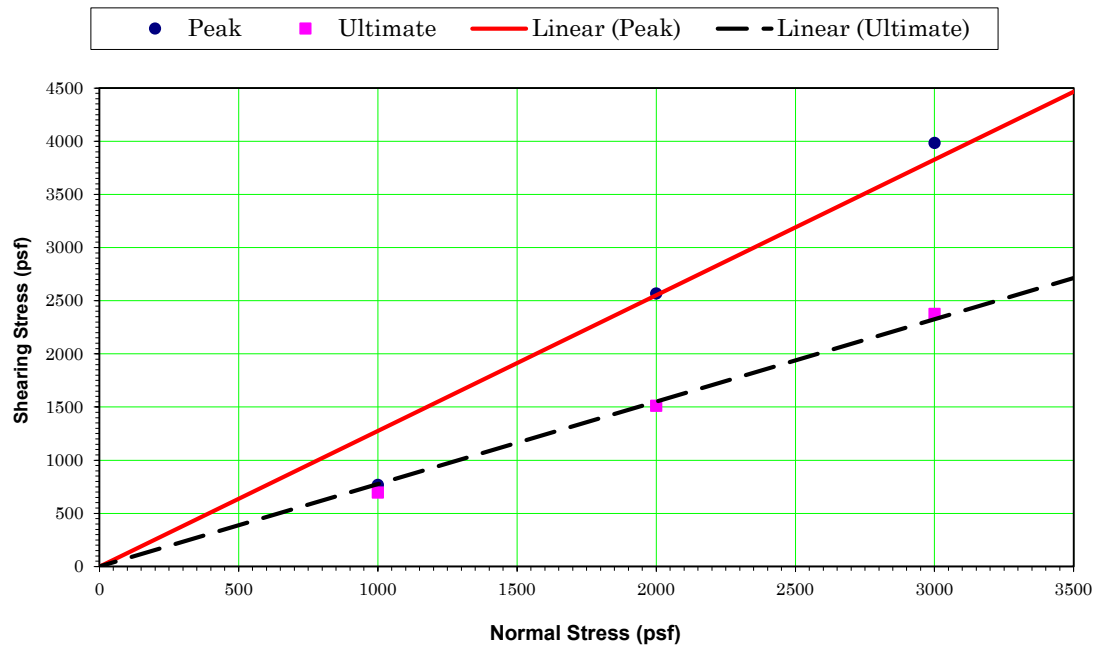
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 2 @ 7'  
 Sample Description: Silty Clayey Sand  
 Dry Density (pcf): 118.2  
 Initial % Moisture: 10.1  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0092 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 1000     | 2000 | 3000 |
|                                     | Peak stress (psf)     | 768      | 2568 | 3984 |
|                                     | Ultimate stress (psf) | 696      | 1512 | 2376 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 54                    | 38       |      |      |
| c Cohesive Strength (psf):          | 0                     | 0        |      |      |
| Test Type:                          | Peak & Ultimate       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

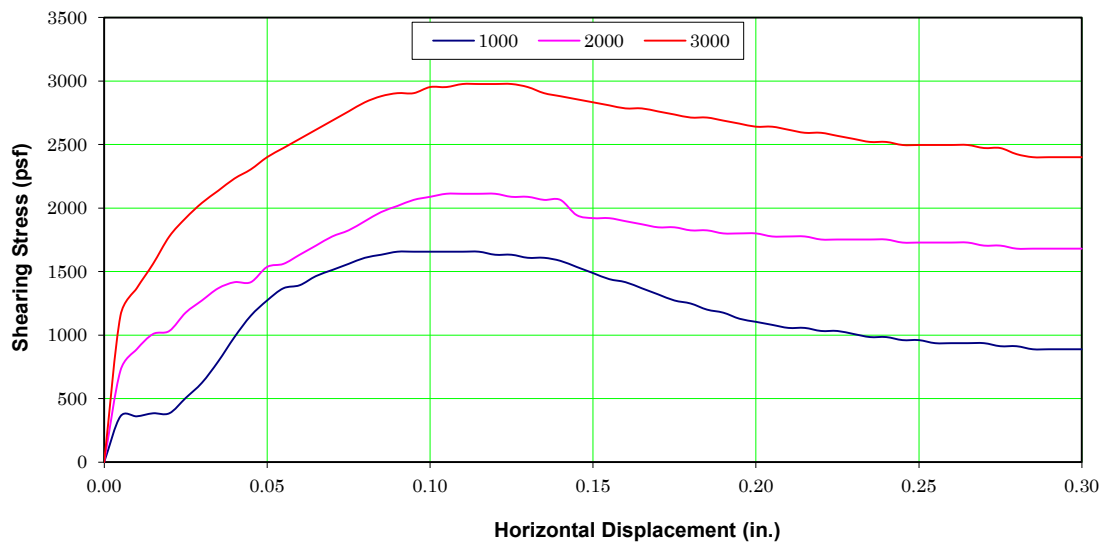
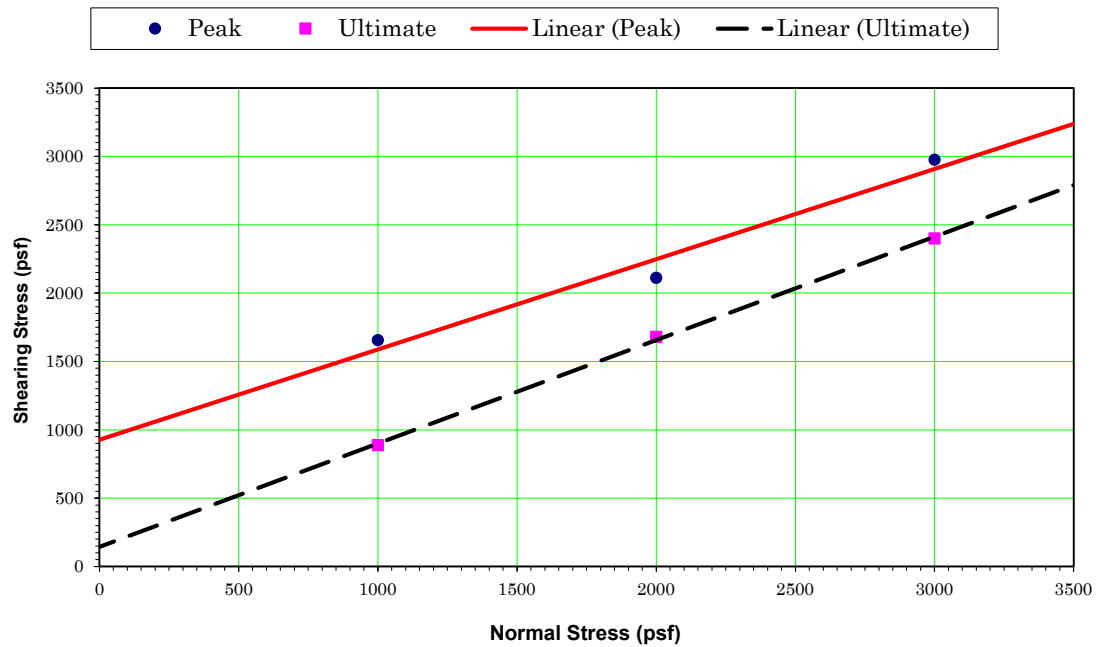
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 3 @ 13'  
 Sample Description: Sandy Silty Clay  
 Dry Density (pcf): 112.1  
 Initial % Moisture: 16.4  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0097 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 1656 | 2112 | 2976 |
| Ultimate stress (psf) | 888  | 1680 | 2400 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 33   | 37       |
| c Cohesive Strength (psf):          | 920  | 140      |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

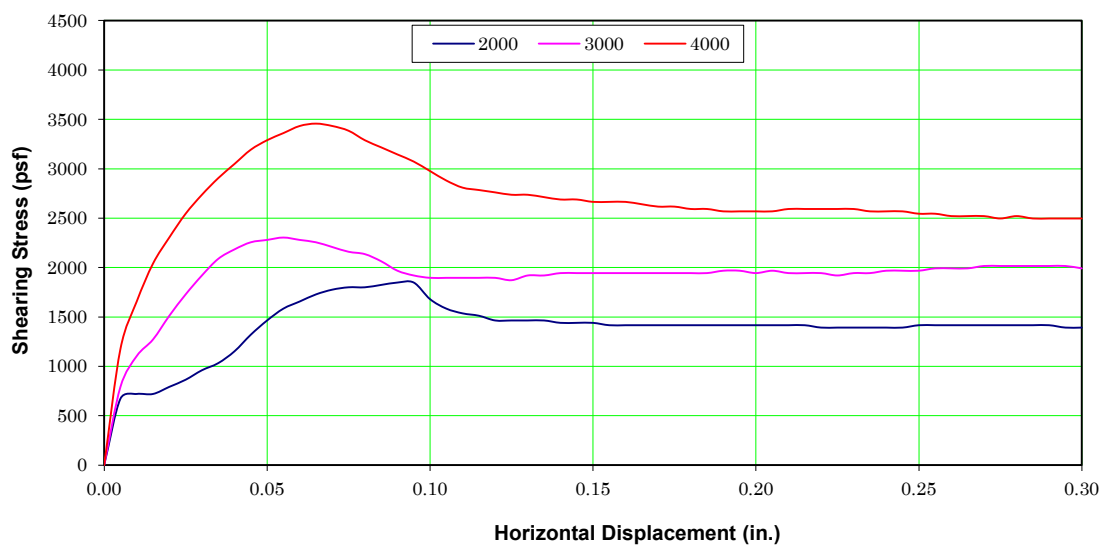
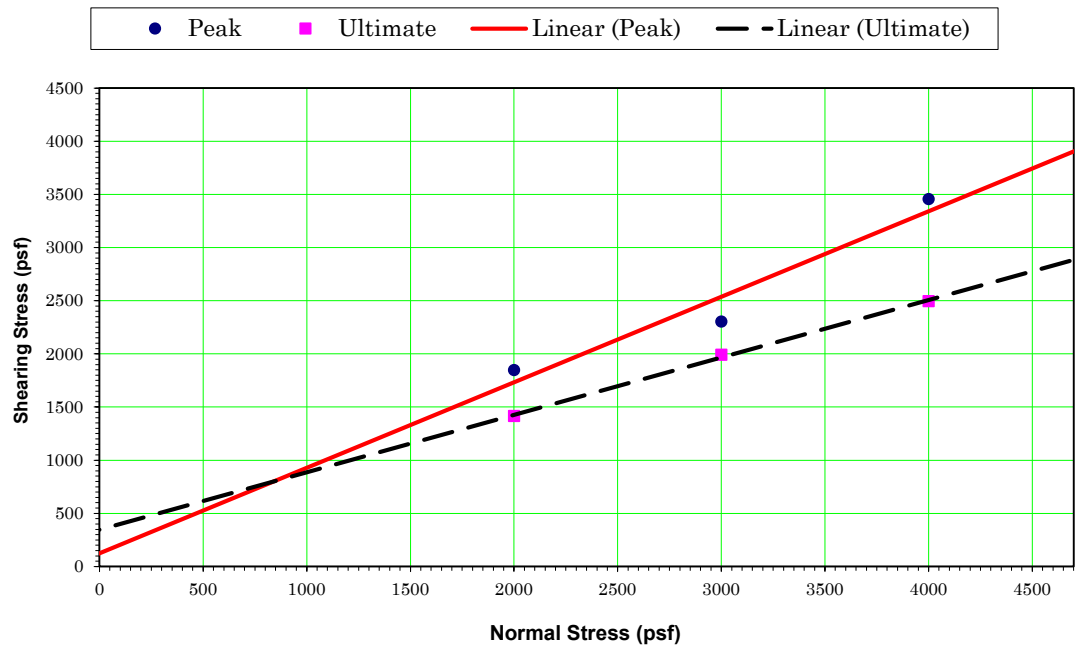
**Vic Trace Reservoir**



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### DIRECT SHEAR DATA\*

Sample Location: B 3 @ 25'  
 Sample Description: Clayey Silty Sand  
 Dry Density (pcf): 111.8  
 Initial % Moisture: 11.1  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.008 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 2000     | 3000 | 4000 |
|                                     | Peak stress (psf)     | 1848     | 2304 | 3456 |
|                                     | Ultimate stress (psf) | 1416     | 1992 | 2496 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 39                    | 28       |      |      |
| c Cohesive Strength (psf):          | 120                   | 340      |      |      |
| Test Type: Peak & Ultimate          |                       |          |      |      |

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

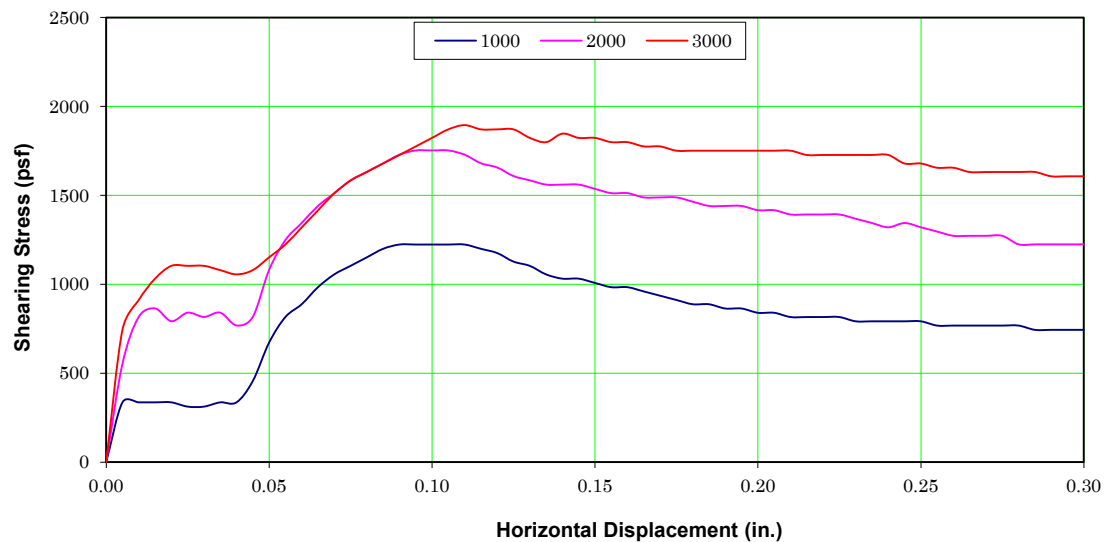
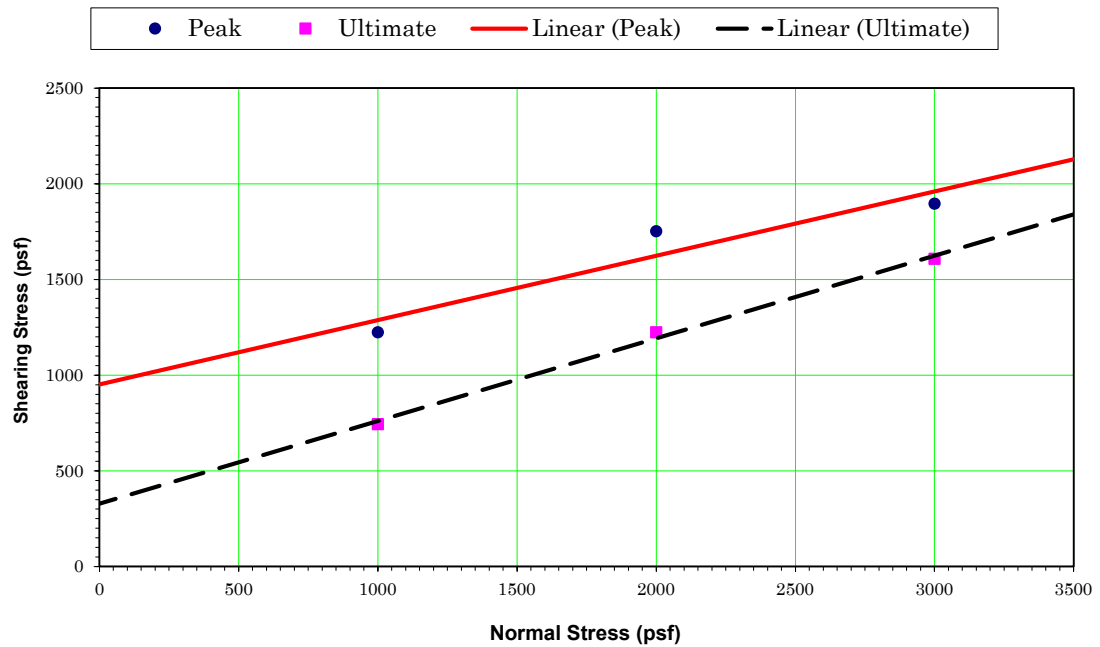
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 4 @ 7'  
 Sample Description: Silty Clay  
 Dry Density (pcf): 94.2  
 Initial % Moisture: 27.3  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0092 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 1224 | 1752 | 1896 |
| Ultimate stress (psf) | 744  | 1224 | 1608 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 19   | 23       |
| c Cohesive Strength (psf):          | 950  | 320      |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

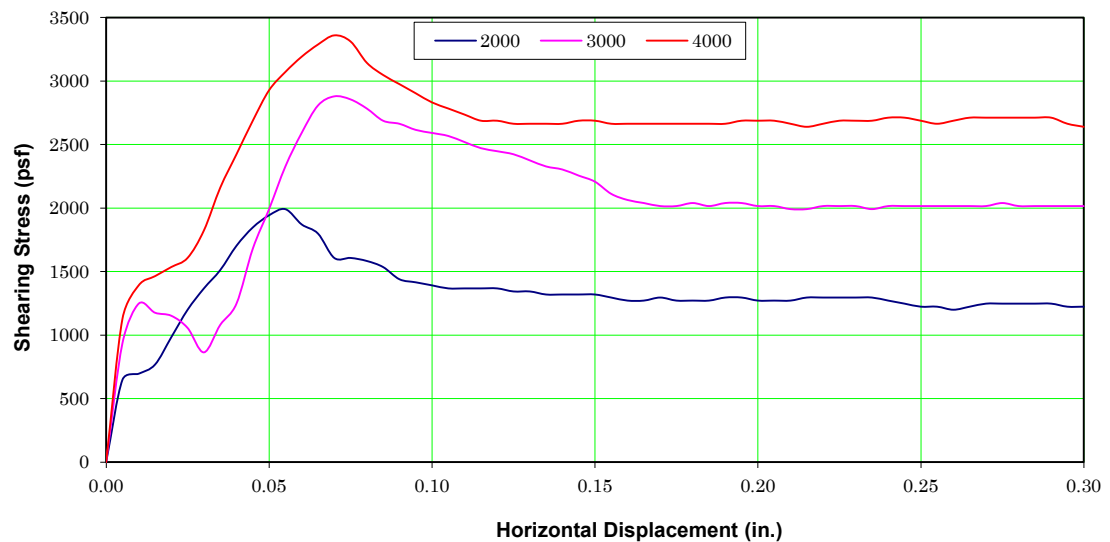
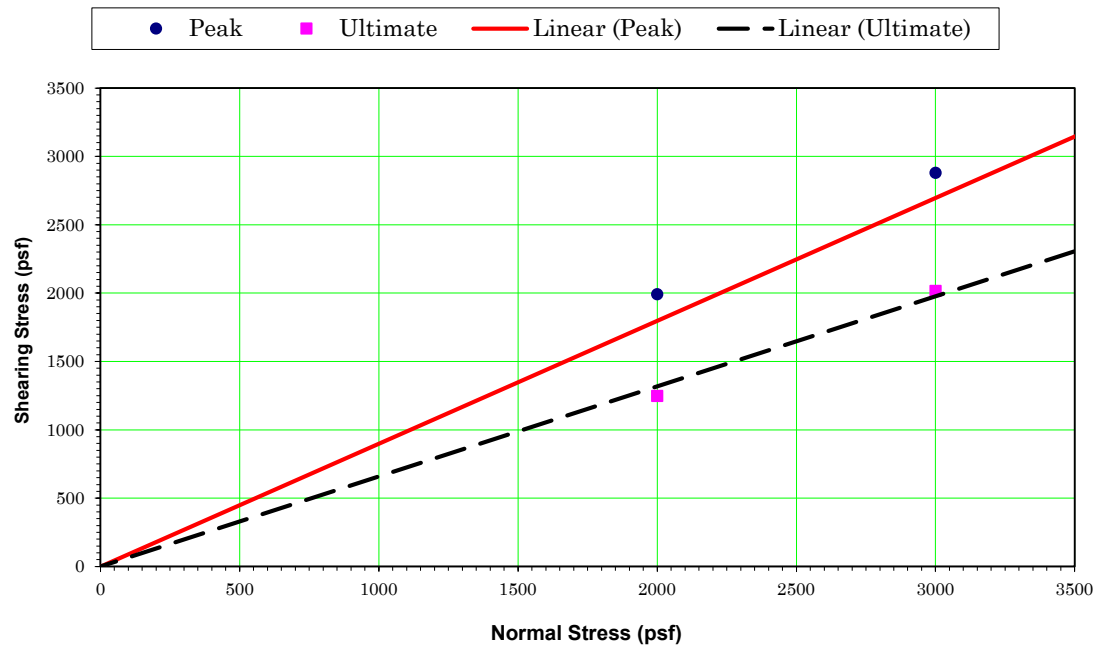
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: B 4 @ 20'  
 Sample Description: Clayey Silty Sand  
 Dry Density (pcf): 111.1  
 Initial % Moisture: 11.9  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0073 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 2000 | 3000 | 4000 |
| Peak stress (psf)     | 1992 | 2880 | 3360 |
| Ultimate stress (psf) | 1248 | 2016 | 2640 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 34   | 34       |
| c Cohesive Strength (psf):          | 690  | 0        |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

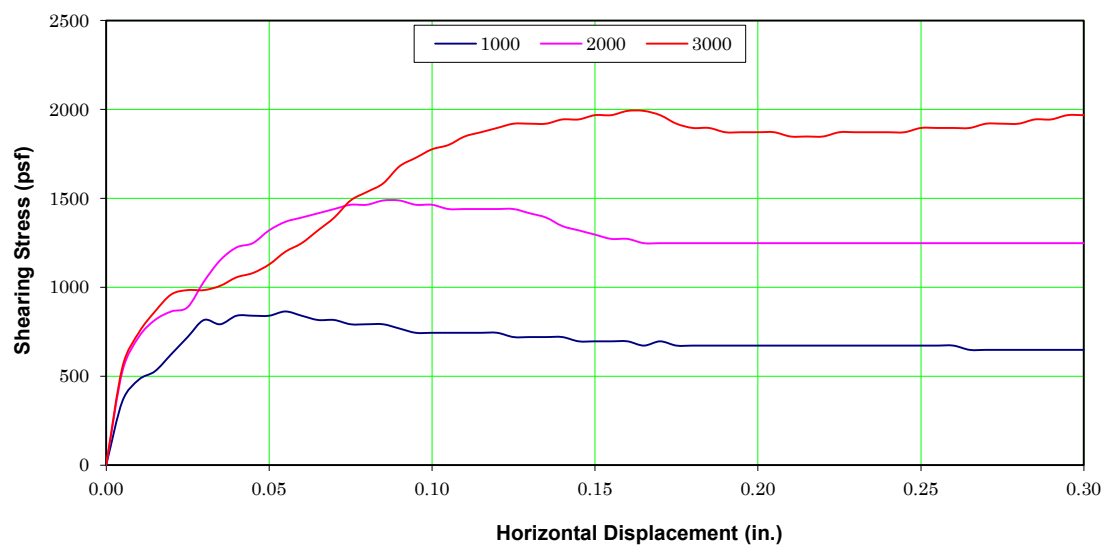
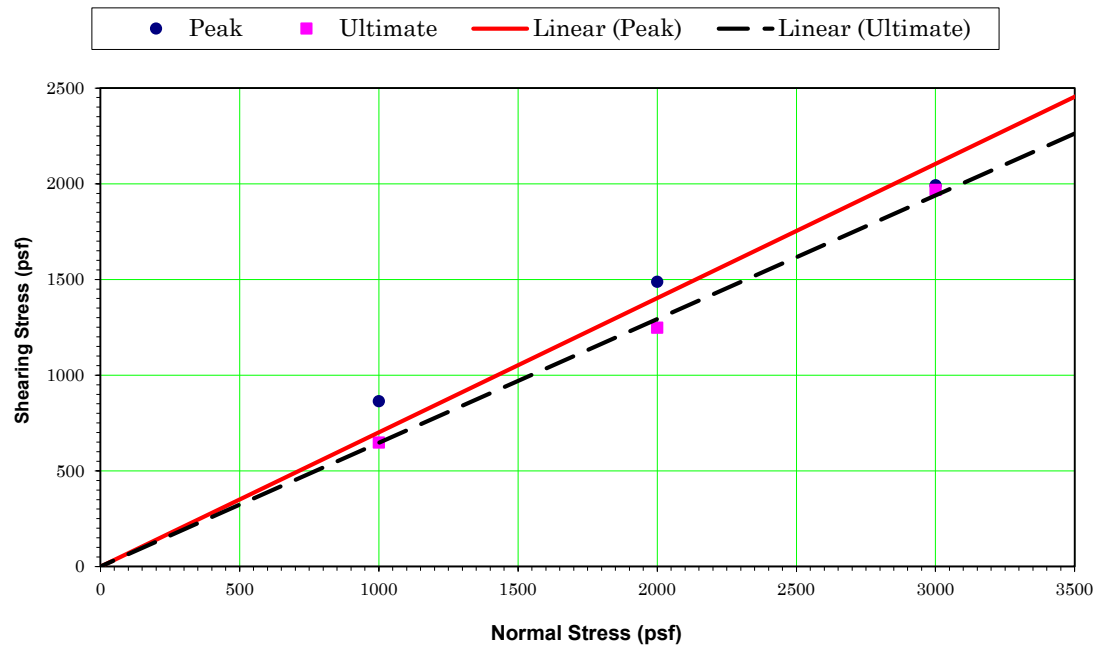
**Vic Trace Reservoir**



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### DIRECT SHEAR DATA\*

Sample Location: B 6 @ 7'  
 Sample Description: Clayey Silty Sand  
 Dry Density (pcf): 107.8  
 Initial % Moisture: 10.7  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0112 in/min

|                       |      |      |      |
|-----------------------|------|------|------|
| Normal stress (psf)   | 1000 | 2000 | 3000 |
| Peak stress (psf)     | 864  | 1488 | 1992 |
| Ultimate stress (psf) | 648  | 1248 | 1968 |

|                                     |      |          |
|-------------------------------------|------|----------|
|                                     | Peak | Ultimate |
| $\phi$ Angle of Friction (degrees): | 29   | 33       |
| c Cohesive Strength (psf):          | 320  | 0        |
| Test Type: Peak & Ultimate          |      |          |

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

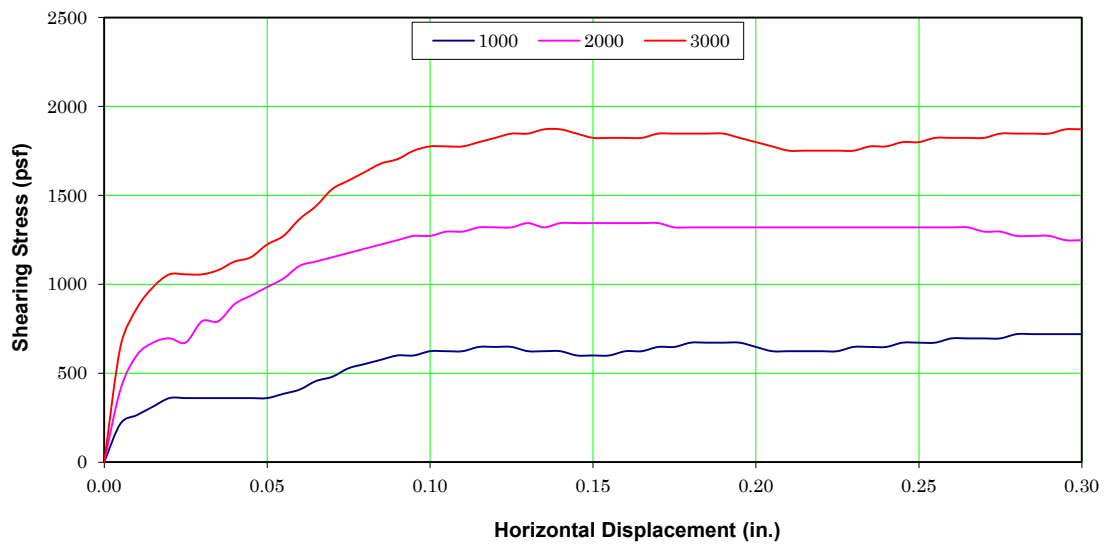
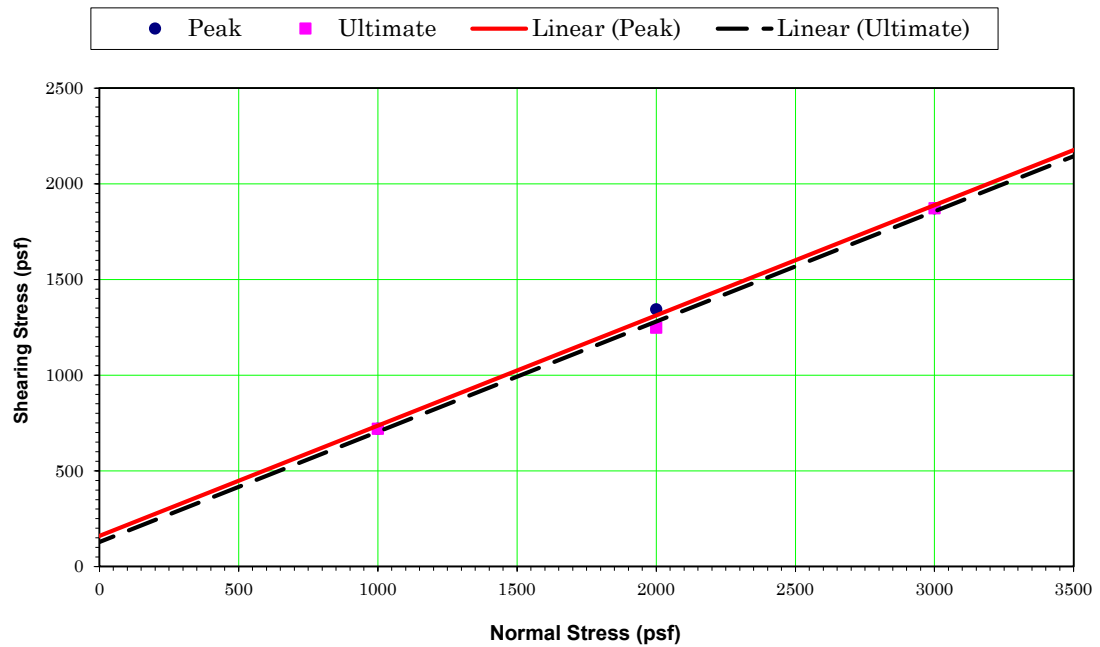
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: BA 1 @ 10'  
 Sample Description: Silty Sand  
 Dry Density (pcf): 101.7  
 Initial % Moisture: 6.7  
 Average Degree of Saturation: 95.9  
 Shear Rate (in/min): 0.0138 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 1000     | 2000 | 3000 |
|                                     | Peak stress (psf)     | 720      | 1344 | 1872 |
|                                     | Ultimate stress (psf) | 720      | 1248 | 1872 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 30                    | 30       |      |      |
| c Cohesive Strength (psf):          | 160                   | 120      |      |      |
| Test Type:                          | Peak & Ultimate       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

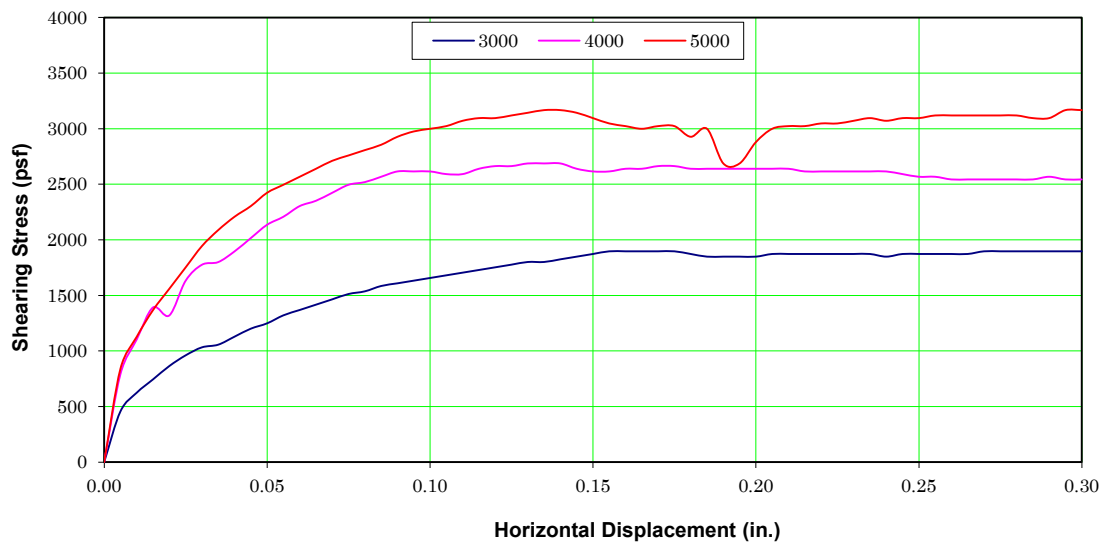
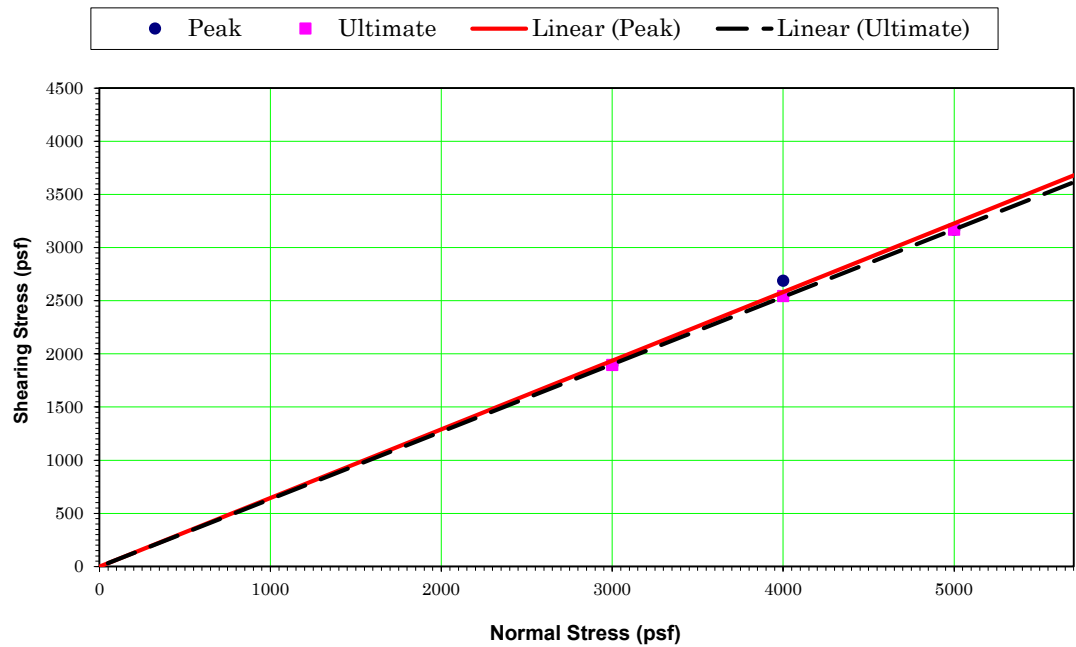
**Vic Trace Reservoir**



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### DIRECT SHEAR DATA\*

Sample Location: BA 1 @ 25'  
 Sample Description: Clayey Silty Sand  
 Dry Density (pcf): 100.0  
 Initial % Moisture: 10.7  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0062 in/min

|                                |                       |      |          |      |
|--------------------------------|-----------------------|------|----------|------|
|                                | Normal stress (psf)   | 3000 | 4000     | 5000 |
|                                | Peak stress (psf)     | 1896 | 2688     | 3168 |
|                                | Ultimate stress (psf) | 1896 | 2544     | 3168 |
|                                |                       | Peak | Ultimate |      |
| φ Angle of Friction (degrees): |                       | 32   | 32       |      |
| c Cohesive Strength (psf):     |                       | 40   | 0        |      |
| Test Type:                     | Peak & Ultimate       |      |          |      |

\* Test Method: ASTM D-3080

### DIRECT SHEAR TEST

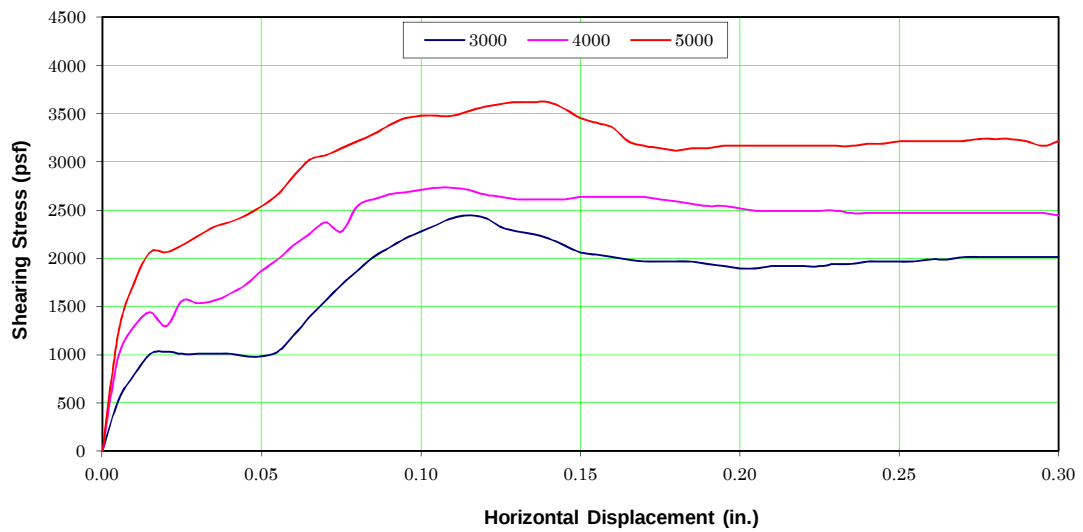
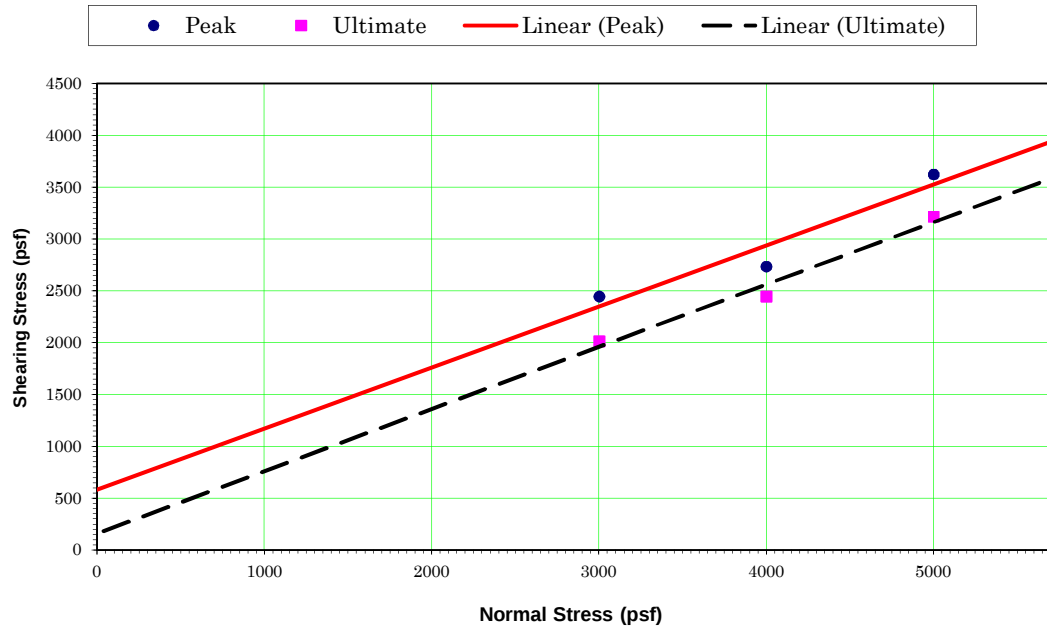
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: BA 1 @ 30'  
 Sample Description: Sandy Silty Clay  
 Dry Density (pcf): 104.4  
 Initial % Moisture: 16.3  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0124 in/min

| Normal stress (psf)   | 3000 | 4000 | 5000 |
|-----------------------|------|------|------|
| Peak stress (psf)     | 2448 | 2736 | 3624 |
| Ultimate stress (psf) | 2016 | 2448 | 3216 |

|                                     | Peak | Ultimate |
|-------------------------------------|------|----------|
| $\phi$ Angle of Friction (degrees): | 30   | 31       |
| c Cohesive Strength (psf):          | 580  | 160      |

Test Type: Peak & Ultimate

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

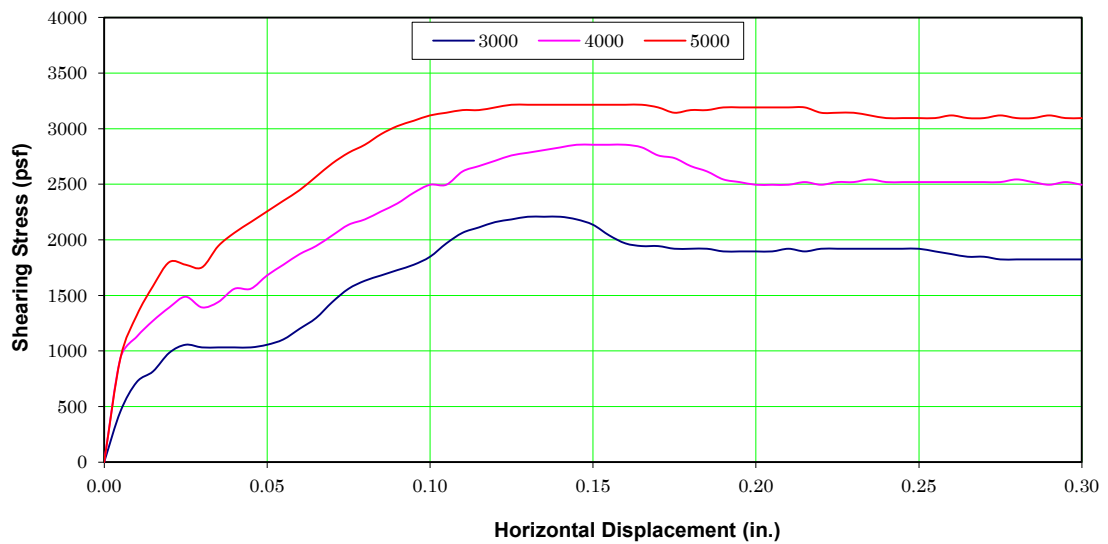
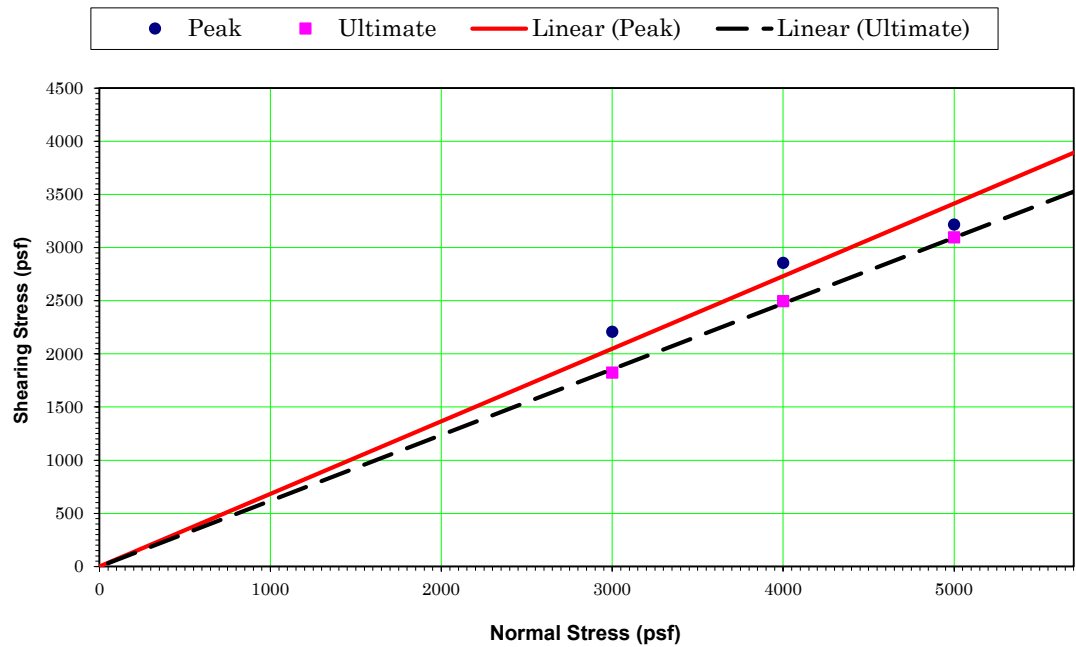
Vic Trace Reservoir



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#### DIRECT SHEAR DATA\*

Sample Location: BA 2 @ 25'  
 Sample Description: Clayey Sandy Silt  
 Dry Density (pcf): 106.9  
 Initial % Moisture: 13.2  
 Average Degree of Saturation: 95.7  
 Shear Rate (in/min): 0.005 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 3000     | 4000 | 5000 |
|                                     | Peak stress (psf)     | 2208     | 2856 | 3216 |
|                                     | Ultimate stress (psf) | 1824     | 2496 | 3096 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 27                    | 32       |      |      |
| c Cohesive Strength (psf):          | 740                   | 0        |      |      |
| Test Type:                          | Peak & Ultimate       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

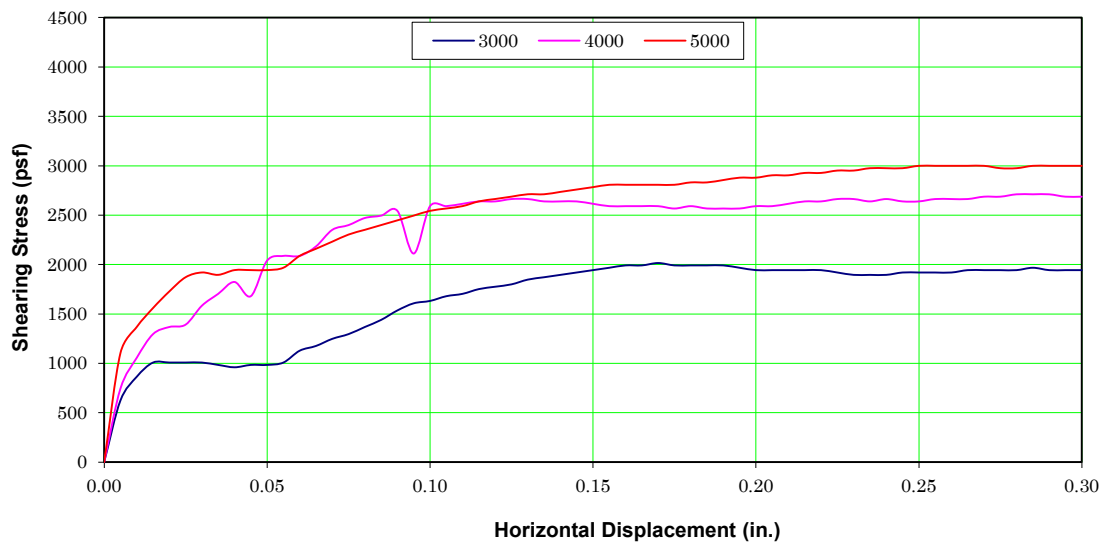
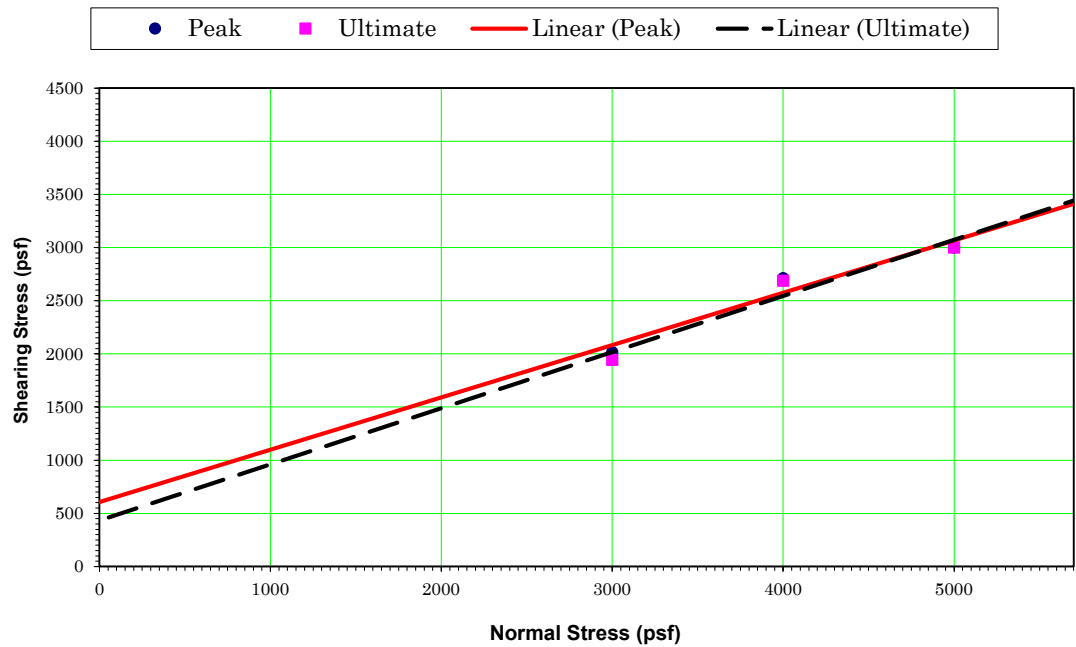
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: BA 2 @ 30'  
 Sample Description: Silty sand  
 Dry Density (pcf): 96.2  
 Initial % Moisture: 10.8  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.0072 in/min

|                                     |                       |          |      |      |
|-------------------------------------|-----------------------|----------|------|------|
|                                     | Normal stress (psf)   | 3000     | 4000 | 5000 |
|                                     | Peak stress (psf)     | 2016     | 2712 | 3000 |
|                                     | Ultimate stress (psf) | 1944     | 2688 | 3000 |
|                                     | Peak                  | Ultimate |      |      |
| $\phi$ Angle of Friction (degrees): | 26                    | 28       |      |      |
| c Cohesive Strength (psf):          | 600                   | 430      |      |      |
| Test Type:                          | Peak & Ultimate       |          |      |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

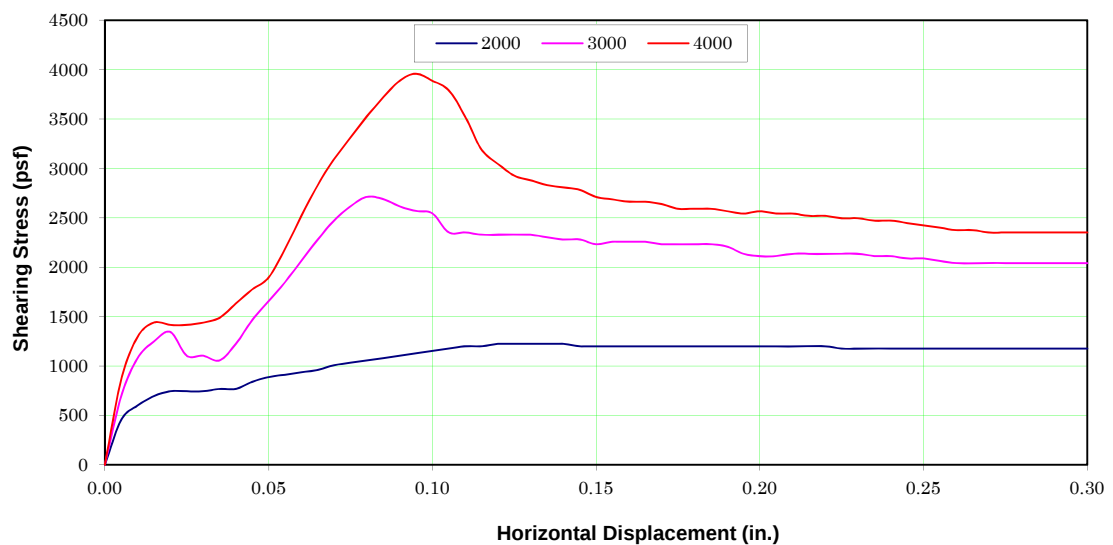
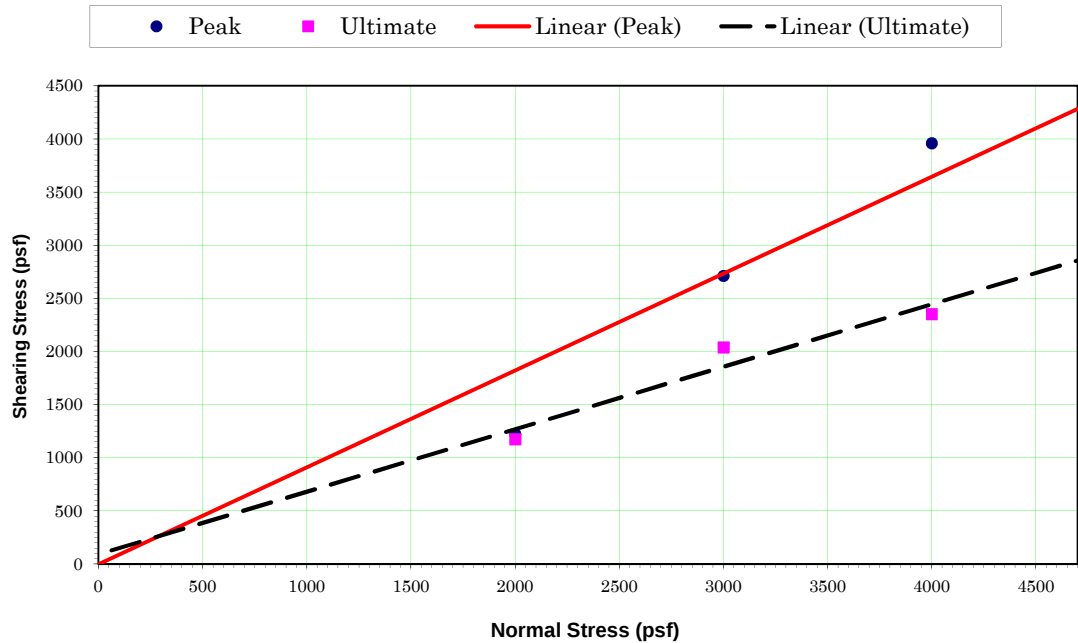
**Vic Trace Reservoir**



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#### DIRECT SHEAR DATA\*

Sample Location: BA 3 @ 20'  
 Sample Description: Silty Clay  
 Dry Density (pcf): 100.8  
 Initial % Moisture: 22.3  
 Average Degree of Saturation: 100.0  
 Shear Rate (in/min): 0.005 in/min

|                                     | 2000            | 3000     | 4000 |
|-------------------------------------|-----------------|----------|------|
| Normal stress (psf)                 | 2000            | 3000     | 4000 |
| Peak stress (psf)                   | 1224            | 2712     | 3960 |
| Ultimate stress (psf)               | 1176            | 2040     | 2352 |
|                                     | Peak            | Ultimate |      |
| $\phi$ Angle of Friction (degrees): | 45              | 30       |      |
| c Cohesive Strength (psf):          | 0               | 90       |      |
| Test Type:                          | Peak & Ultimate |          |      |

\* Test Method: ASTM D-3080

#### DIRECT SHEAR TEST

**Vic Trace Reservoir**



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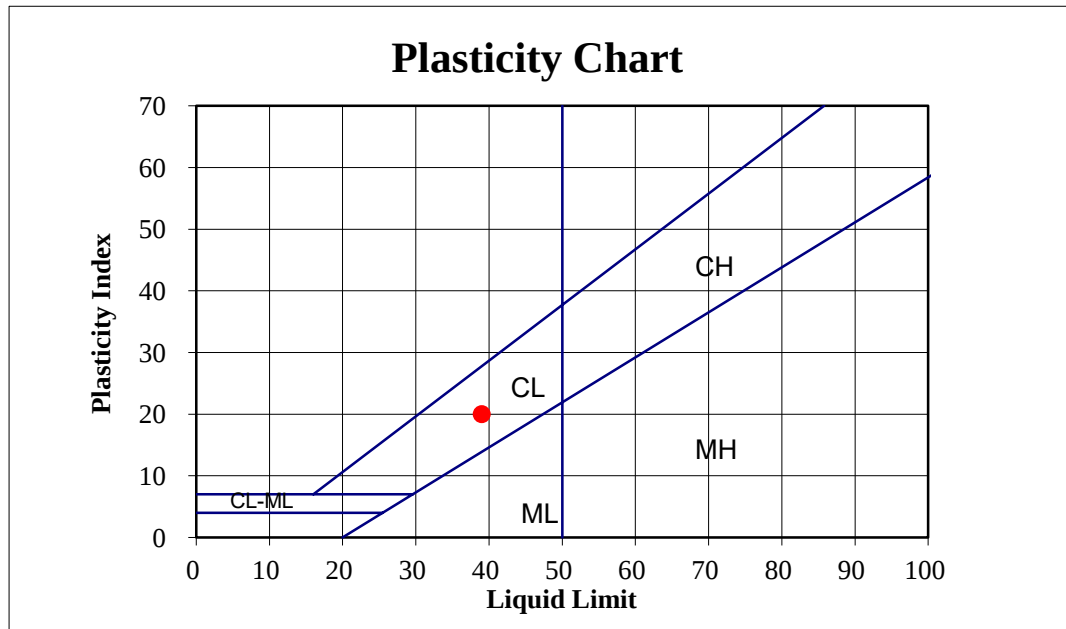
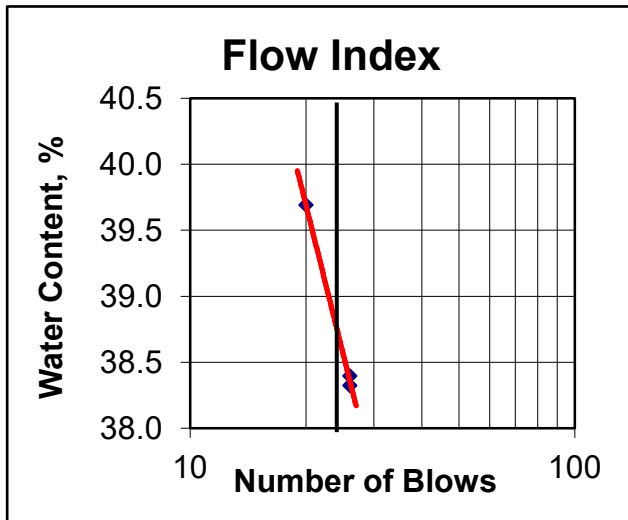
**PLASTICITY INDEX**

ASTM D-4318

Job Name: Vic Trace Reservoir  
 Sample ID: B 3 @ 13'  
 Soil Description: CL

**DATA SUMMARY****TEST RESULTS**

|                  |      |      |      |                         |           |
|------------------|------|------|------|-------------------------|-----------|
| Number of Blows: | 20   | 26   | 26   | <b>LIQUID LIMIT</b>     | <b>39</b> |
| Water Content, % | 39.7 | 38.3 | 38.4 | <b>PLASTIC LIMIT</b>    | <b>19</b> |
| Plastic Limit:   | 19.1 | 19.1 |      | <b>PLASTICITY INDEX</b> | <b>20</b> |



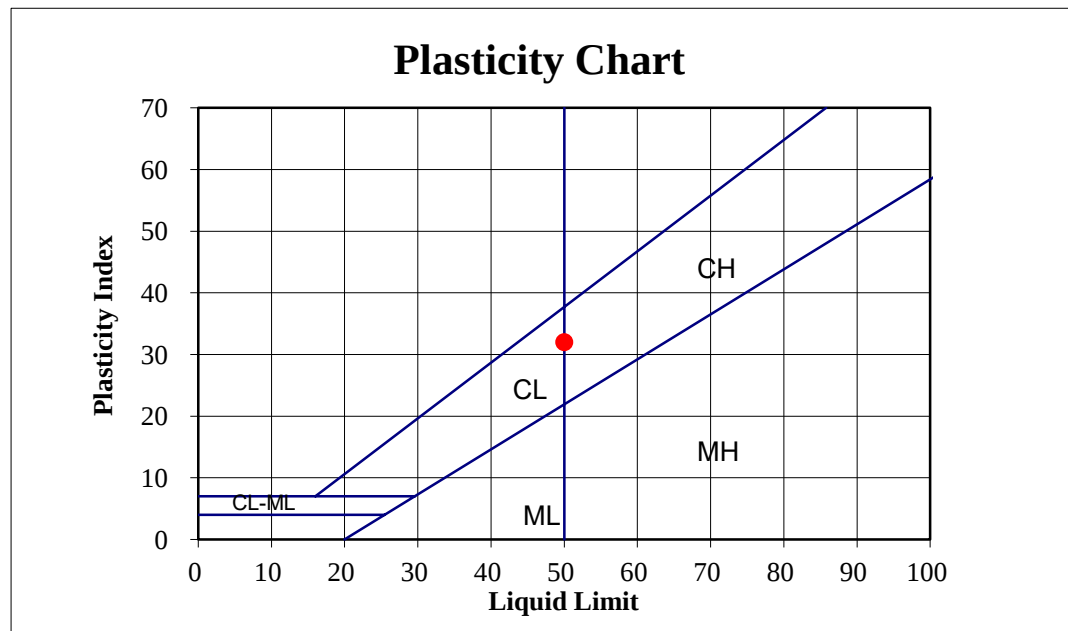
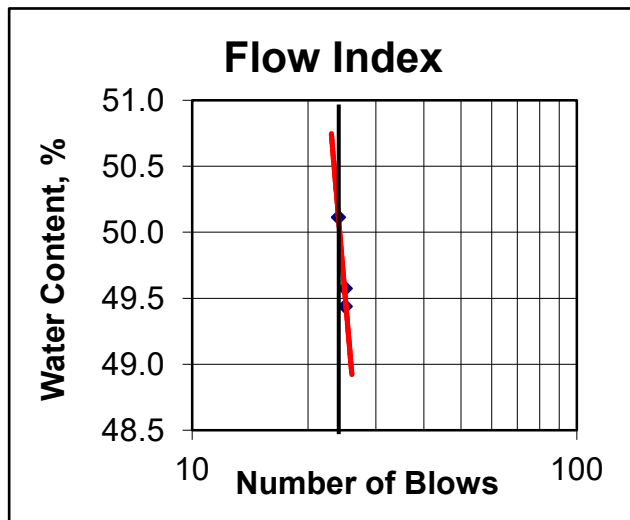
**PLASTICITY INDEX**

ASTM D-4318

Job Name: Vic Trace Reservoir  
 Sample ID: B 4 @ 7'  
 Soil Description: CL

**DATA SUMMARY****TEST RESULTS**

|                  |      |      |      |                         |           |
|------------------|------|------|------|-------------------------|-----------|
| Number of Blows: | 24   | 25   | 25   | <b>LIQUID LIMIT</b>     | <b>50</b> |
| Water Content, % | 50.1 | 49.6 | 49.4 | <b>PLASTIC LIMIT</b>    | <b>18</b> |
| Plastic Limit:   | 18.0 | 18.0 |      | <b>PLASTICITY INDEX</b> | <b>32</b> |



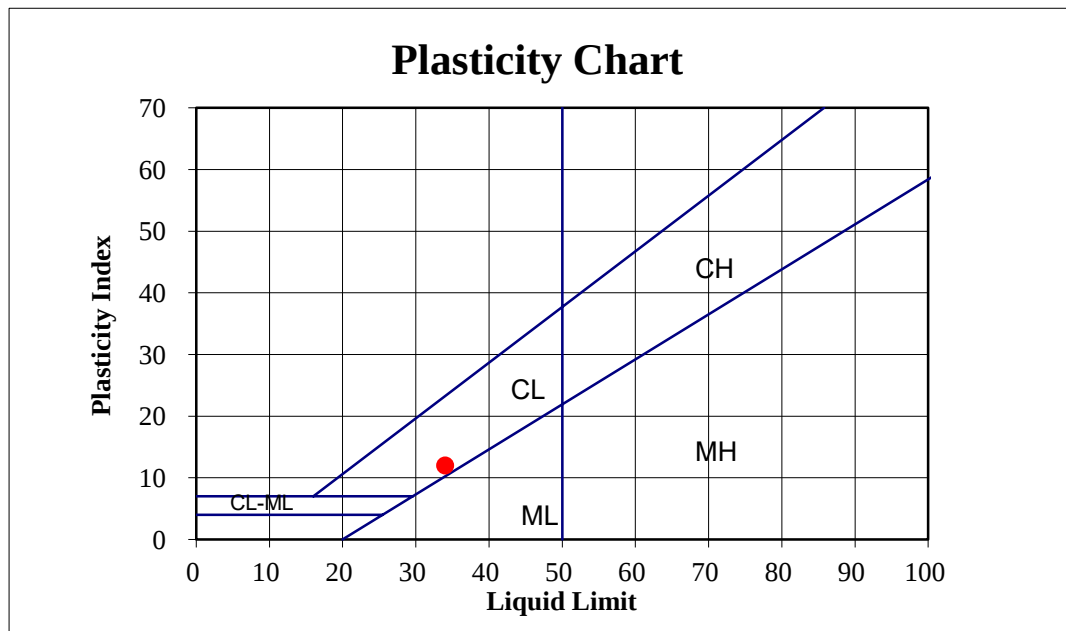
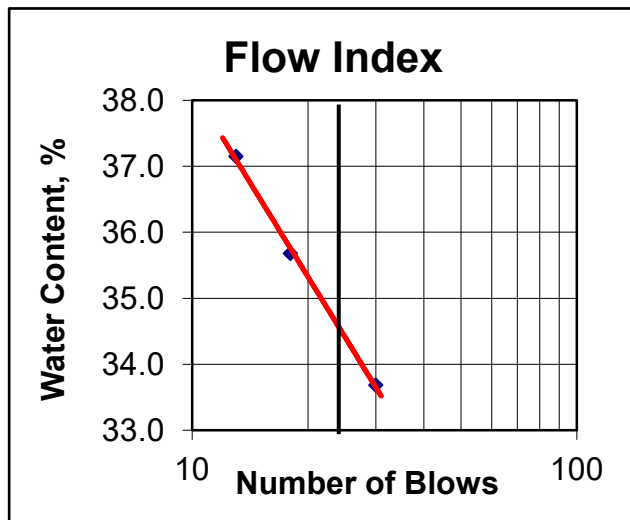
**PLASTICITY INDEX**

ASTM D-4318

Job Name: Vic Trace Reservoir  
 Sample ID: BA 1 @ 30'  
 Soil Description: ML/CL

**DATA SUMMARY****TEST RESULTS**

|                  |      |      |      |                         |           |
|------------------|------|------|------|-------------------------|-----------|
| Number of Blows: | 13   | 18   | 30   | <b>LIQUID LIMIT</b>     | <b>34</b> |
| Water Content, % | 37.2 | 35.7 | 33.7 | <b>PLASTIC LIMIT</b>    | <b>22</b> |
| Plastic Limit:   | 21.5 | 21.6 |      | <b>PLASTICITY INDEX</b> | <b>12</b> |



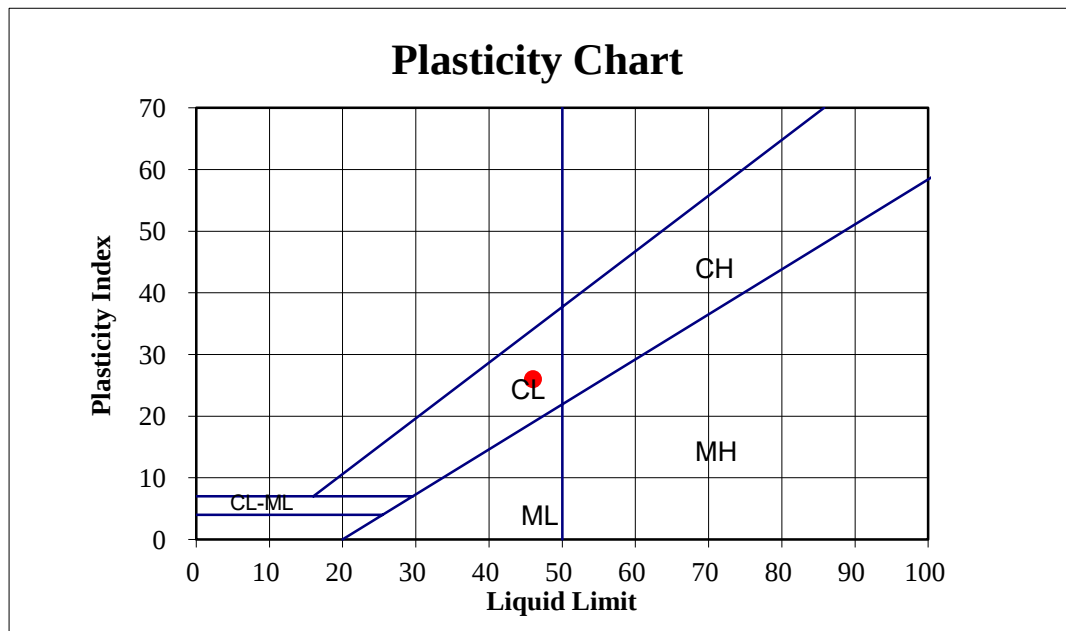
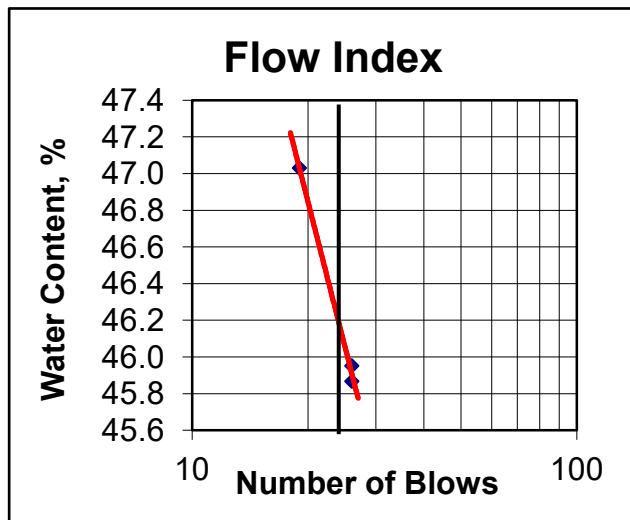
**PLASTICITY INDEX**

ASTM D-4318

Job Name: Vic Trace Reservoir  
 Sample ID: BA 3 @ 20'  
 Soil Description: CL

**DATA SUMMARY****TEST RESULTS**

|                  |      |      |      |                         |           |
|------------------|------|------|------|-------------------------|-----------|
| Number of Blows: | 19   | 26   | 26   | <b>LIQUID LIMIT</b>     | <b>46</b> |
| Water Content, % | 47.0 | 46.0 | 45.9 | <b>PLASTIC LIMIT</b>    | <b>20</b> |
| Plastic Limit:   | 19.8 | 19.8 |      | <b>PLASTICITY INDEX</b> | <b>26</b> |

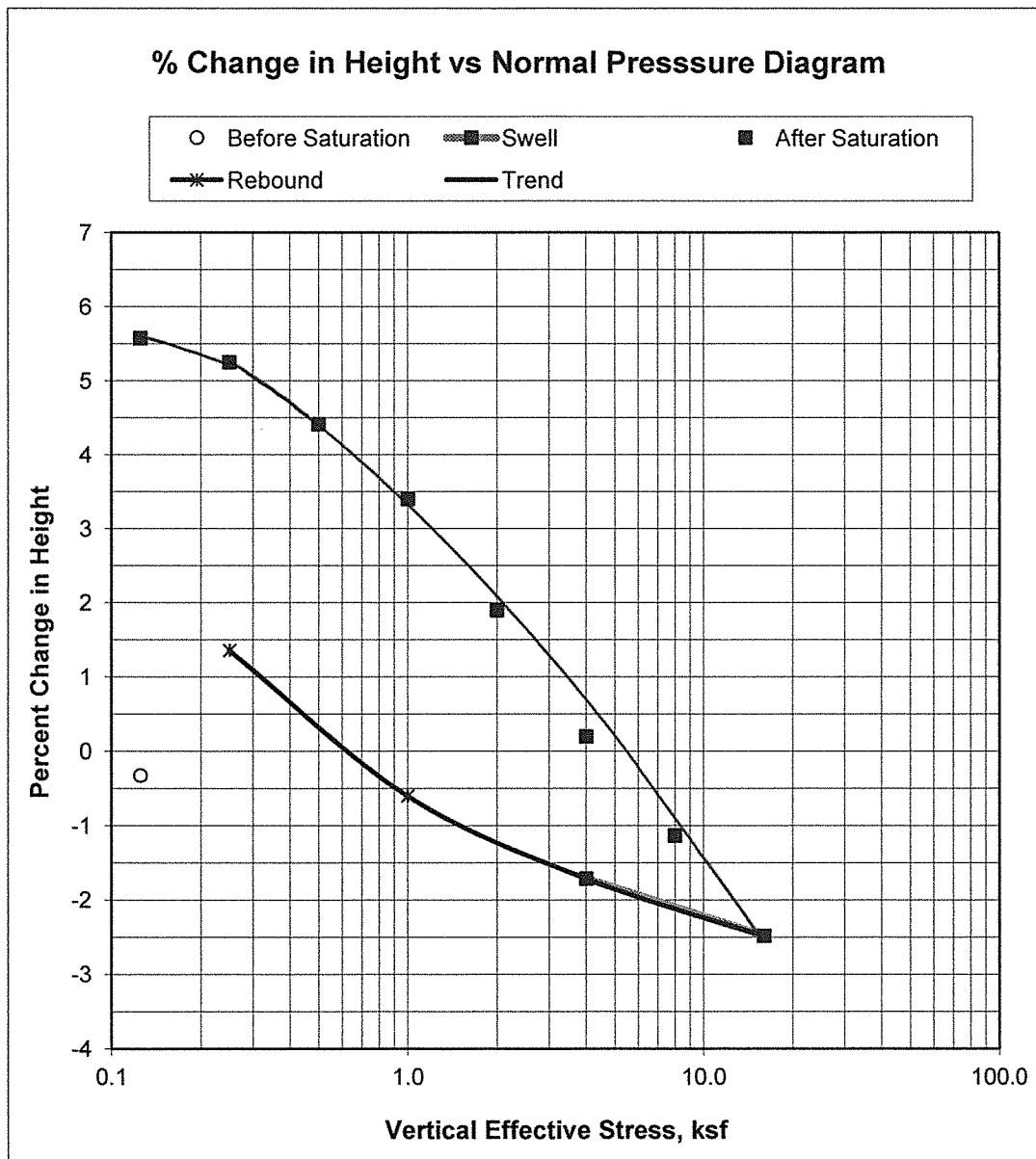


**CONSOLIDATION TEST**

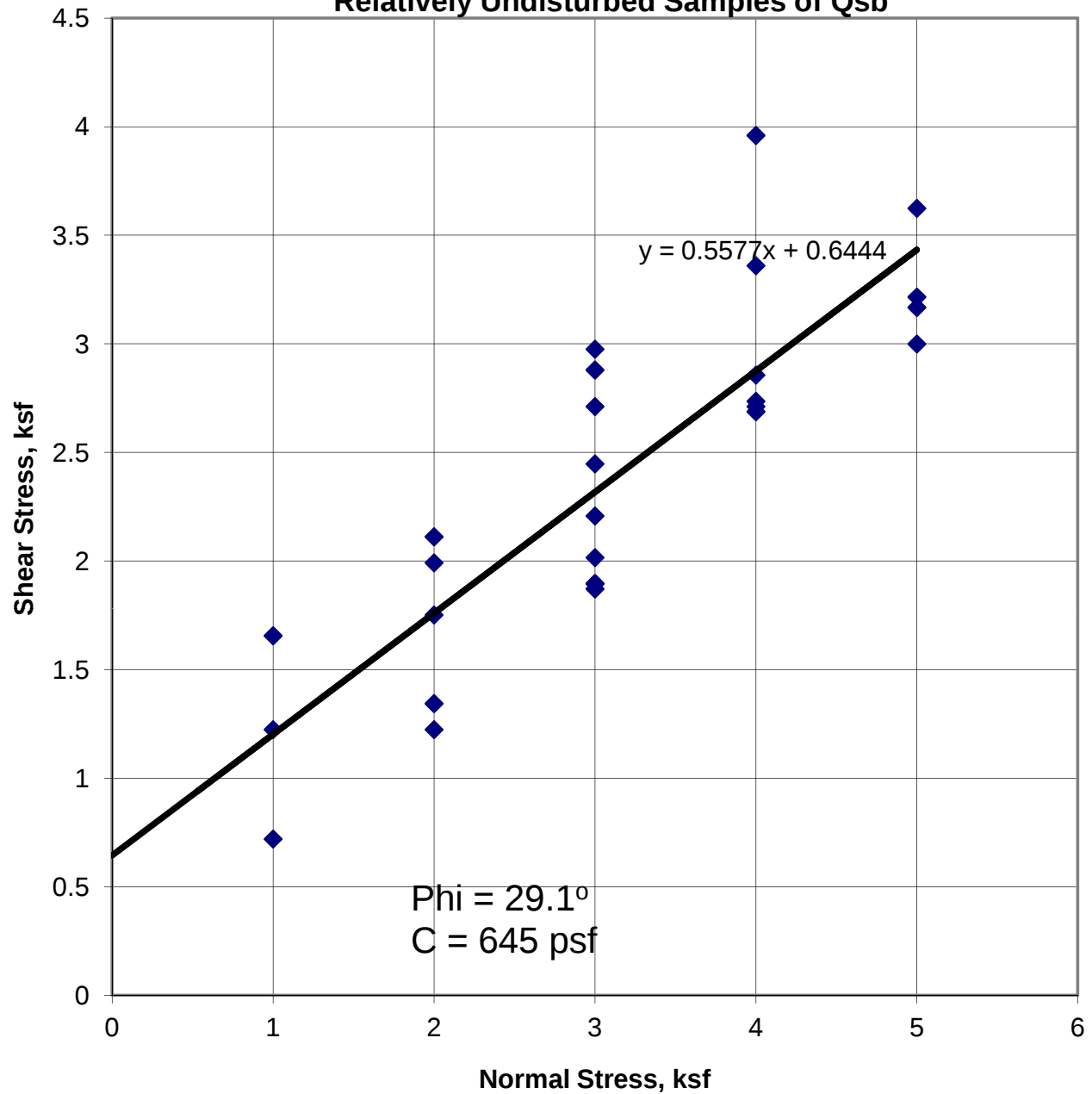
ASTM D 2435-90

Vic Trace Reservoir  
B 2 @ 11'  
SC  
Ring Sample

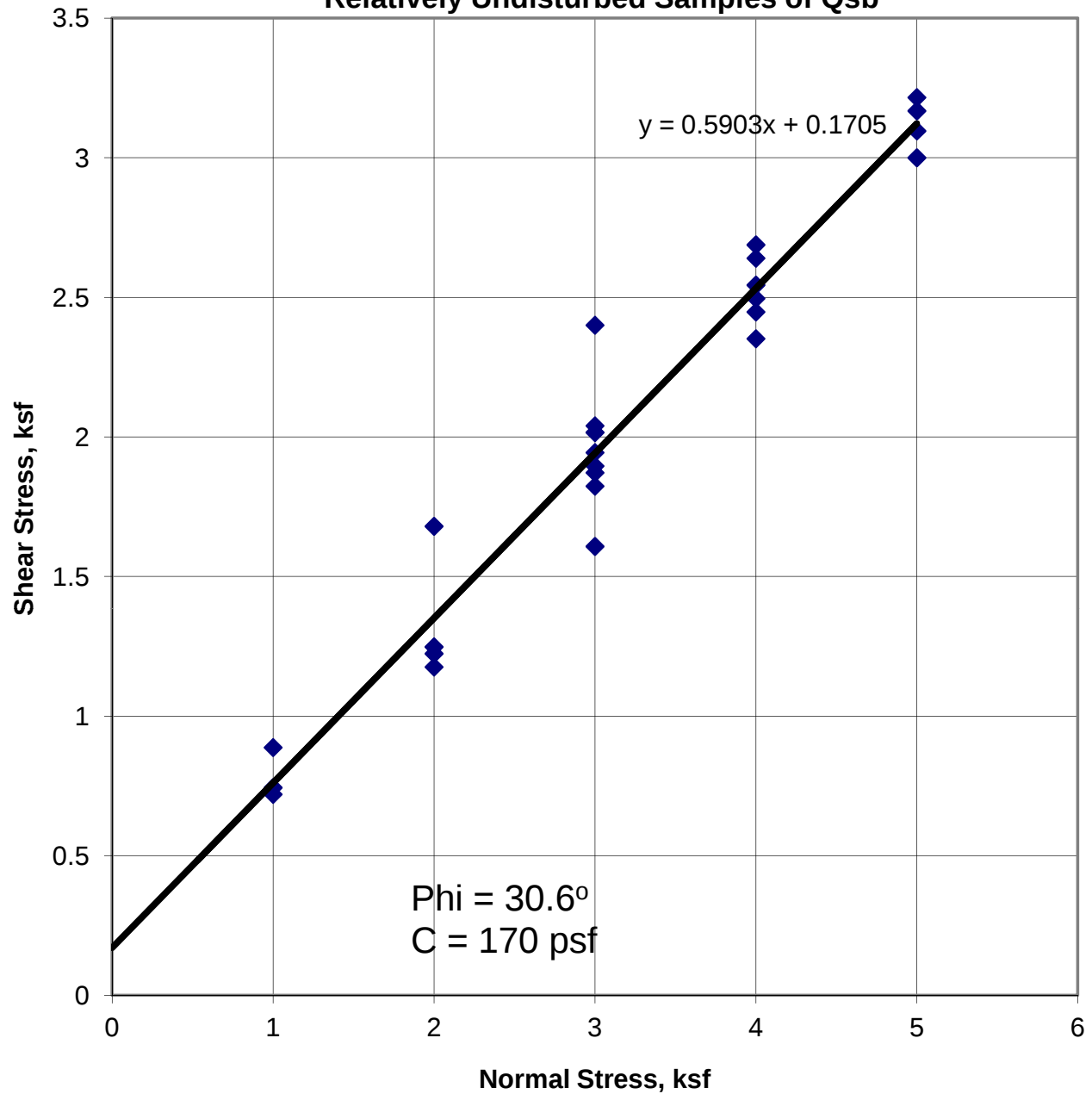
Initial Dry Density: 124.0 pcf  
Initial Moisture, %: 10.4%  
Specific Gravity: 2.67 (assumed)  
Initial Void Ratio: 0.344



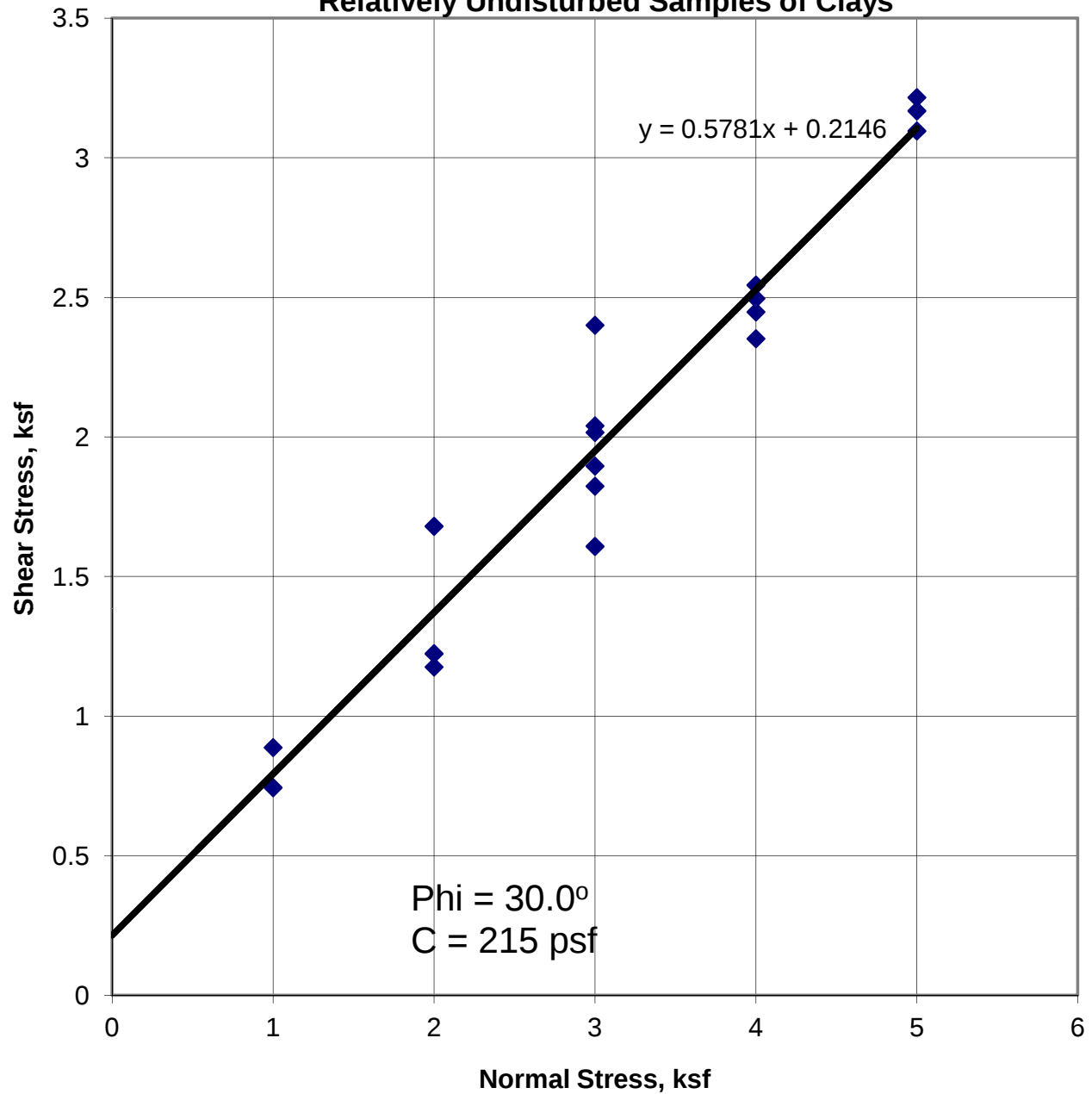
Vic Trace Reservoir  
Peak Strength Data for  
Relatively Undisturbed Samples of Qsb



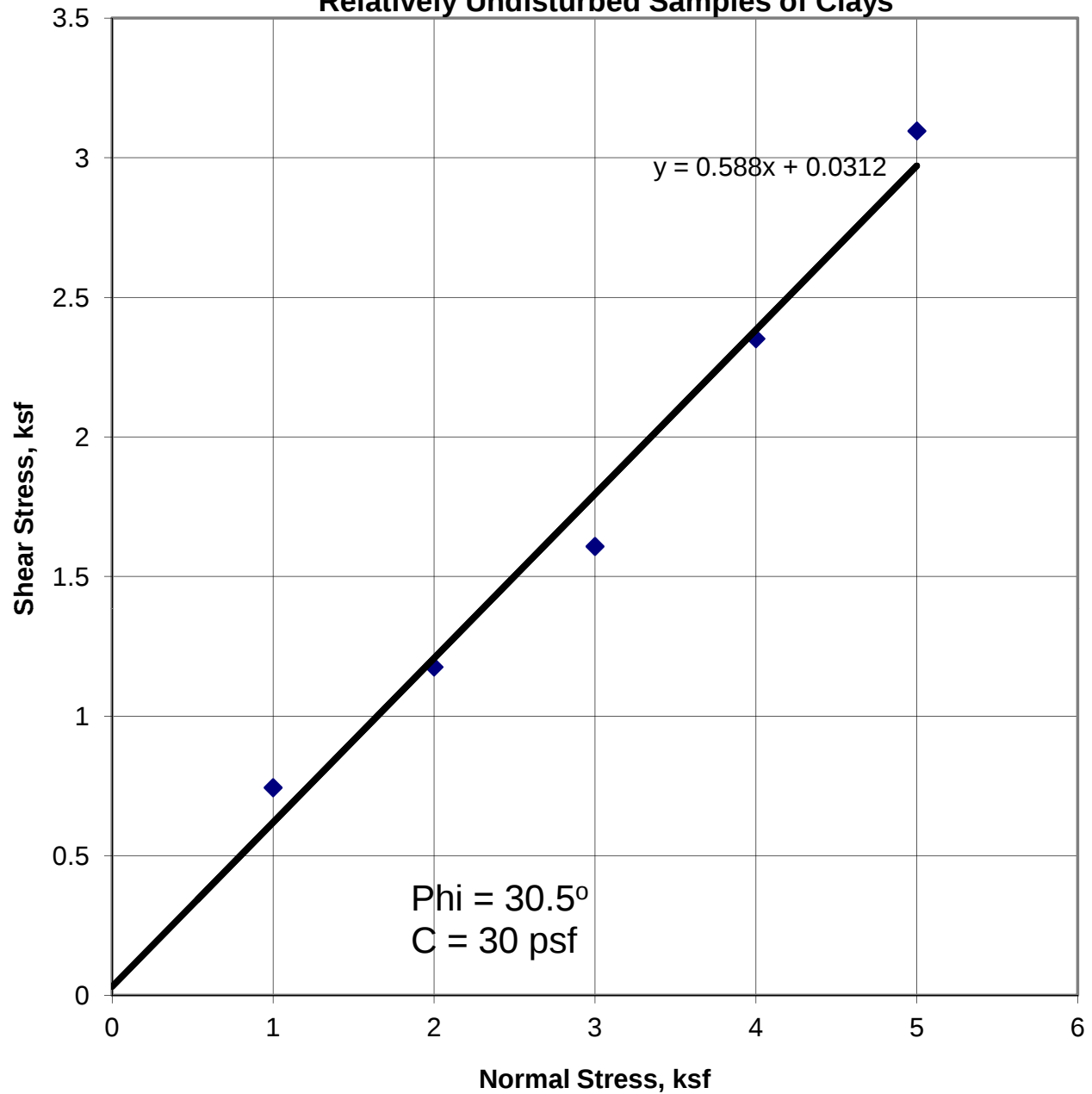
Vic Trace Reservoir  
Ultimate Strength Data for  
Relatively Undisturbed Samples of Qsb



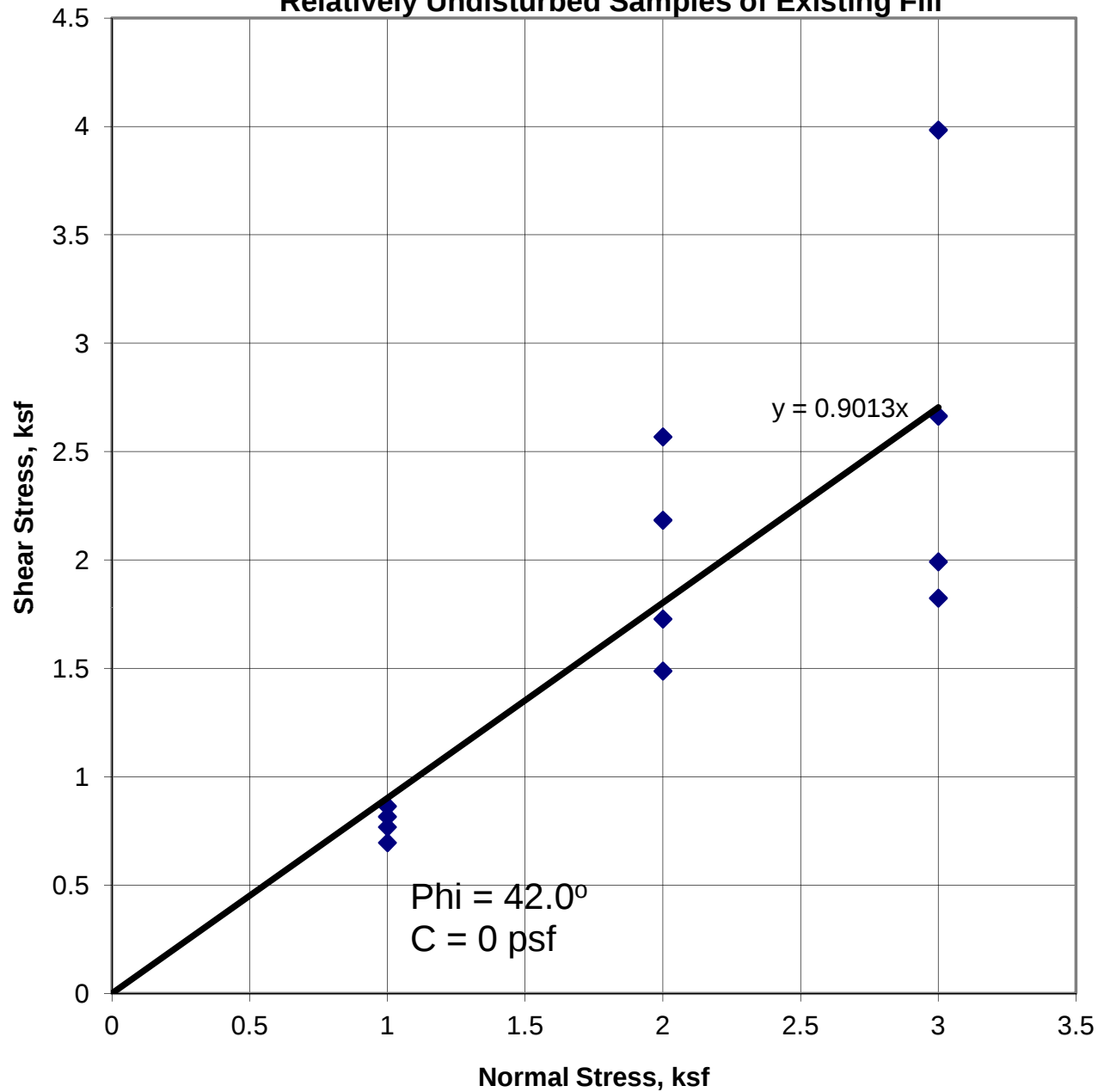
Vic Trace Reservoir  
Ultimate Strength Data for  
Relatively Undisturbed Samples of Clays



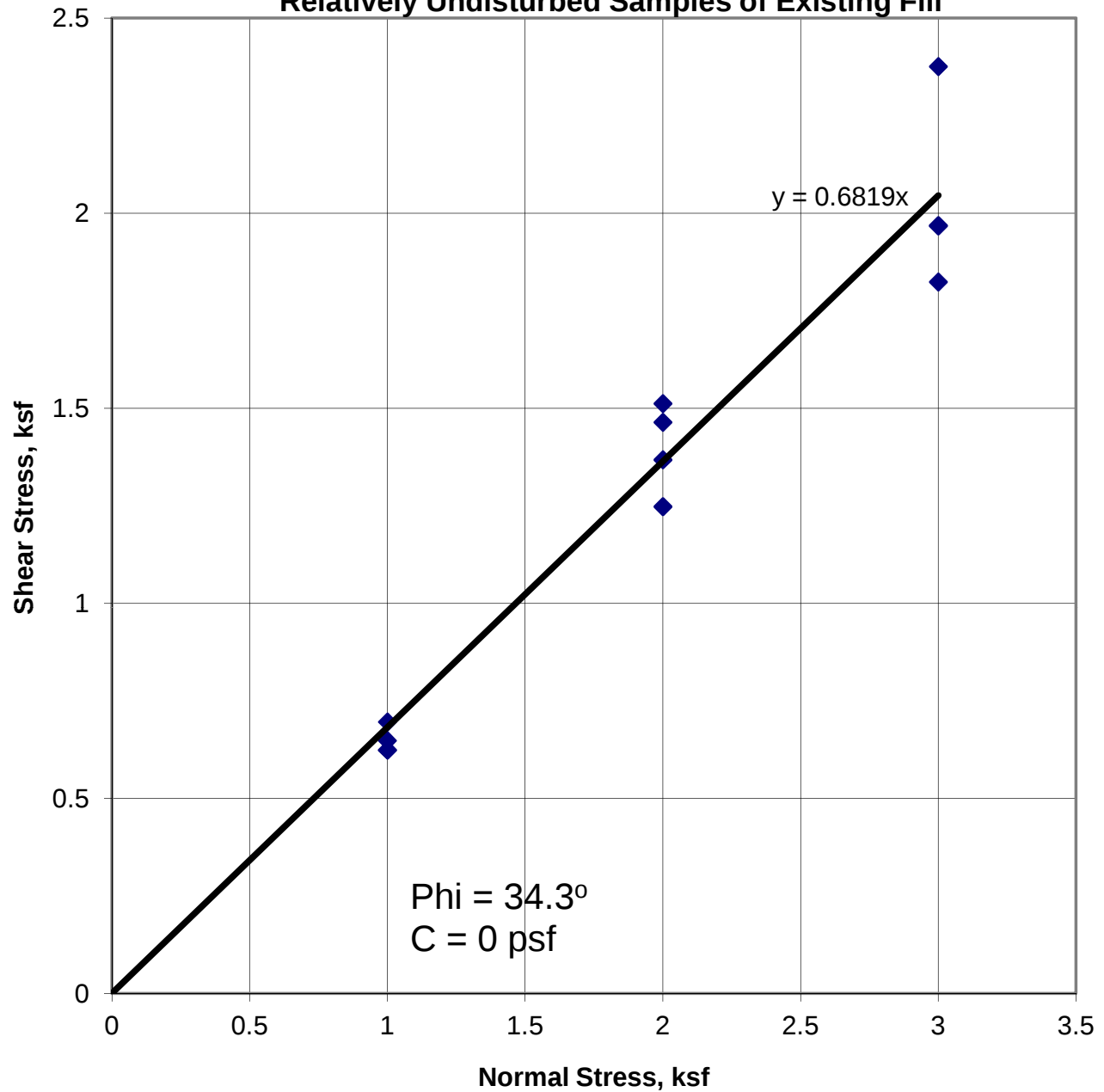
**Vic Trace Reservoir  
Lower Bound Ultimate Strength Data for  
Relatively Undisturbed Samples of Clays**



Vic Trace Reservoir  
Peak Strength Data for  
Relatively Undisturbed Samples of Existing Fill



**Vic Trace Reservoir  
Ultimate Strength Data for  
Relatively Undisturbed Samples of Existing Fill**



**TABLE 1809.7(1)**  
**PRESCRIPTIVE FOOTINGS FOR SUPPORTING WALLS OF LIGHT FRAME CONSTRUCTION\***

| WEIGHTED<br>EXPANSION INDEX<br>(13) | FOUNDATION FOR SLAB & RAISED FLOOR SYSTEM (4) (8) |                   |                  |                      |          |    |                                  |                                       |                                                              |                                                           | CONCRETE SLABS (8) (12)                                      |                                                                                                                | PREMOISTENING<br>OF SOILS UNDER<br>FOOTINGS, PIERS<br>AND SLABS (4) (5) | RESTRICTION ON<br>PIERS UNDER<br>RAISED FLOORS |
|-------------------------------------|---------------------------------------------------|-------------------|------------------|----------------------|----------|----|----------------------------------|---------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------|
|                                     | NUMBER<br>OF<br>STORIES                           | STEM<br>THICKNESS | FOOTING<br>WIDTH | FOOTING<br>THICKNESS | (INCHES) |    | ALL PERIMETER<br>FOOTINGS<br>(5) |                                       | INTERIOR<br>FOOTINGS<br>FOR SLAB<br>AND RAISED<br>FLOORS (5) | REINFORCEMENT<br>FOR CONTINUOUS<br>FOUNDATIONS (2)<br>(6) | 3-1/2" MINIMUM THICKNESS                                     |                                                                                                                |                                                                         |                                                |
|                                     |                                                   |                   |                  |                      |          |    | REINFORCEMENT<br>(3)             | TOTAL<br>THICKNESS<br>OF SAND<br>(10) |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
|                                     |                                                   |                   |                  |                      |          |    |                                  |                                       |                                                              |                                                           | DEPTH BELOW NATURAL<br>SURFACE OF GROUND AND<br>FINISH GRADE |                                                                                                                |                                                                         |                                                |
| 0 - 20 Very Low (non-<br>expansive) | 1                                                 | 6                 | 12               | 6                    | 6        | 12 | 12                               | 12                                    | 1-#4 top and bottom                                          | #4 @ 48" o.c. each<br>way, or #3 @ 36" o.c.<br>each way   | 2"                                                           | Moistening of ground<br>recommended prior to<br>placing concrete                                               | Piers allowed for<br>single floor loads<br>only                         |                                                |
|                                     | 2                                                 | 8                 | 15               | 6                    | 6        | 18 | 18                               | 18                                    | 1-#4 top and bottom                                          | #4 @ 48" o.c. each<br>way, or #3 @ 36" o.c.<br>each way   | 4"                                                           | 120% of optimum<br>moisture required to a<br>depth of 21" below<br>lowest adjacent grade.<br>Testing required. | Piers allowed for<br>single floor loads<br>only                         |                                                |
|                                     | 3                                                 | 10                | 18               | 8                    | 8        | 24 | 24                               | 24                                    | 1-#4 top and bottom                                          | #3 @ 24" o.c. each<br>way                                 | 4"                                                           | 130% of optimum<br>moisture required to a<br>depth of 27" below<br>lowest adjacent grade.<br>Testing required. | Piers not allowed                                                       |                                                |
| 21-50 Low                           | 1                                                 | 6                 | 12               | 6                    | 6        | 15 | 15                               | 12                                    | #3 bars @ 24" in ext. footing Bend 3' into slab (7)          | #3 @ 24" o.c. each<br>way                                 | 4"                                                           | 140% of optimum<br>moisture required to a<br>depth of 33" below<br>lowest adjacent grade.<br>Testing required. | Piers not allowed                                                       |                                                |
|                                     | 2                                                 | 8                 | 15               | 6                    | 6        | 18 | 18                               | 18                                    | 2-#4 Top and<br>Bottom                                       | #3 @ 24" o.c. each way                                    | 4"                                                           |                                                                                                                |                                                                         |                                                |
|                                     | 3                                                 | 10                | 18               | 8                    | 8        | 24 | 24                               | 24                                    | #3 bars @ 24" in ext. footing Bend 3' into slab (7)          |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
| 51-90 Medium                        | 1                                                 | 6                 | 12               | 6                    | 6        | 21 | 21                               | 12                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
|                                     | 2                                                 | 8                 | 15               | 6                    | 6        | 21 | 21                               | 18                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
|                                     | 3                                                 | 10                | 18               | 8                    | 8        | 27 | 27                               | 24                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
| 91-130 High                         | 1                                                 | 6                 | 12               | 6                    | 6        | 27 | 27                               | 12                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
|                                     | 2                                                 | 8                 | 15               | 6                    | 6        | 27 | 27                               | 18                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
|                                     | 3                                                 | 10                | 18               | 8                    | 8        | 27 | 27                               | 24                                    |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |
| Above 130 Very High                 |                                                   |                   |                  |                      |          |    |                                  |                                       |                                                              |                                                           |                                                              |                                                                                                                |                                                                         |                                                |

Special design by licensed engineer/architect

Special design by licensed engineer/architect

\*Refer to next page for footnotes (1) through (14).

## **APPENDIX C**

### **2010 CBC & ASCE 7-05 Seismic Parameters Fault Parameters**

### 2010 California Building Code (CBC) & ASCE 7-05 Seismic Parameters

|                          |            | CBC Reference  | ASCE 7-05 Reference |
|--------------------------|------------|----------------|---------------------|
| Seismic Design Category: | <b>D</b>   | Table 1613.5.6 | Table 11.6-1        |
| Site Class:              | <b>C</b>   | Table 1613.5.2 | Table 20.3-1        |
| Latitude:                | 34.405 N   |                |                     |
| Longitude:               | -119.716 W |                |                     |

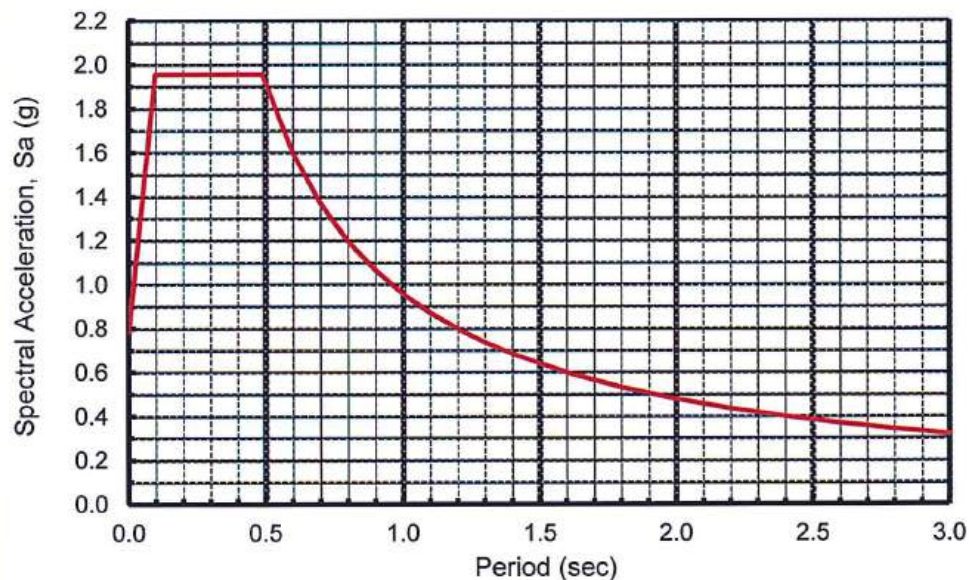
#### Maximum Considered Earthquake (MCE) Ground Motion

|                                |          |                |                   |              |
|--------------------------------|----------|----------------|-------------------|--------------|
| Short Period Spectral Response | $S_S$    | <b>1.955 g</b> | Figure 1613.5     | Figure 22-3  |
| 1 second Spectral Response     | $S_1$    | <b>0.737 g</b> | Figure 1613.5     | Figure 22.4  |
| Site Coefficient               | $F_a$    | 1.00           | Table 1613.5.3(1) | Table 11.4-1 |
| Site Coefficient               | $F_v$    | 1.30           | Table 1613.5.3(2) | Table 11-4.2 |
|                                | $S_{MS}$ | 1.955 g        | $= F_a * S_S$     |              |
|                                | $S_{M1}$ | 0.958 g        | $= F_v * S_1$     |              |

#### Design Earthquake Ground Motion

|                                |          |                |                           |              |
|--------------------------------|----------|----------------|---------------------------|--------------|
| Short Period Spectral Response | $S_{DS}$ | <b>1.303 g</b> | $= 2/3 * S_{MS}$          |              |
| 1 second Spectral Response     | $S_{D1}$ | <b>0.639 g</b> | $= 2/3 * S_{M1}$          |              |
|                                | $T_o$    | 0.10 sec       | $= 0.2 * S_{D1} / S_{DS}$ |              |
|                                | $T_s$    | 0.49 sec       | $= S_{D1} / S_{DS}$       |              |
| Seismic Importance Factor      | $I_E$    | 1.50           | Table 1604.5              | Table 11.5-1 |

**2010 CBC (ASCE 7-05) Equivalent Static Response Spectrum**



| Period<br>T (sec) | Sa<br>(g) |
|-------------------|-----------|
| 0.00              | 0.782     |
| 0.05              | 1.380     |
| 0.10              | 1.955     |
| 0.20              | 1.955     |
| 0.30              | 1.955     |
| 0.49              | 1.955     |
| 0.60              | 1.597     |
| 0.70              | 1.369     |
| 0.80              | 1.198     |
| 0.90              | 1.065     |
| 1.00              | 0.958     |
| 1.10              | 0.871     |
| 1.20              | 0.798     |
| 1.30              | 0.737     |
| 1.40              | 0.684     |
| 1.60              | 0.599     |
| 1.80              | 0.532     |
| 2.00              | 0.479     |
| 2.20              | 0.436     |
| 2.40              | 0.399     |
| 2.60              | 0.369     |

**Fault Parameters  
& Deterministic Estimates of Mean Peak Ground Acceleration (PGA)**

| Fault Name or<br>Seismic Zone    | Distance<br>from Site |      | Fault<br>Type |     | Maximum<br>Magnitude<br>Mmax<br>(Mw) | Avg<br>Slip<br>Rate<br>(mm/yr) | Avg<br>Return<br>Period<br>(yrs) | Fault<br>Length<br>(km) | Mean<br>Site<br>PGA<br>(g) |
|----------------------------------|-----------------------|------|---------------|-----|--------------------------------------|--------------------------------|----------------------------------|-------------------------|----------------------------|
|                                  | (mi)                  | (km) | (2)           | (3) | (4)                                  | (2)                            | (2)                              | (2)                     | (5)                        |
| Reference Notes: (1)             |                       |      |               |     |                                      |                                |                                  |                         |                            |
| North Channel Slope              | 0.1                   | 0.2  | BT            | B   | 7.4                                  | 2                              | 605                              | 68                      | 0.71                       |
| M.Ridge-Arroyo Parida-Santa Ana  | 2.8                   | 4.6  | RV            | B   | 7.2                                  | 0.4                            | 1076                             | 69                      | 0.57                       |
| Red Mountain                     | 3.5                   | 5.6  | RV            | B   | 7.0                                  | 2                              | 507                              | 39                      | 0.51                       |
| Montalvo-Oak Ridge Trend         | 5.5                   | 8.8  | BT            | C   | 6.6                                  | 1                              | 730                              | 37                      | 0.36                       |
| Santa Ynez (West)                | 6.2                   | 9.9  | SS            | B   | 7.1                                  | 2                              | 495                              | 65                      | 0.31                       |
| Santa Ynez (East)                | 6.7                   | 10.8 | SS            | B   | 7.1                                  | 2                              | 669                              | 68                      | 0.30                       |
| Channel Is. Thrust (Eastern)     | 9.1                   | 14.6 | BT            | C   | 7.5                                  | 1.5                            | 1420                             | 63                      | 0.37                       |
| Ventura - Pitas Point            | 10.2                  | 16.4 | RV            | B   | 6.9                                  | 1                              | 1112                             | 40                      | 0.27                       |
| Oak Ridge(Blind Thrust Offshore) | 16.1                  | 25.9 | BT            | C   | 7.1                                  | 3                              | 377                              | 39                      | 0.20                       |
| Anacapa-Dume                     | 21.1                  | 34.0 | RV            | B   | 7.5                                  | 3                              | 529                              | 75                      | 0.20                       |
| Los Alamos-W. Baseline           | 25.3                  | 40.7 | RV            | B   | 6.9                                  | 0.7                            | 1512                             | 28                      | 0.12                       |
| Big Pine                         | 25.3                  | 40.7 | SS            | B   | 6.9                                  | 0.8                            | 984                              | 41                      | 0.09                       |
| Santa Cruz Island                | 26.8                  | 43.1 | SS            | B   | 7.0                                  | 1                              | 912                              | 50                      | 0.09                       |
| Santa Rosa Island                | 28.5                  | 45.8 | SS            | B   | 7.1                                  | 1                              | 1130                             | 57                      | 0.09                       |
| Oak Ridge (Onshore)              | 31.1                  | 50.0 | RV            | B   | 7.0                                  | 4                              | 299                              | 49                      | 0.11                       |
| San Cayetano                     | 31.3                  | 50.4 | RV            | B   | 7.0                                  | 6                              | 150                              | 42                      | 0.11                       |
| Simi-Santa Rosa                  | 33.9                  | 54.5 | RV            | B   | 7.0                                  | 1                              | 933                              | 40                      | 0.10                       |
| Lions Head                       | 35.8                  | 57.6 | RV            | B   | 6.6                                  | 0.02                           | 36230                            | 41                      | 0.07                       |
| Pleito                           | 40.3                  | 64.9 | RV            | B   | 7.0                                  | 2                              | 706                              | 44                      | 0.08                       |
| San Andreas - 1857 Rupture       | 40.9                  | 65.8 | SS            | A   | 7.8                                  | 34                             | 206                              | 312                     | 0.10                       |
| San Luis Range (S. Margin)       | 42.7                  | 68.7 | RV            | B   | 7.2                                  | 0.2                            | 6600                             | 64                      | 0.09                       |
| Casmalia (Orcutt Frontal Fault)  | 47.0                  | 75.6 | RV            | B   | 6.5                                  | 0.25                           | 2901                             | 29                      | 0.05                       |
| Malibu Coast                     | 50.0                  | 80.5 | RV            | B   | 6.7                                  | 0.3                            | 2908                             | 37                      | 0.06                       |
| San Gabriel                      | 52.3                  | 84.2 | SS            | B   | 7.2                                  | 1                              | 1264                             | 72                      | 0.06                       |
| San Juan                         | 53.1                  | 85.5 | SS            | B   | 7.1                                  | 1                              | 1338                             | 68                      | 0.05                       |
| Northridge (E. Oak Ridge)        | 53.8                  | 86.6 | BT            | C   | 7.0                                  | 1.5                            | 818                              | 31                      | 0.06                       |
| Garlock (West)                   | 54.1                  | 87.0 | SS            | A   | 7.3                                  | 6                              | 1000                             | 98                      | 0.06                       |
| Santa Susana                     | 54.1                  | 87.1 | RV            | B   | 6.7                                  | 5                              | 138                              | 27                      | 0.05                       |
| Holser                           | 54.9                  | 88.3 | RV            | B   | 6.5                                  | 0.4                            | 1876                             | 20                      | 0.04                       |
| White Wolf                       | 55.5                  | 89.4 | RV            | B   | 7.3                                  | 2                              | 839                              | 67                      | 0.07                       |
| Los Osos                         | 61.3                  | 98.6 | RV            | B   | 7.0                                  | 0.5                            | 1925                             | 44                      | 0.05                       |

## Notes:

- Jennings (1994) and California Geologic Survey (CGS) (2003)
- CGS (2003), SS = Strike-Slip, RV = Reverse, DS = Dip Slip (normal), BT = Blind Thrust
- 2001 CBC, where Type A faults: Mmax > 7 & slip rate > 5 mm/yr & Type C faults: Mmax < 6.5 & slip rate < 2 mm/yr
- CGS (2003)
- The estimates of the mean Site PGA are based on the following attenuation relationships:  
Average of: (1) 1997 Boore, Joyner & Fumal; (2) 1997 Sadigh et al; (3) 1997 Campbell, (4) 1997 Abrahamson & Silva  
(mean plus sigma values are about 1.5 to 1.6 times higher)  
Based on Site Coordinates: 34.405 N Latitude, 119.716 W Longitude and Site Soil Type C

## **APPENDIX D**

Geophysical Survey Report  
By GeoSite Locators (August 9, 2013)



2036 Nevada City Highway, #305  
Grass Valley, CA 95959

## Geophysical Survey Report

of  
Trace Reservoir  
Santa Barbara, CA

Prepared For:  
Earth Systems Pacific  
Walter St.  
Ventura, CA

Prepared By:  
Geo Site Locators  
2036 Nevada City Hwy #305  
Grass Valley, Ca 95945

8-09-13

p) 805-844-3401 f) 530-292-3521 e) richsoto1@gmail.com

## INTRODUCTION

Geo Site Locators has been contracted by Earths Systems Pacific in Ventura, CA to use Ground Penetrating Radar to survey the top asphalt and surrounding dam the Trace Reservoir locate existing voids within the dam due to deterioration from water at that site. Geophysical methodology and equipment used, analyses and findings are described in the following paragraphs.

## GEOPHYSICAL METHODOLOGY AND EQUIPMENT

Geophysical Survey Systems SIR 3000 Utility Scan Ground Penetrating Radar (GPR) System with 270 MHz antenna was used to survey the site area. GPR survey scan sends a dielectric signal into the ground. This signal registers with the density of the soil which establishes the rate of penetration. Any other material or lack thereof of varied density will either speed up the signal or slow it down leaving either a hyperbola signature or show extreme black and white signatures within the gray spectrum. The hyperbola signatures in this survey represent the location of the utility lines or other anomaly and extreme variations in the gray spectrum represent voids in the site. The GPR equipment can register most materials such as concrete, PVC, steel, electrical currents, air voids, moisture, water tables and variations in ground composition.

## SITE AREA

For the purpose of the geophysical survey using GPR, the Site has been sectioned off into stationing marked at 50' intervals. All anomalies found are referenced from these station locations. Lateral scans were taken at 10' intervals

## ANALYSES / INTERPRETATIONS AND FINDINGS

The images and photos associated with geophysical survey results are presented in the following pages. The results of findings from geophysical survey interpretations are based on GPR scans confirming presence of something other than compacted soil.

Care has been taken to eliminate from this survey those hyperbola shaped figures that were questionable as to their origin and show no consistency in signature on the GPR monitor. Low frequency radio waves had some effect on the GPR equipment however during the survey, the ground conditions varied but allowed for our equipment to penetrate up to 5' to 10'. The steepness of the grade made scanning on the side of the dam presented difficulties leaving this data questionable in some areas.

The following figures of scans and correlating photos explain the findings. The asphalt portion of the dam survey was performed on 8-06-13

## Table of contents

| Location | Station Location | Figure  | Photo | Page |
|----------|------------------|---------|-------|------|
| 1        | 1+50             | 1       | 1     | 4    |
| 2        | 1+74             | 2       | 2     | 5    |
| 3        | 1+75-1+80        | 3       | 3     | 6    |
| 4        | 1+94             | 4       | 4     | 7    |
| 5        | 1+95             | 5       | 5     | 8    |
| 6        | 2+02-2+17        | 6       | 6     | 9    |
| 7        | 2+36-2+66        | 7       | 7     | 10   |
|          |                  |         | 8     | 11   |
| 8        | 3+61-3+82        | 8       | 9     | 12   |
| 9        | 6+36-6+69        | 9       | 10    | 13   |
| “        | “                | 10      | 11    | 14   |
| “        | “                |         | 12&13 | 15   |
| “        | “                | 11      | 14    | 16   |
|          | 1+00 & 3+00      | 12 & 13 |       | 17   |
|          | 4+50 & 5+50      | 14 & 15 |       | 18   |
|          | 7+50 & 8+50      | 16 & 17 |       | 19   |
|          | 9+50 & 11+00     | 18 & 19 |       | 20   |
|          | 12+00 & 13+00    | 20 & 21 |       | 21   |

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
| 1       | 1+50             | 4'+   | Void |

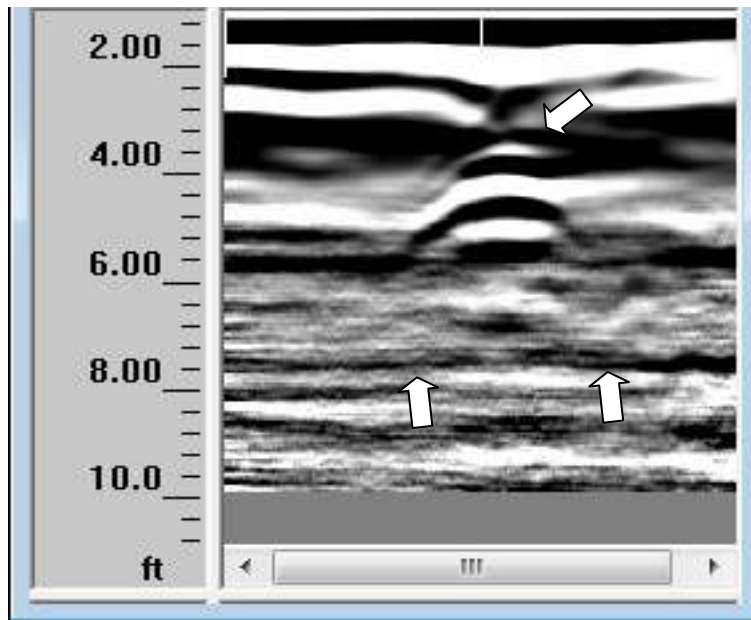


Figure 1



Photo 1

The scan in Figure 1 shows a variation in the soil around the dam. Low frequency interference caused the static from 5' down on the monitor as shown in Figure 1. However void areas can still be identified below 5'.

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
| 2       | 1+74             | 3'    | Pipe |

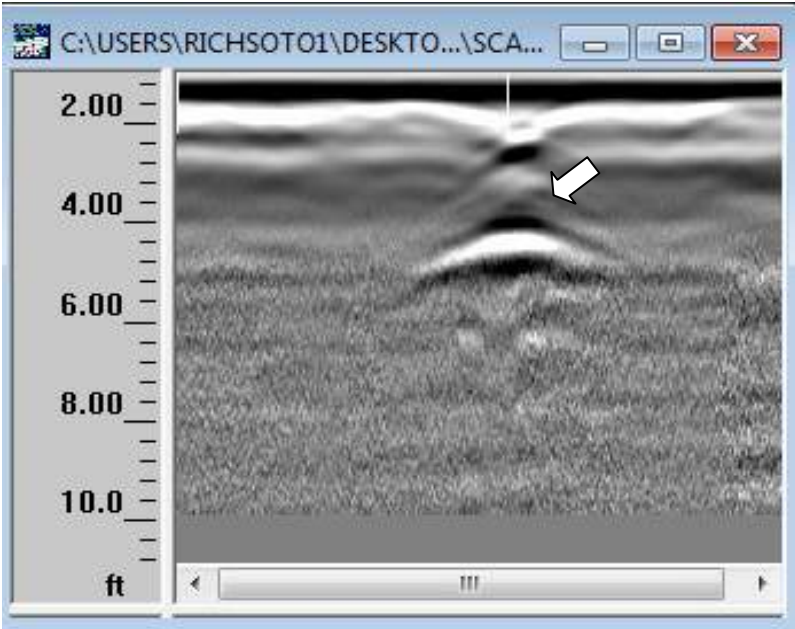


Figure 2



Photo 2

| Finding | Station Location | Depth     | Type |
|---------|------------------|-----------|------|
| 3       | 1+75-1+80        | Surface + | Void |

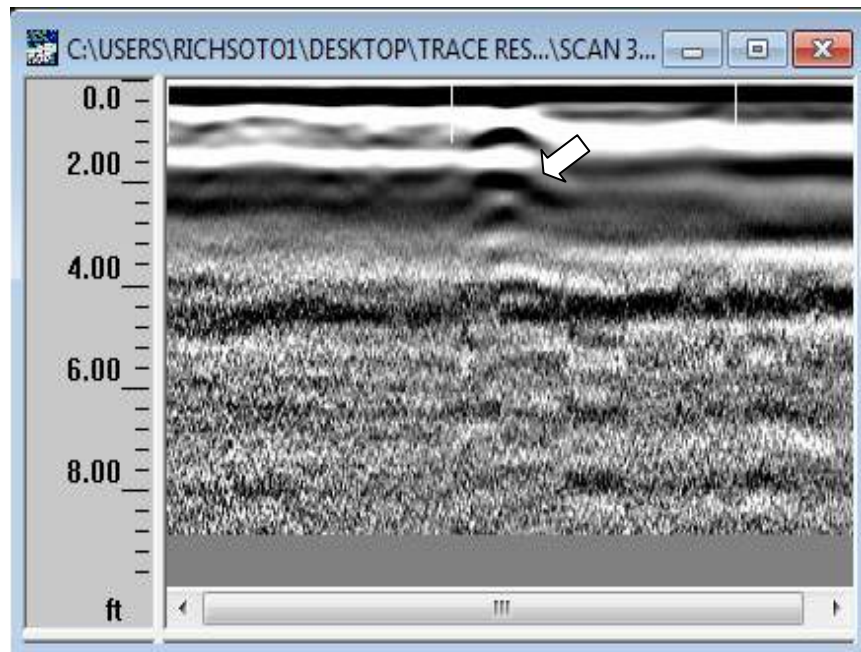


Figure 3



Photo 3

Arrows point to depression in the asphalt where void area is.

| Finding | Station Location | Depth | Type       |
|---------|------------------|-------|------------|
| 4       | 1+94             | 3"    | Electrical |

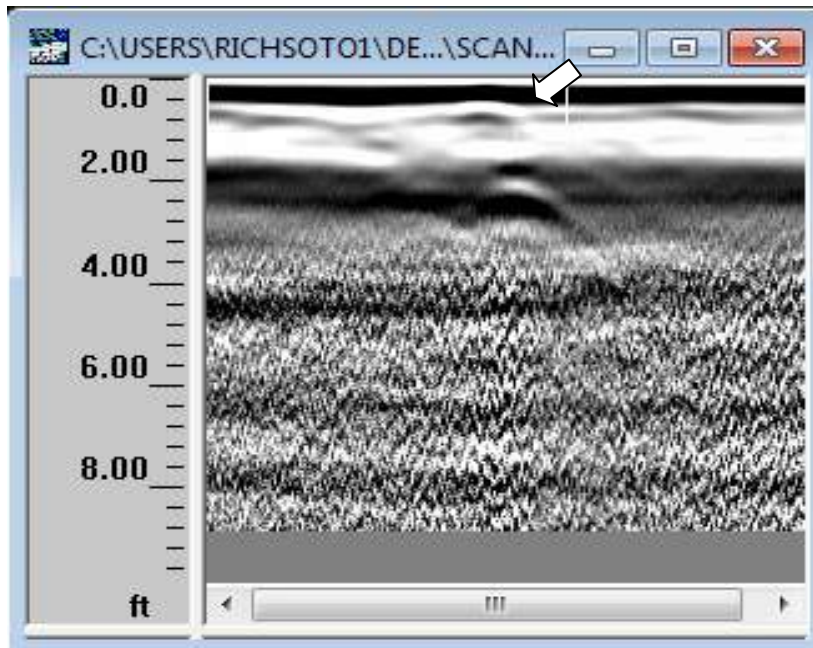


Figure 4



Photo 4

| Finding | Station Location | Depth | Type    |
|---------|------------------|-------|---------|
| 5       | 1+95             | 3'    | Unknown |

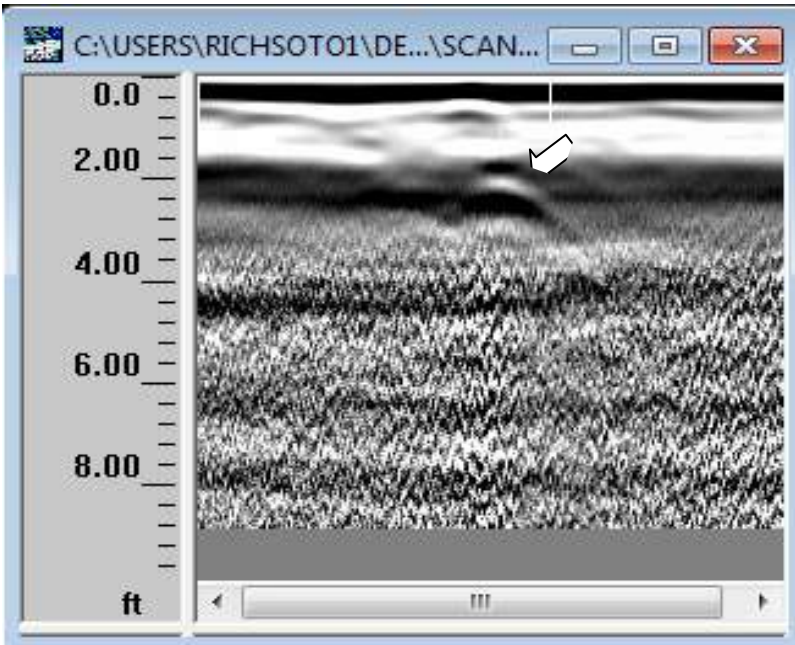


Figure 5



Photo 5

| Finding | Station Location | Depth | Type            |
|---------|------------------|-------|-----------------|
| 6       | 2+02-2+17        | '     | Area of Concern |

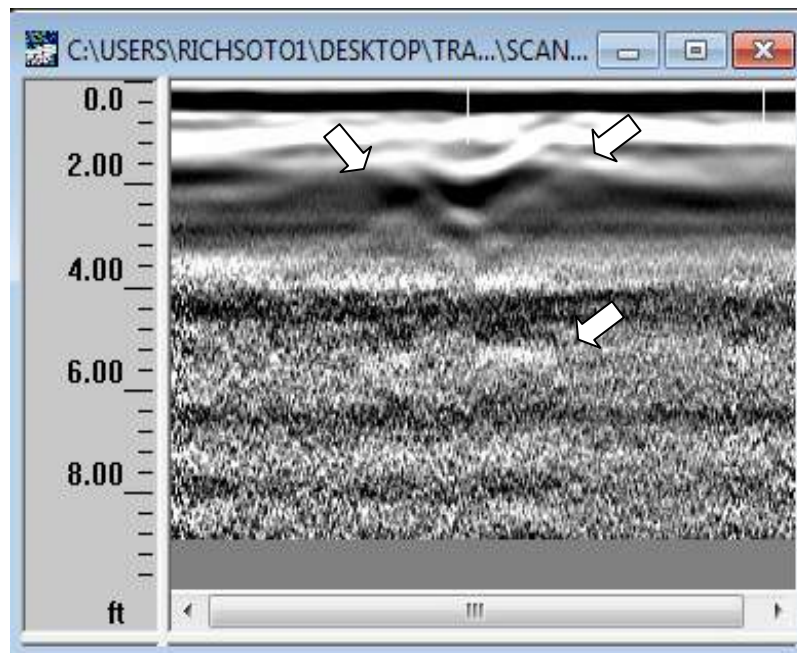


Figure 6



Photo 6

The scan in Figure 6 shows an area between the arrows having a variation in the soil from surrounding area. This may be a future trouble location.

| Finding | Station Location | Depth | Type            |
|---------|------------------|-------|-----------------|
| 7       | 2+56-2+66        | 4.5'  | Area of Concern |

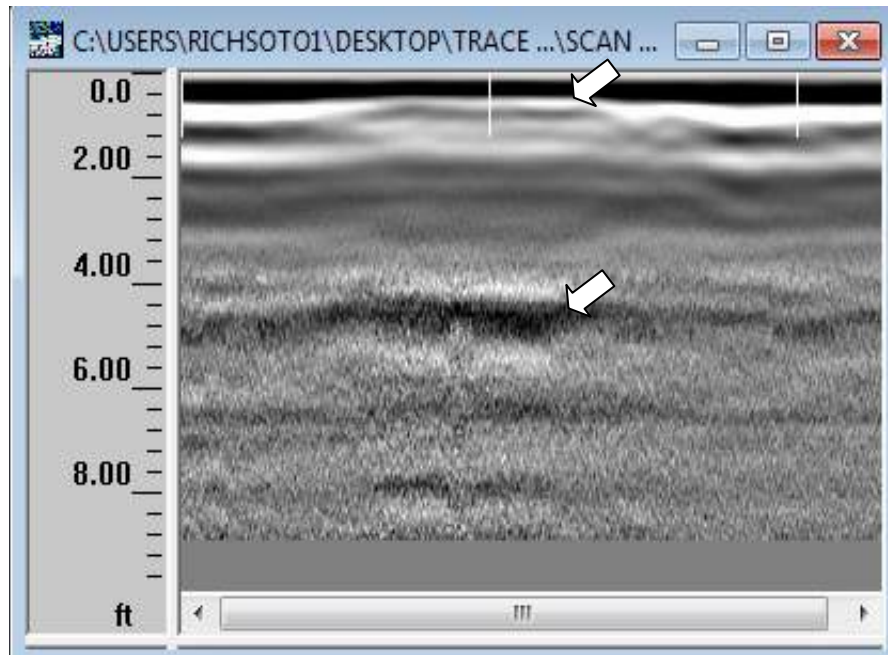


Figure 7



Photo 7

Scan in Figure 7 along the surface (top) shows an alteration from the soil just below the asphalt. Similarly there is an area at 4" that may be a void. Photo 8 may show why this condition exists.



Photo 8

Adjacent to Location 7, the rain drainage system has a large opening where water is entering the soil below.

| Finding | Station Location | Depth | Type            |
|---------|------------------|-------|-----------------|
| 8       | 3+61-3+82        | 3'    | Area of Concern |

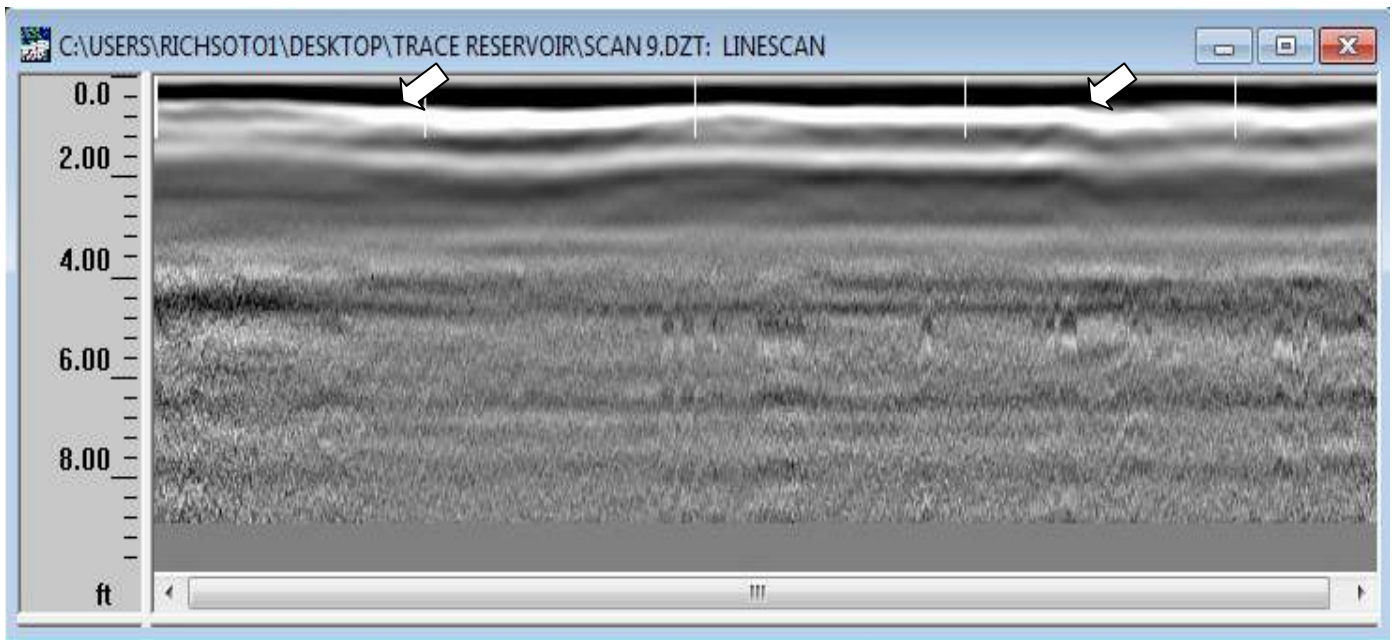


Figure 8



Photo 9

While not a problem area yet. It is clear that water is sitting in this area for long periods of time and beginning to erode under the asphalt as shown in Figure 8.

The following scans and photos are of the large sink holes in the southeast side of the reservoir.

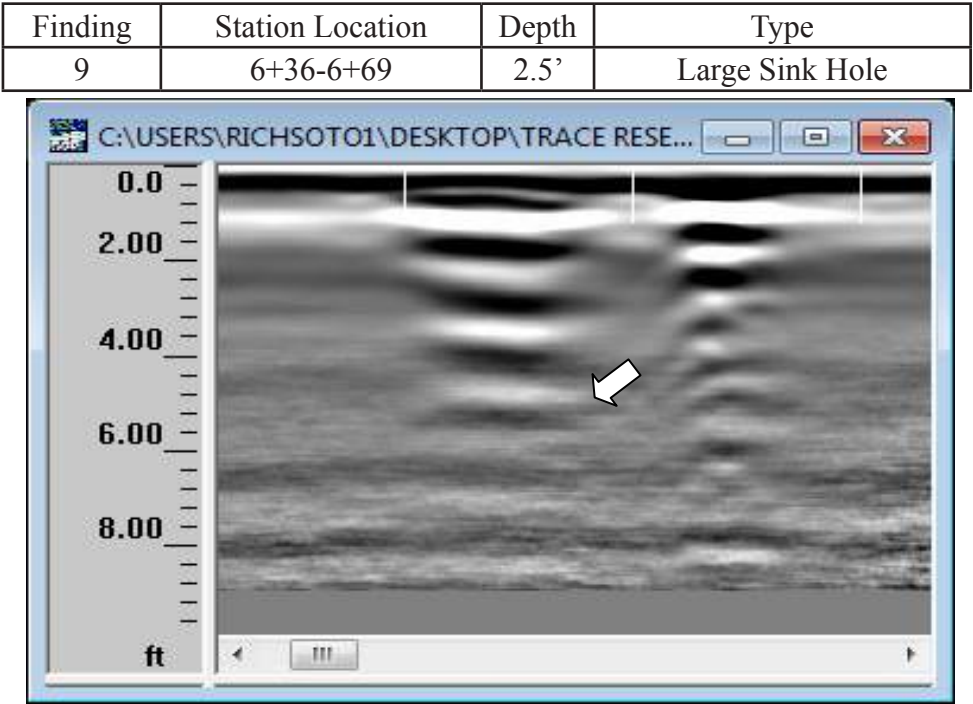


Figure 9



Photo 10

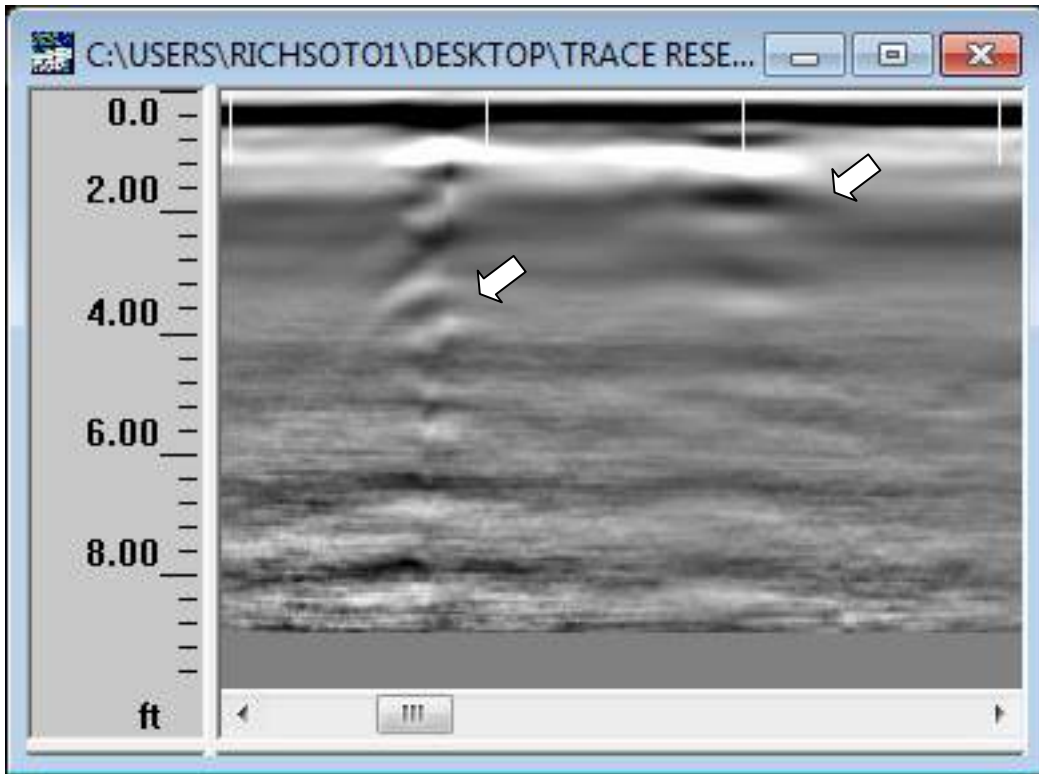


Figure 10



Photo 11

Left arrow in Photo 11 is represented by the right arrow in Figure 10. Photo 12 shows the void under the drain system.



Photo 12



Photo 13

Photo 13 shows a 1"+ off set at the bottom of the drainage system. The void in Photo 12 originates appears to this location.

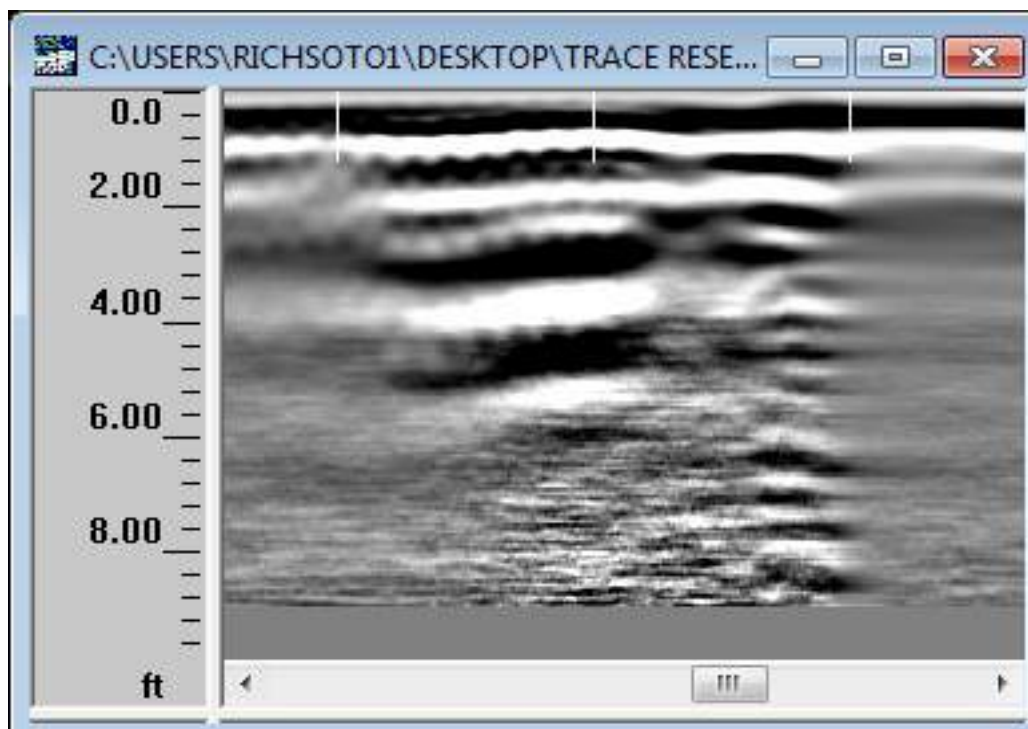


Figure 11



Photo 14

The following locations are of three scans per side of the reservoir where there appears to be no damage. No photos accompany these scans. What is of interest in these scans is the consistency of the soil as represented in the scans.

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 1+00             |       |      |

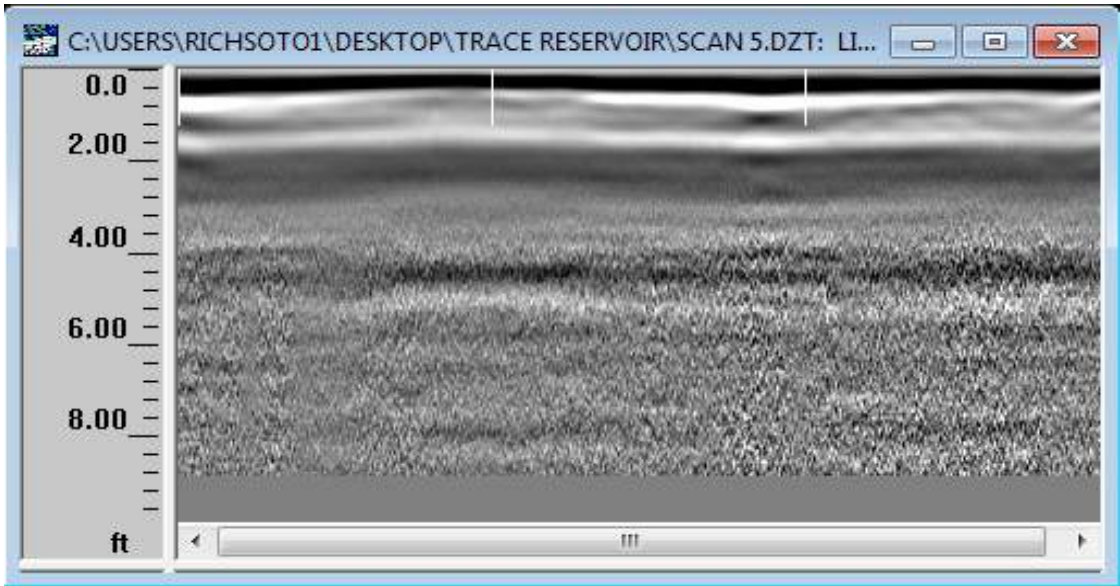


Figure 12

Station 2+00 is location 6 in this report.

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 3+00             |       |      |

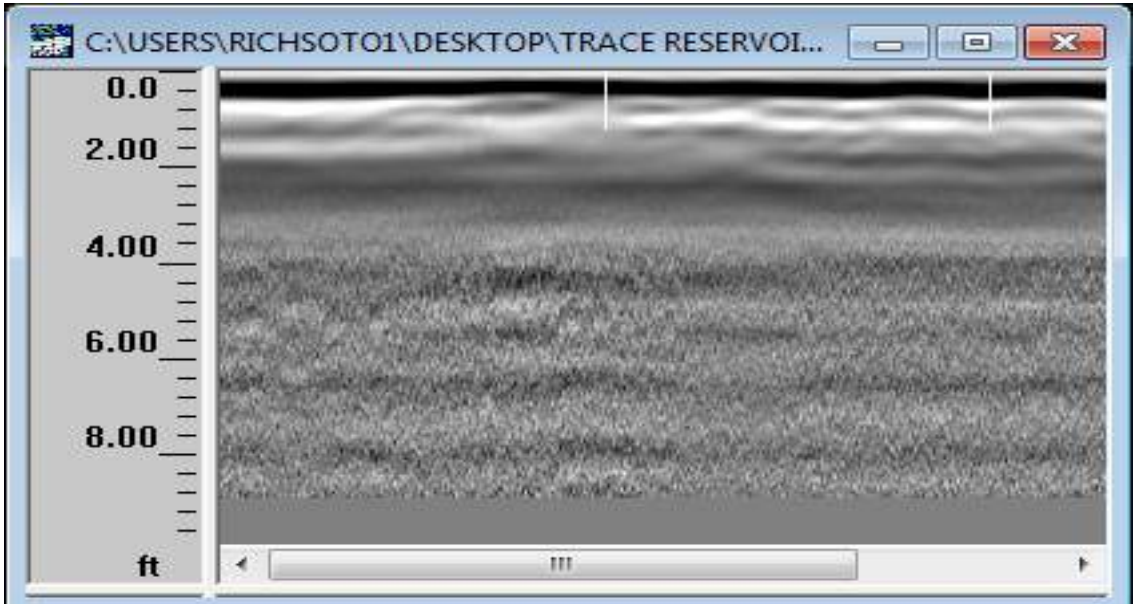


Figure 13

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 4+50             |       |      |

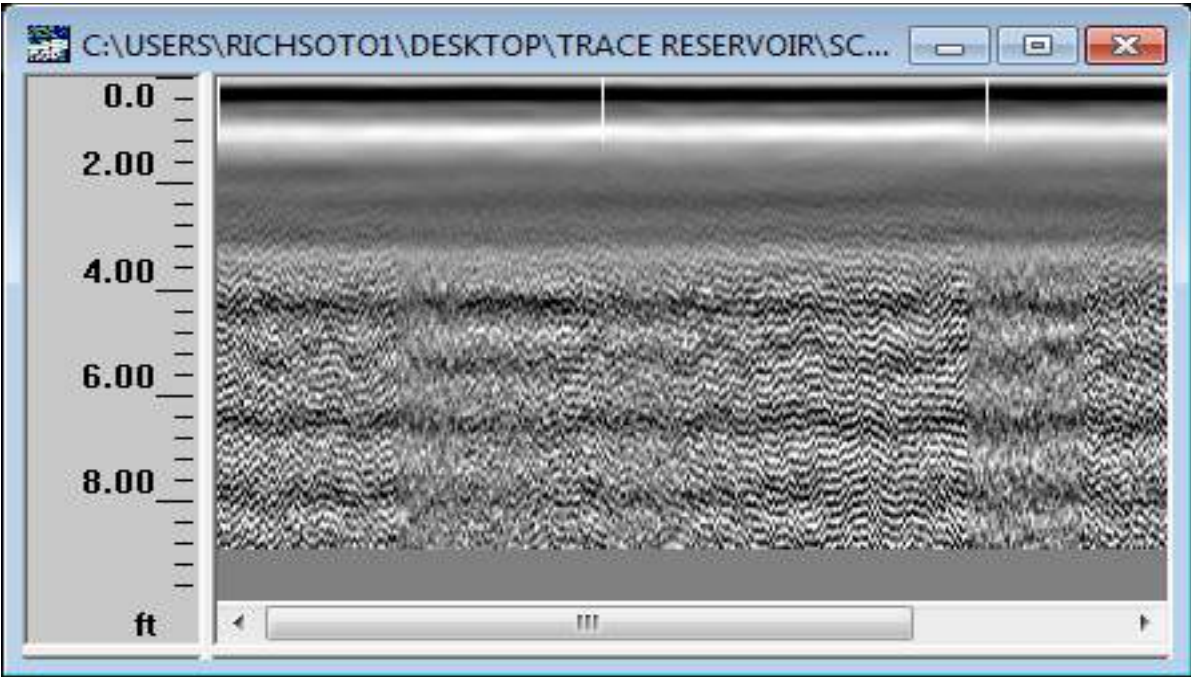


Figure 14

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 5+50             |       |      |

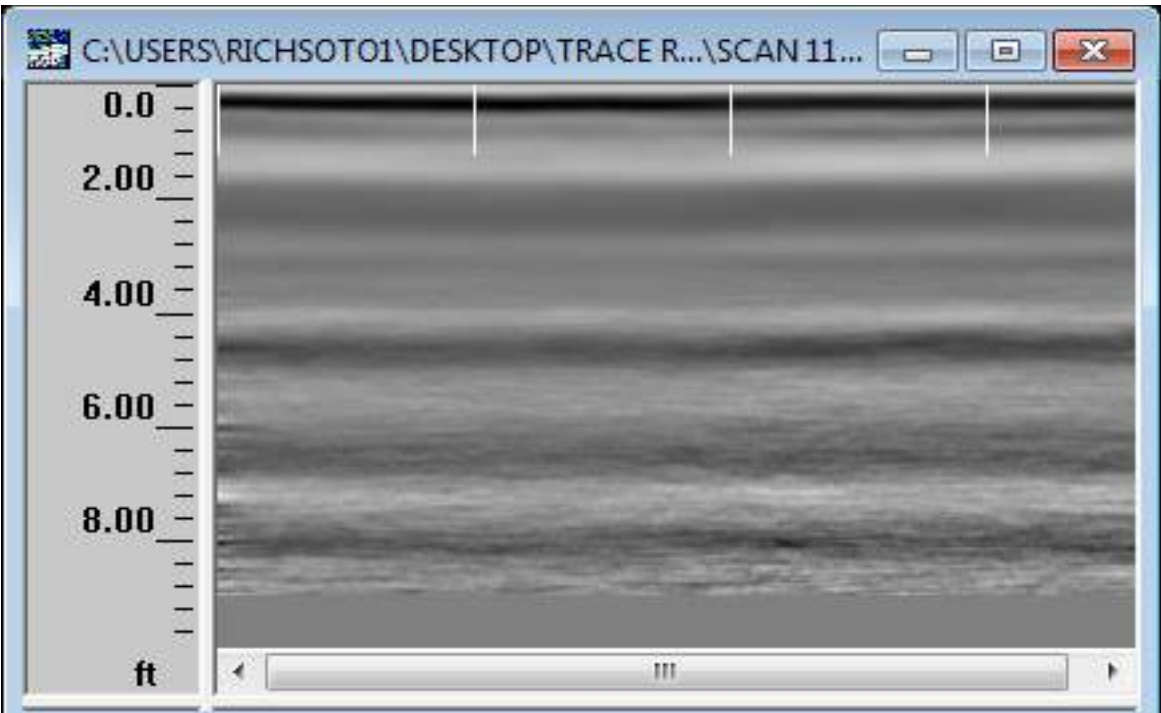


Figure 15

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 7+50             |       |      |

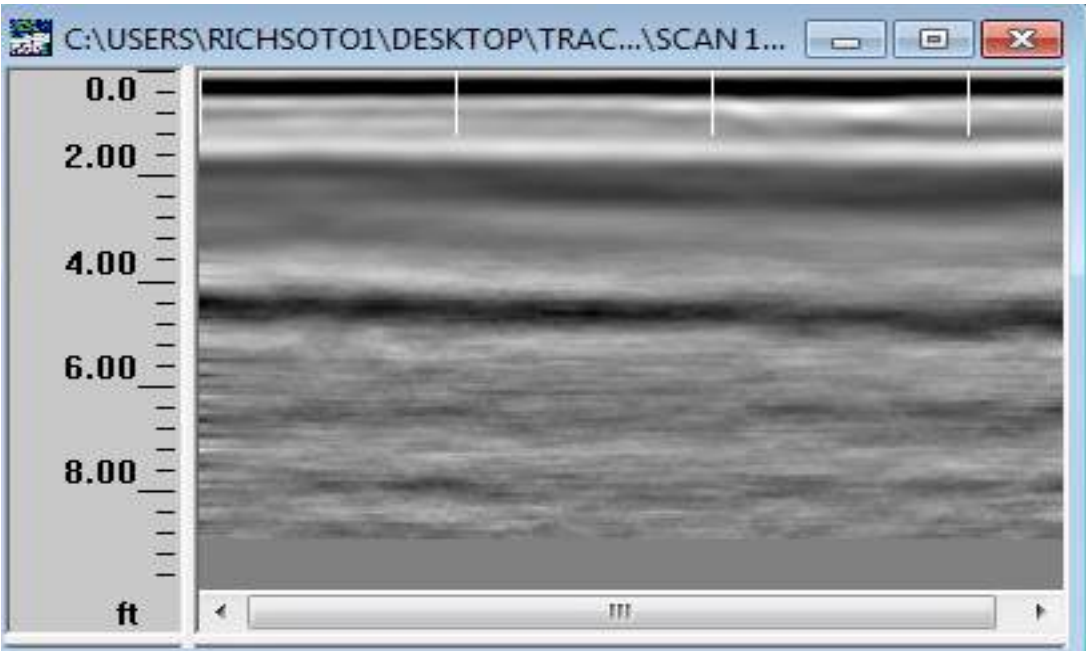


Figure 16

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 8+50             |       |      |

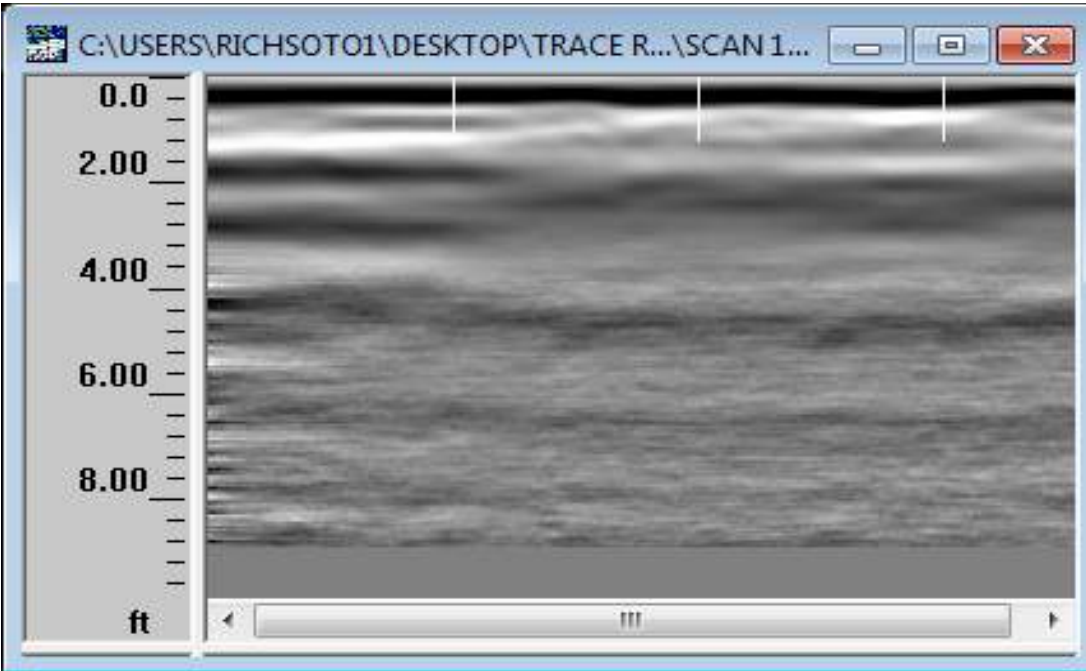


Figure 17

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 9+50             |       |      |

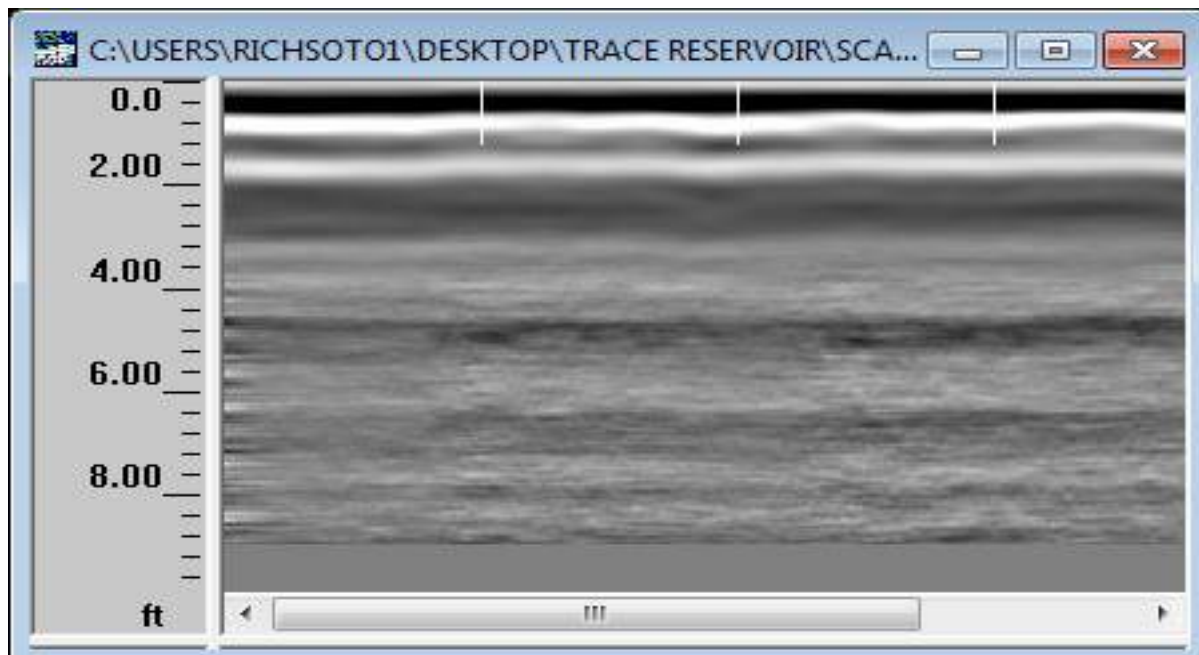


Figure 18

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 11+00            |       |      |



Figure 19

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 12+00            |       |      |

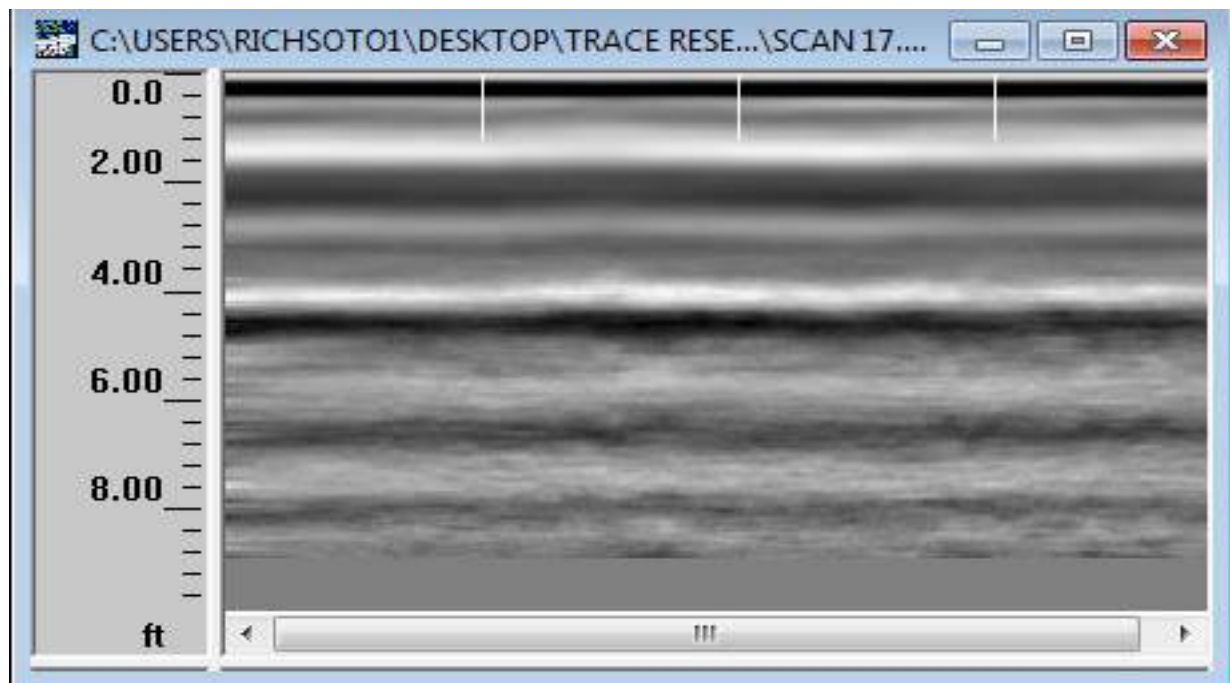


Figure 20

| Finding | Station Location | Depth | Type |
|---------|------------------|-------|------|
|         | 13+00            |       |      |

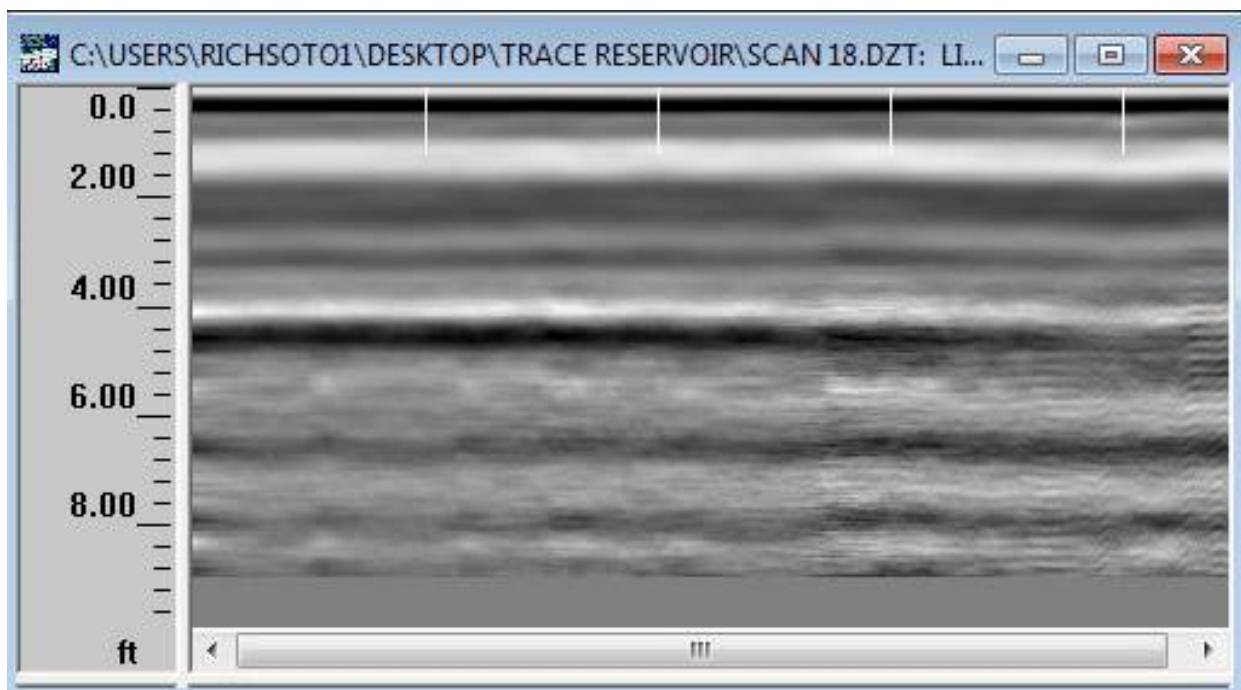


Figure 21

## **APPENDIX E**

Plots of Slopes Analyzed for Stability  
GSTABL7 Stability Analysis Printouts  
Surficial Stability Analysis Printouts

\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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\*\*\*\*\*

## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/23/2013  
 Time of Run: 03:44PM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vttrastat.  
 Output Filename: C:\GSTABL7 DATA\vttrastat.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vttrastat.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Static Analysis along A-A'

## BOUNDARY COORDINATES

9 Top Boundaries

10 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 352.00      | 50.00        | 355.00       | 1                   |
| 2            | 50.00       | 355.00      | 90.00        | 370.00       | 1                   |
| 3            | 90.00       | 370.00      | 235.00       | 410.00       | 2                   |
| 4            | 235.00      | 410.00      | 390.00       | 450.00       | 2                   |
| 5            | 390.00      | 450.00      | 425.00       | 464.00       | 2                   |
| 6            | 425.00      | 464.00      | 440.00       | 464.00       | 2                   |
| 7            | 440.00      | 464.00      | 460.00       | 454.00       | 2                   |
| 8            | 460.00      | 454.00      | 480.00       | 444.00       | 1                   |
| 9            | 480.00      | 444.00      | 600.00       | 444.00       | 1                   |
| 10           | 90.00       | 370.00      | 460.00       | 454.00       | 1                   |

User Specified Y-Origin = 300.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Pore Pressure Param. (psf) | Pressure Constant (psf) | Piez. Surface No. |
|---------------|----------------------|--------------------------|--------------------------|----------------------|----------------------------|-------------------------|-------------------|
| 1             | 117.7                | 128.5                    | 170.0                    | 30.6                 | 0.00                       | 0.0                     | 0                 |
| 2             | 122.7                | 132.5                    | 0.0                      | 34.3                 | 0.00                       | 0.0                     | 0                 |

## ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 Is Anisotropic

Number Of Direction Ranges Specified = 3

| Direction Range No. | Counterclockwise Direction Limit (deg) | Cohesion Intercept (psf) | Friction Angle (deg) |
|---------------------|----------------------------------------|--------------------------|----------------------|
| 1                   | 10.0                                   | 170.00                   | 30.60                |
| 2                   | 14.0                                   | 30.00                    | 30.50                |
| 3                   | 90.0                                   | 170.00                   | 30.60                |

## ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.274(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

EARTHQUAKE DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

The Active And Passive Portions Of The Sliding Surfaces Are Generated According To The Rankine Theory.

500 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base  
Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

| Box No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Height (ft) |
|---------|-------------|-------------|--------------|--------------|-------------|
| 1       | 100.00      | 358.70      | 120.00       | 363.00       | 26.00       |
| 2       | 300.00      | 401.20      | 460.00       | 436.30       | 30.00       |

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Simplified Janbu Method \* \*

Total Number of Trial Surfaces Attempted = 500

Number of Trial Surfaces With Valid FS = 500

Statistical Data On All Valid FS Values:

FS Max = 3.317 FS Min = 2.325 FS Ave = 2.478

Standard Deviation = 0.215 Coefficient of Variation = 8.68 %

Failure Surface Specified By 6 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
| 1         | 105.921     | 374.392     |
| 2         | 106.950     | 373.848     |
| 3         | 115.980     | 368.698     |
| 4         | 414.639     | 438.769     |
| 5         | 417.871     | 444.436     |
| 6         | 428.208     | 464.000     |

Factor of Safety

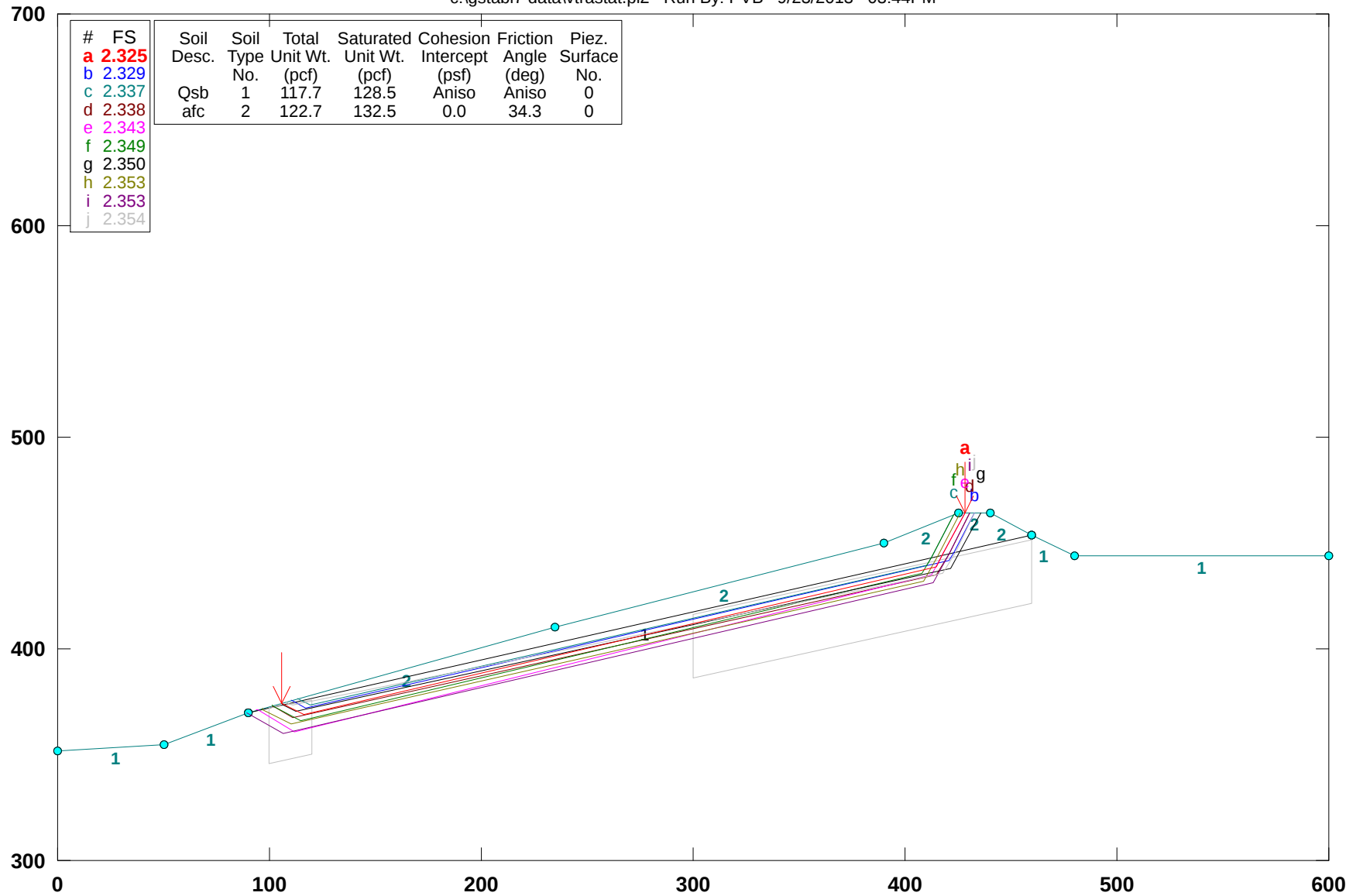
\*\*\* 2.325 \*\*\*

Individual data on the 8 slices

| Slice No. | Width (ft) | Weight (lbs) | Water Force Top (lbs) | Water Force Bot (lbs) | Tie Force Norm (lbs) | Tie Force Tan (lbs) | Earthquake Force Hor (lbs) | Earthquake Force Ver (lbs) | Surcharge Load (lbs) |
|-----------|------------|--------------|-----------------------|-----------------------|----------------------|---------------------|----------------------------|----------------------------|----------------------|
| 1         | 1.0        | 52.3         | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 2         | 9.0        | 4987.9       | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 3         | 119.0      | 155509.3     | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 4         | 155.0      | 284559.9     | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 5         | 24.6       | 56969.6      | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 6         | 3.2        | 7455.6       | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 7         | 7.1        | 9965.2       | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |
| 8         | 3.2        | 1194.9       | 0.0                   | 0.0                   | 0.                   | 0.                  | 0.0                        | 0.0                        | 0.0                  |

# Vic Trace Reservoir Static Analysis along A-A'

c:\gstabl7 data\vrstatat.pl2 Run By: PVB 9/23/2013 03:44PM



GSTABL7 v.2 FSmin=2.325

Safety Factors Are Calculated By The Simplified Janbu Method



\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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\*\*\*\*\*

## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/23/2013  
 Time of Run: 03:07PM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vtreseis.  
 Output Filename: C:\GSTABL7 DATA\vtreseis.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vtreseis.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Seismic Screening Analysis along A-A'

## BOUNDARY COORDINATES

9 Top Boundaries

11 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 352.00      | 50.00        | 355.00       | 1                   |
| 2            | 50.00       | 355.00      | 90.00        | 370.00       | 1                   |
| 3            | 90.00       | 370.00      | 235.00       | 410.00       | 2                   |
| 4            | 235.00      | 410.00      | 390.00       | 450.00       | 2                   |
| 5            | 390.00      | 450.00      | 425.00       | 464.00       | 2                   |
| 6            | 425.00      | 464.00      | 440.00       | 464.00       | 2                   |
| 7            | 440.00      | 464.00      | 460.00       | 454.00       | 2                   |
| 8            | 460.00      | 454.00      | 480.00       | 444.00       | 1                   |
| 9            | 480.00      | 444.00      | 600.00       | 444.00       | 1                   |
| 10           | 90.00       | 370.00      | 460.00       | 454.00       | 1                   |
| 11           | 0.00        | 0.00        | 0.00         | 0.00         | 0                   |

User Specified Y-Origin = 300.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Pore Pressure Param. (psf) | Pressure Constant (psf) | Piez. Surface No. |
|---------------|----------------------|--------------------------|--------------------------|----------------------|----------------------------|-------------------------|-------------------|
| 1             | 117.7                | 128.5                    | 645.0                    | 29.1                 | 0.00                       | 0.0                     | 0                 |
| 2             | 122.7                | 132.5                    | 0.0                      | 42.0                 | 0.00                       | 0.0                     | 0                 |

## ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 Is Anisotropic

Number Of Direction Ranges Specified = 3

| Direction Range No. | Counterclockwise Direction Limit (deg) | Cohesion Intercept (psf) | Friction Angle (deg) |
|---------------------|----------------------------------------|--------------------------|----------------------|
| 1                   | 10.0                                   | 645.00                   | 29.10                |
| 2                   | 14.0                                   | 30.00                    | 30.50                |
| 3                   | 90.0                                   | 645.00                   | 29.10                |

## ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.296(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

The Active And Passive Portions Of The Sliding Surfaces Are Generated According To The Rankine Theory.

500 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base  
Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

| Box No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Height (ft) |
|---------|-------------|-------------|--------------|--------------|-------------|
| 1       | 100.00      | 358.70      | 120.00       | 363.00       | 26.00       |
| 2       | 300.00      | 401.20      | 460.00       | 436.30       | 30.00       |

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Simplified Janbu Method \* \*

Total Number of Trial Surfaces Attempted = 500

Number of Trial Surfaces With Valid FS = 500

Statistical Data On All Valid FS Values:

FS Max = 1.835 FS Min = 1.084 FS Ave = 1.225

Standard Deviation = 0.218 Coefficient of Variation = 17.80 %

Failure Surface Specified By 6 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
| 1         | 110.315     | 375.604     |
| 2         | 111.791     | 374.947     |
| 3         | 117.250     | 371.738     |
| 4         | 421.045     | 441.727     |
| 5         | 423.371     | 445.684     |
| 6         | 431.526     | 464.000     |

Factor of Safety

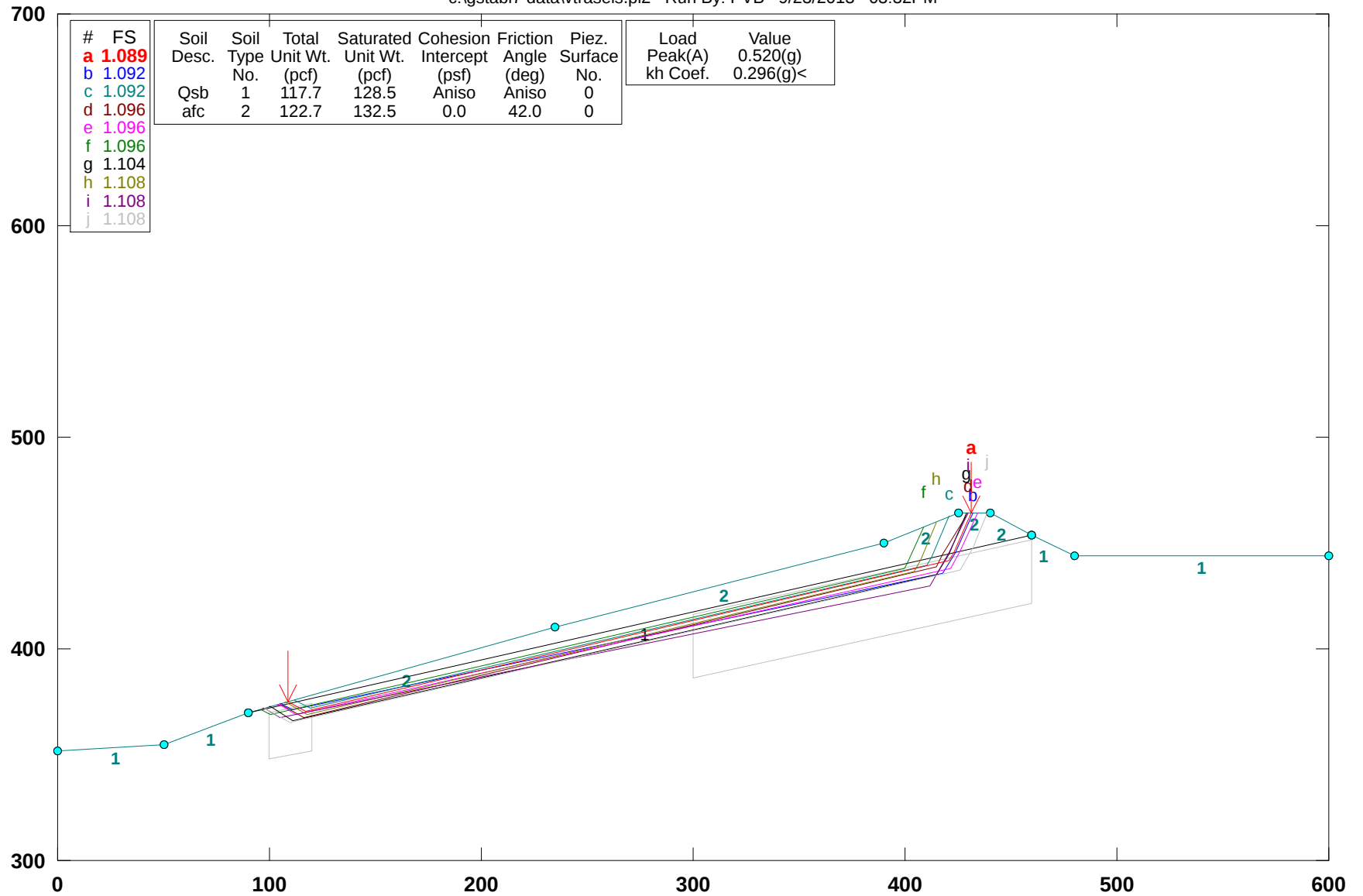
\*\*\* 1.084 \*\*\*

Individual data on the 8 slices

| Slice No. | Width (ft) | Weight (lbs) | Water Force Top (lbs) | Water Force Bot (lbs) | Tie Force Norm (lbs) | Tie Force Tan (lbs) | Earthquake Force Hor (lbs) | Earthquake Force Ver (lbs) | Surcharge Load (lbs) |
|-----------|------------|--------------|-----------------------|-----------------------|----------------------|---------------------|----------------------------|----------------------------|----------------------|
| 1         | 1.5        | 96.3         | 0.0                   | 0.0                   | 0.                   | 0.                  | 28.5                       | 0.0                        | 0.0                  |
| 2         | 5.5        | 2231.0       | 0.0                   | 0.0                   | 0.                   | 0.                  | 660.4                      | 0.0                        | 0.0                  |
| 3         | 117.8      | 119678.9     | 0.0                   | 0.0                   | 0.                   | 0.                  | 35424.9                    | 0.0                        | 0.0                  |
| 4         | 155.0      | 249621.2     | 0.0                   | 0.0                   | 0.                   | 0.                  | 73887.9                    | 0.0                        | 0.0                  |
| 5         | 31.0       | 68246.7      | 0.0                   | 0.0                   | 0.                   | 0.                  | 20201.0                    | 0.0                        | 0.0                  |
| 6         | 2.3        | 5454.2       | 0.0                   | 0.0                   | 0.                   | 0.                  | 1614.5                     | 0.0                        | 0.0                  |
| 7         | 1.6        | 3229.6       | 0.0                   | 0.0                   | 0.                   | 0.                  | 956.0                      | 0.0                        | 0.0                  |
| 8         | 6.5        | 5868.5       | 0.0                   | 0.0                   | 0.                   | 0.                  | 1737.1                     | 0.0                        | 0.0                  |

# Vic Trace Reservoir Seismic Screening Analysis along A-A'

c:\gstabl7 data\vtreseis.pl2 Run By: PVB 9/23/2013 03:32PM



GSTABL7 v.2 FSmin=1.089

Safety Factors Are Calculated By The Simplified Janbu Method



\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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\*\*\*\*\*

## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/30/2013  
 Time of Run: 11:31AM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vtrfillstat.  
 Output Filename: C:\GSTABL7 DATA\vtrfillstat.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vtrfillstat.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Static Analysis thru Fill along A-A'

## BOUNDARY COORDINATES

9 Top Boundaries

10 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 352.00      | 50.00        | 355.00       | 1                   |
| 2            | 50.00       | 355.00      | 90.00        | 370.00       | 1                   |
| 3            | 90.00       | 370.00      | 235.00       | 410.00       | 2                   |
| 4            | 235.00      | 410.00      | 390.00       | 450.00       | 2                   |
| 5            | 390.00      | 450.00      | 425.00       | 464.00       | 2                   |
| 6            | 425.00      | 464.00      | 440.00       | 464.00       | 2                   |
| 7            | 440.00      | 464.00      | 460.00       | 454.00       | 2                   |
| 8            | 460.00      | 454.00      | 480.00       | 444.00       | 1                   |
| 9            | 480.00      | 444.00      | 600.00       | 444.00       | 1                   |
| 10           | 90.00       | 370.00      | 460.00       | 454.00       | 1                   |

User Specified Y-Origin = 300.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Pore Pressure Param. (psf) | Pressure Constant (psf) | Piez. Surface No. |
|---------------|----------------------|--------------------------|--------------------------|----------------------|----------------------------|-------------------------|-------------------|
| 1             | 117.7                | 128.5                    | 170.0                    | 30.6                 | 0.00                       | 0.0                     | 0                 |
| 2             | 122.7                | 132.5                    | 0.0                      | 34.3                 | 0.00                       | 0.0                     | 0                 |

## ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 Is Anisotropic

Number Of Direction Ranges Specified = 3

| Direction Range No. | Counterclockwise Direction Limit (deg) | Cohesion Intercept (psf) | Friction Angle (deg) |
|---------------------|----------------------------------------|--------------------------|----------------------|
| 1                   | 10.0                                   | 170.00                   | 30.60                |
| 2                   | 14.0                                   | 30.00                    | 30.50                |
| 3                   | 90.0                                   | 170.00                   | 30.60                |

## ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.274(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

EARTHQUAKE DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Circular Surfaces, Has Been Specified.  
 4000 Trial Surfaces Have Been Generated.  
 1000 Surface(s) Initiate(s) From Each Of 4 Points Equally Spaced  
 Along The Ground Surface Between X = 350.00(ft)  
 and X = 390.00(ft)  
 Each Surface Terminates Between X = 425.00(ft)  
 and X = 460.00(ft)  
 Unless Further Limitations Were Imposed, The Minimum Elevation  
 At Which A Surface Extends Is Y = 420.00(ft)  
 10.00(ft) Line Segments Define Each Trial Failure Surface.  
 Following Are Displayed The Ten Most Critical Of The Trial  
 Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Simplified Janbu Method \* \*

Total Number of Trial Surfaces Attempted = 4000

Number of Trial Surfaces With Valid FS = 4000

Statistical Data On All Valid FS Values:

FS Max = 11.800 FS Min = 1.717 FS Ave = 3.829

Standard Deviation = 1.718 Coefficient of Variation = 44.88 %

Failure Surface Specified By 5 Coordinate Points

| Point<br>No. | X-Surf<br>(ft) | Y-Surf<br>(ft) |
|--------------|----------------|----------------|
| 1            | 390.000        | 450.000        |
| 2            | 399.657        | 452.598        |
| 3            | 409.077        | 455.954        |
| 4            | 418.200        | 460.048        |
| 5            | 425.410        | 464.000        |

Factor of Safety

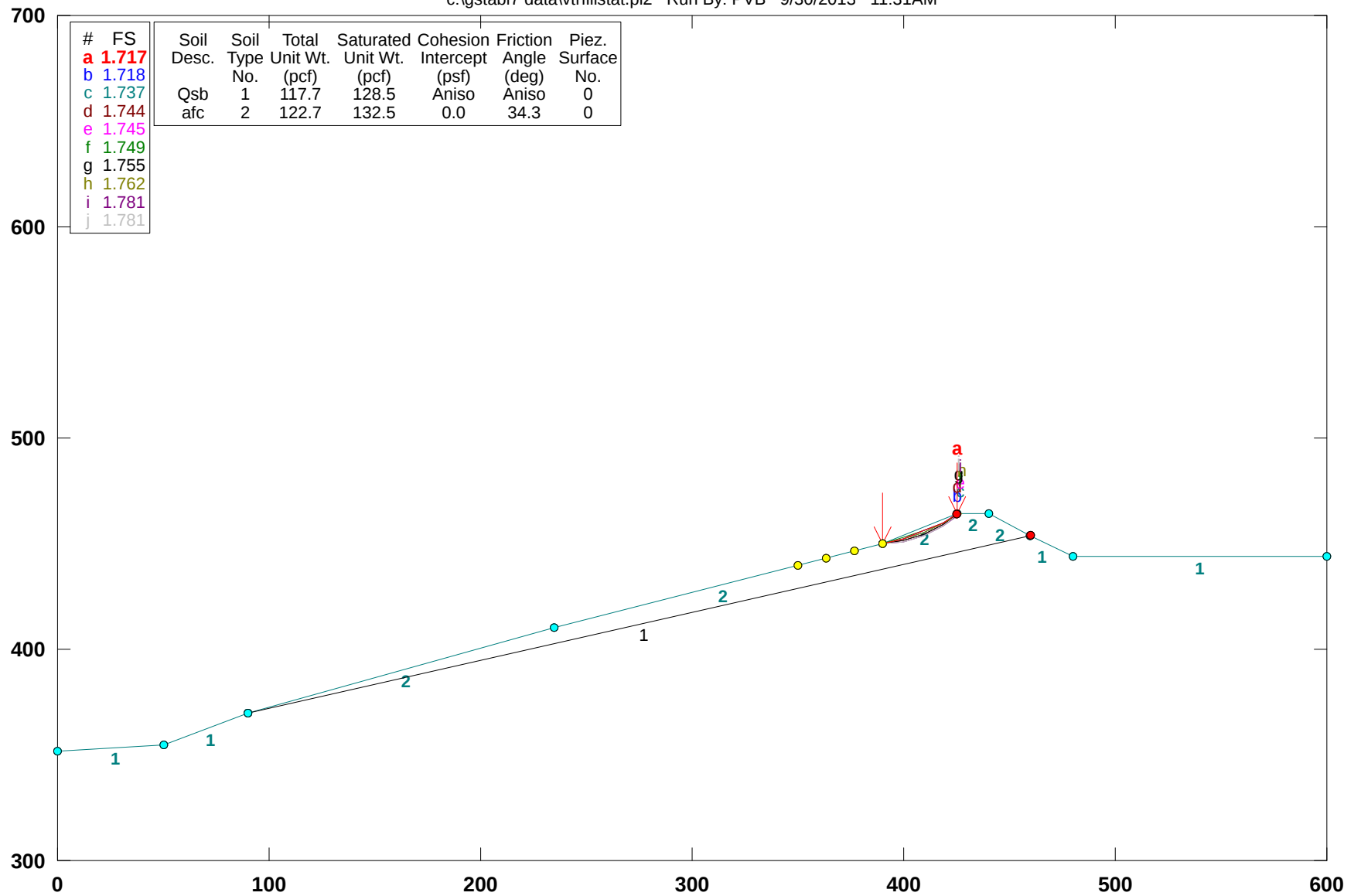
\*\*\* 1.717 \*\*\*

Individual data on the 5 slices

| Slice<br>No. | Width<br>(ft) | Weight<br>(lbs) | Water Force  |              | Tie Force     |              | Earthquake Force |              | Surcharge<br>Load<br>(lbs) |
|--------------|---------------|-----------------|--------------|--------------|---------------|--------------|------------------|--------------|----------------------------|
|              |               |                 | Top<br>(lbs) | Bot<br>(lbs) | Norm<br>(lbs) | Tan<br>(lbs) | Hor<br>(lbs)     | Ver<br>(lbs) |                            |
| 1            | 9.7           | 749.4           | 0.0          | 0.0          | 0.            | 0.           | 0.0              | 0.0          | 0.0                        |
| 2            | 9.4           | 1699.9          | 0.0          | 0.0          | 0.            | 0.           | 0.0              | 0.0          | 0.0                        |
| 3            | 9.1           | 1627.6          | 0.0          | 0.0          | 0.            | 0.           | 0.0              | 0.0          | 0.0                        |
| 4            | 6.8           | 607.5           | 0.0          | 0.0          | 0.            | 0.           | 0.0              | 0.0          | 0.0                        |
| 5            | 0.4           | 5.7             | 0.0          | 0.0          | 0.            | 0.           | 0.0              | 0.0          | 0.0                        |

# Vic Trace Reservoir Static Analysis thru Fill along A-A'

c:\gstabl7 data\vrfillstat.pl2 Run By: PVB 9/30/2013 11:31AM



GSTABL7 v.2 FSmin=1.717

Safety Factors Are Calculated By The Simplified Janbu Method



\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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\*\*\*\*\*

## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/30/2013  
 Time of Run: 11:19AM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vttrfillseis.  
 Output Filename: C:\GSTABL7 DATA\vttrfillseis.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vttrfillseis.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Seismic Screening thru Fill along A-A'

## BOUNDARY COORDINATES

9 Top Boundaries

10 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 352.00      | 50.00        | 355.00       | 1                   |
| 2            | 50.00       | 355.00      | 90.00        | 370.00       | 1                   |
| 3            | 90.00       | 370.00      | 235.00       | 410.00       | 2                   |
| 4            | 235.00      | 410.00      | 390.00       | 450.00       | 2                   |
| 5            | 390.00      | 450.00      | 425.00       | 464.00       | 2                   |
| 6            | 425.00      | 464.00      | 440.00       | 464.00       | 2                   |
| 7            | 440.00      | 464.00      | 460.00       | 454.00       | 2                   |
| 8            | 460.00      | 454.00      | 480.00       | 444.00       | 1                   |
| 9            | 480.00      | 444.00      | 600.00       | 444.00       | 1                   |
| 10           | 90.00       | 370.00      | 460.00       | 454.00       | 1                   |

User Specified Y-Origin = 300.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type No. | Total Unit Wt. (pcf) | Saturated Unit Wt. (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Pore Pressure Param. (psf) | Pressure Constant (psf) | Piez. Surface No. |
|---------------|----------------------|--------------------------|--------------------------|----------------------|----------------------------|-------------------------|-------------------|
| 1             | 117.7                | 128.5                    | 645.0                    | 29.1                 | 0.00                       | 0.0                     | 0                 |
| 2             | 122.7                | 132.5                    | 0.0                      | 42.0                 | 0.00                       | 0.0                     | 0                 |

## ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 Is Anisotropic

Number Of Direction Ranges Specified = 3

| Direction Range No. | Counterclockwise Direction Limit (deg) | Cohesion Intercept (psf) | Friction Angle (deg) |
|---------------------|----------------------------------------|--------------------------|----------------------|
| 1                   | 10.0                                   | 645.00                   | 29.10                |
| 2                   | 14.0                                   | 30.00                    | 30.50                |
| 3                   | 90.0                                   | 645.00                   | 29.10                |

## ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.296(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

4000 Trial Surfaces Have Been Generated.

1000 Surface(s) Initiate(s) From Each Of 4 Points Equally Spaced  
Along The Ground Surface Between X = 350.00(ft)

and X = 390.00(ft)  
Each Surface Terminates Between X = 425.00(ft)  
and X = 460.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation  
At Which A Surface Extends Is Y = 420.00(ft)

10.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are  
Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Simplified Janbu Method \* \*

Total Number of Trial Surfaces Attempted = 4000

Number of Trial Surfaces With Valid FS = 4000

Statistical Data On All Valid FS Values:

FS Max = 2.736 FS Min = 1.151 FS Ave = 1.824

Standard Deviation = 0.293 Coefficient of Variation = 16.06 %

Failure Surface Specified By 5 Coordinate Points

| Point<br>No. | X-Surf<br>(ft) | Y-Surf<br>(ft) |
|--------------|----------------|----------------|
| 1            | 390.000        | 450.000        |
| 2            | 399.657        | 452.598        |
| 3            | 409.077        | 455.954        |
| 4            | 418.200        | 460.048        |
| 5            | 425.410        | 464.000        |

Factor of Safety

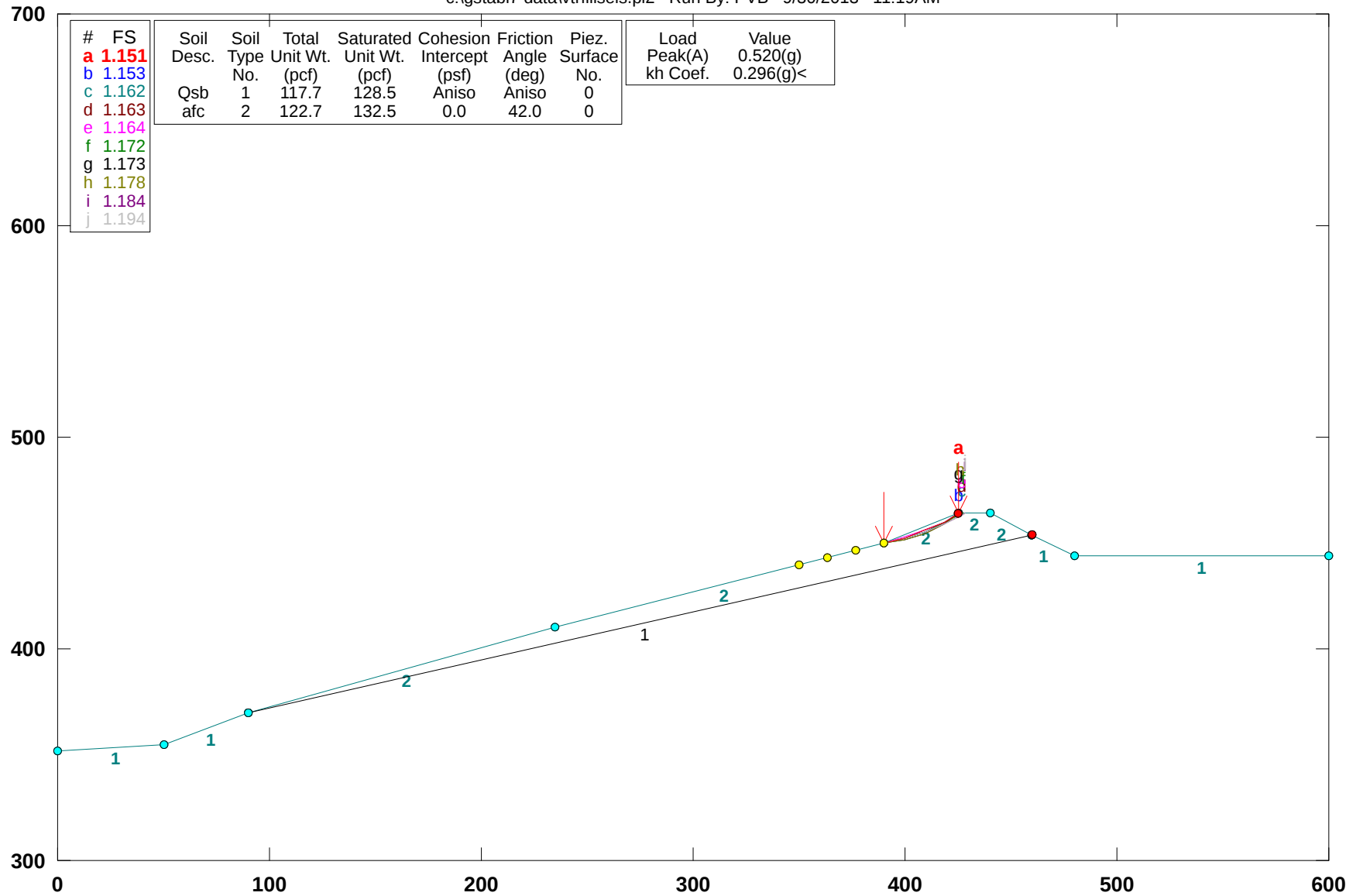
\*\*\* 1.151 \*\*\*

Individual data on the

| Slice<br>No. | Width<br>(ft) | Weight<br>(lbs) | Water                 |                       | 5 slices                      |                              | Earthquake            |                       |                            |
|--------------|---------------|-----------------|-----------------------|-----------------------|-------------------------------|------------------------------|-----------------------|-----------------------|----------------------------|
|              |               |                 | Force<br>Top<br>(lbs) | Force<br>Bot<br>(lbs) | Tie<br>Force<br>Norm<br>(lbs) | Tie<br>Force<br>Tan<br>(lbs) | Force<br>Hor<br>(lbs) | Force<br>Ver<br>(lbs) | Surcharge<br>Load<br>(lbs) |
| 1            | 9.7           | 749.4           | 0.0                   | 0.0                   | 0.                            | 0.                           | 221.8                 | 0.0                   | 0.0                        |
| 2            | 9.4           | 1699.9          | 0.0                   | 0.0                   | 0.                            | 0.                           | 503.2                 | 0.0                   | 0.0                        |
| 3            | 9.1           | 1627.6          | 0.0                   | 0.0                   | 0.                            | 0.                           | 481.8                 | 0.0                   | 0.0                        |
| 4            | 6.8           | 607.5           | 0.0                   | 0.0                   | 0.                            | 0.                           | 179.8                 | 0.0                   | 0.0                        |
| 5            | 0.4           | 5.7             | 0.0                   | 0.0                   | 0.                            | 0.                           | 1.7                   | 0.0                   | 0.0                        |

# Vic Trace Reservoir Seismic Screening thru Fill along A-A'

c:\gstabl7 data\lvtrfillseis.pl2 Run By: PVB 9/30/2013 11:19AM



GSTABL7 v.2 FSmin=1.151

Safety Factors Are Calculated By The Simplified Janbu Method



\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/24/2013  
 Time of Run: 08:00AM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vttrbseis.  
 Output Filename: C:\GSTABL7 DATA\vttrbseis.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vttrbseis.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Static Analysis along B-B'

## BOUNDARY COORDINATES

6 Top Boundaries

6 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 400.00      | 50.00        | 390.00       | 1                   |
| 2            | 50.00       | 390.00      | 190.00       | 450.00       | 1                   |
| 3            | 190.00      | 450.00      | 240.00       | 464.00       | 1                   |
| 4            | 240.00      | 464.00      | 280.00       | 464.00       | 1                   |
| 5            | 280.00      | 464.00      | 350.00       | 444.00       | 1                   |
| 6            | 350.00      | 444.00      | 450.00       | 444.00       | 1                   |

User Specified Y-Origin = 350.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

1 Type(s) of Soil

| Soil Type No. | Total (pcf) | Saturated (pcf) | Cohesion (psf) | Friction Angle (deg) | Pore Pressure Param. | Pressure Constant (psf) | Piez. Surface No. |
|---------------|-------------|-----------------|----------------|----------------------|----------------------|-------------------------|-------------------|
| 1             | 117.7       | 128.5           | 170.0          | 30.6                 | 0.00                 | 0.0                     | 0                 |

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.296(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

EARTHQUAKE DATA HAS BEEN SUPPRESSED

A Critical Failure Surface Searching Method, Using A Random Technique For Generating Circular Surfaces, Has Been Specified.

2000 Trial Surfaces Have Been Generated.

500 Surface(s) Initiate(s) From Each Of 4 Points Equally Spaced Along The Ground Surface Between X = 50.00(ft)

and X = 100.00(ft)

Each Surface Terminates Between X = 200.00(ft)

and X = 350.00(ft)

Unless Further Limitations Were Imposed, The Minimum Elevation

At Which A Surface Extends Is Y = 40.00(ft)

25.00(ft) Line Segments Define Each Trial Failure Surface.

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Modified Bishop Method \* \*

Total Number of Trial Surfaces Attempted = 2000

Number of Trial Surfaces With Valid FS = 2000

Statistical Data On All Valid FS Values:

FS Max = 6.781 FS Min = 1.843 FS Ave = 3.408

Standard Deviation = 1.057 Coefficient of Variation = 31.01 %

Failure Surface Specified By 9 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
|-----------|-------------|-------------|

|   |         |         |
|---|---------|---------|
| 1 | 50.000  | 390.000 |
| 2 | 74.905  | 392.173 |
| 3 | 99.473  | 396.800 |
| 4 | 123.463 | 403.836 |
| 5 | 146.638 | 413.212 |
| 6 | 168.772 | 424.836 |
| 7 | 189.646 | 438.593 |
| 8 | 209.056 | 454.349 |
| 9 | 210.442 | 455.724 |

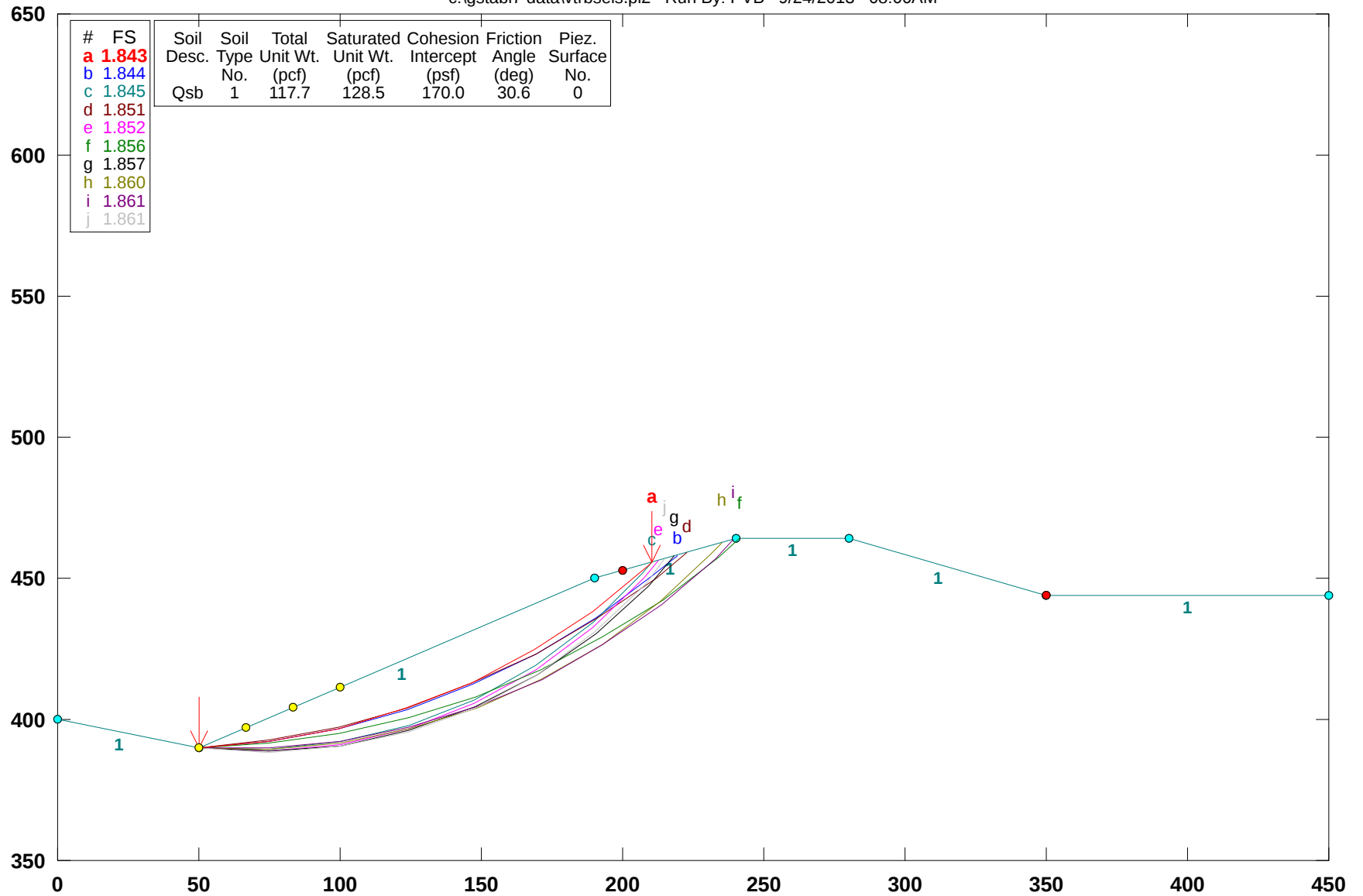
Circle Center At X = 40.555 ; Y = 642.093 ; and Radius = 252.270

Factor of Safety  
\*\*\* 1.843 \*\*\*

| Slice No. | Width (ft) | Weight (lbs) | Individual data on the |                       | 9 slices             |                     | Earthquake      |                 |                      |
|-----------|------------|--------------|------------------------|-----------------------|----------------------|---------------------|-----------------|-----------------|----------------------|
|           |            |              | Water Force Top (lbs)  | Water Force Bot (lbs) | Tie Force Norm (lbs) | Tie Force Tan (lbs) | Force Hor (lbs) | Force Ver (lbs) | Surcharge Load (lbs) |
| 1         | 24.9       | 12459.8      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 2         | 24.6       | 33115.5      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 3         | 24.0       | 45249.2      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 4         | 23.2       | 48897.9      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 5         | 22.1       | 44639.3      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 6         | 20.9       | 33562.6      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 7         | 0.4        | 466.5        | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 8         | 19.1       | 13575.4      | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |
| 9         | 1.4        | 80.5         | 0.0                    | 0.0                   | 0.                   | 0.                  | 0.0             | 0.0             | 0.0                  |

# Vic Trace Reservoir Static Analysis along B-B'

c:\gstabl7 data\vtbseis.pl2 Run By: PVB 9/24/2013 08:00AM



GSTABL7 v.2 FSmin=1.843

Safety Factors Are Calculated By The Modified Bishop Method



\*\*\* GSTABL7 \*\*\*

\*\* GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE \*\*

\*\* Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 \*\*

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\*\*\*\*\*

## SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer &amp; Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static &amp; Newmark Earthquake, and Applied Forces.

\*\*\*\*\*

Analysis Run Date: 9/23/2013  
 Time of Run: 03:07PM  
 Run By: PVB  
 Input Data Filename: C:\GSTABL7 DATA\vtreseis.  
 Output Filename: C:\GSTABL7 DATA\vtreseis.OUT  
 Unit System: English  
 Plotted Output Filename: C:\GSTABL7 DATA\vtreseis.PLT  
 PROBLEM DESCRIPTION: Vic Trace Reservoir  
 Seismic Screening Analysis along A-A'

## BOUNDARY COORDINATES

9 Top Boundaries

11 Total Boundaries

| Boundary No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Soil Type Below Bnd |
|--------------|-------------|-------------|--------------|--------------|---------------------|
| 1            | 0.00        | 352.00      | 50.00        | 355.00       | 1                   |
| 2            | 50.00       | 355.00      | 90.00        | 370.00       | 1                   |
| 3            | 90.00       | 370.00      | 235.00       | 410.00       | 2                   |
| 4            | 235.00      | 410.00      | 390.00       | 450.00       | 2                   |
| 5            | 390.00      | 450.00      | 425.00       | 464.00       | 2                   |
| 6            | 425.00      | 464.00      | 440.00       | 464.00       | 2                   |
| 7            | 440.00      | 464.00      | 460.00       | 454.00       | 2                   |
| 8            | 460.00      | 454.00      | 480.00       | 444.00       | 1                   |
| 9            | 480.00      | 444.00      | 600.00       | 444.00       | 1                   |
| 10           | 90.00       | 370.00      | 460.00       | 454.00       | 1                   |
| 11           | 0.00        | 0.00        | 0.00         | 0.00         | 0                   |

User Specified Y-Origin = 300.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

## ISOTROPIC SOIL PARAMETERS

2 Type(s) of Soil

| Soil Type No. | Total Unit (pcf) | Saturated Unit (pcf) | Cohesion Intercept (psf) | Friction Angle (deg) | Pore Pressure Param. (psf) | Pressure Constant (psf) | Piez. Surface No. |
|---------------|------------------|----------------------|--------------------------|----------------------|----------------------------|-------------------------|-------------------|
| 1             | 117.7            | 128.5                | 645.0                    | 29.1                 | 0.00                       | 0.0                     | 0                 |
| 2             | 122.7            | 132.5                | 0.0                      | 42.0                 | 0.00                       | 0.0                     | 0                 |

## ANISOTROPIC STRENGTH PARAMETERS

1 soil type(s)

Soil Type 1 Is Anisotropic

Number Of Direction Ranges Specified = 3

| Direction Range No. | Counterclockwise Direction (deg) | Cohesion Intercept (psf) | Friction Angle (deg) |
|---------------------|----------------------------------|--------------------------|----------------------|
| 1                   | 10.0                             | 645.00                   | 29.10                |
| 2                   | 14.0                             | 30.00                    | 30.50                |
| 3                   | 90.0                             | 645.00                   | 29.10                |

## ANISOTROPIC SOIL NOTES:

- (1) An input value of 0.01 for C and/or Phi will cause Aniso C and/or Phi to be ignored in that range.
- (2) An input value of 0.02 for Phi will set both Phi and C equal to zero, with no water weight in the tension crack.
- (3) An input value of 0.03 for Phi will set both Phi and C equal to zero, with water weight in the tension crack.

Specified Peak Ground Acceleration Coefficient (A) = 0.520(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.296(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Sliding Block Surfaces, Has Been Specified.

The Active And Passive Portions Of The Sliding Surfaces Are Generated According To The Rankine Theory.

500 Trial Surfaces Have Been Generated.

2 Boxes Specified For Generation Of Central Block Base  
Length Of Line Segments For Active And Passive Portions Of Sliding Block Is 25.0

| Box No. | X-Left (ft) | Y-Left (ft) | X-Right (ft) | Y-Right (ft) | Height (ft) |
|---------|-------------|-------------|--------------|--------------|-------------|
| 1       | 100.00      | 358.70      | 120.00       | 363.00       | 26.00       |
| 2       | 300.00      | 401.20      | 460.00       | 436.30       | 30.00       |

Following Are Displayed The Ten Most Critical Of The Trial

Failure Surfaces Evaluated. They Are

Ordered - Most Critical First.

\* \* Safety Factors Are Calculated By The Simplified Janbu Method \* \*

Total Number of Trial Surfaces Attempted = 500

Number of Trial Surfaces With Valid FS = 500

Statistical Data On All Valid FS Values:

FS Max = 1.835 FS Min = 1.084 FS Ave = 1.225

Standard Deviation = 0.218 Coefficient of Variation = 17.80 %

Failure Surface Specified By 6 Coordinate Points

| Point No. | X-Surf (ft) | Y-Surf (ft) |
|-----------|-------------|-------------|
| 1         | 110.315     | 375.604     |
| 2         | 111.791     | 374.947     |
| 3         | 117.250     | 371.738     |
| 4         | 421.045     | 441.727     |
| 5         | 423.371     | 445.684     |
| 6         | 431.526     | 464.000     |

Factor of Safety

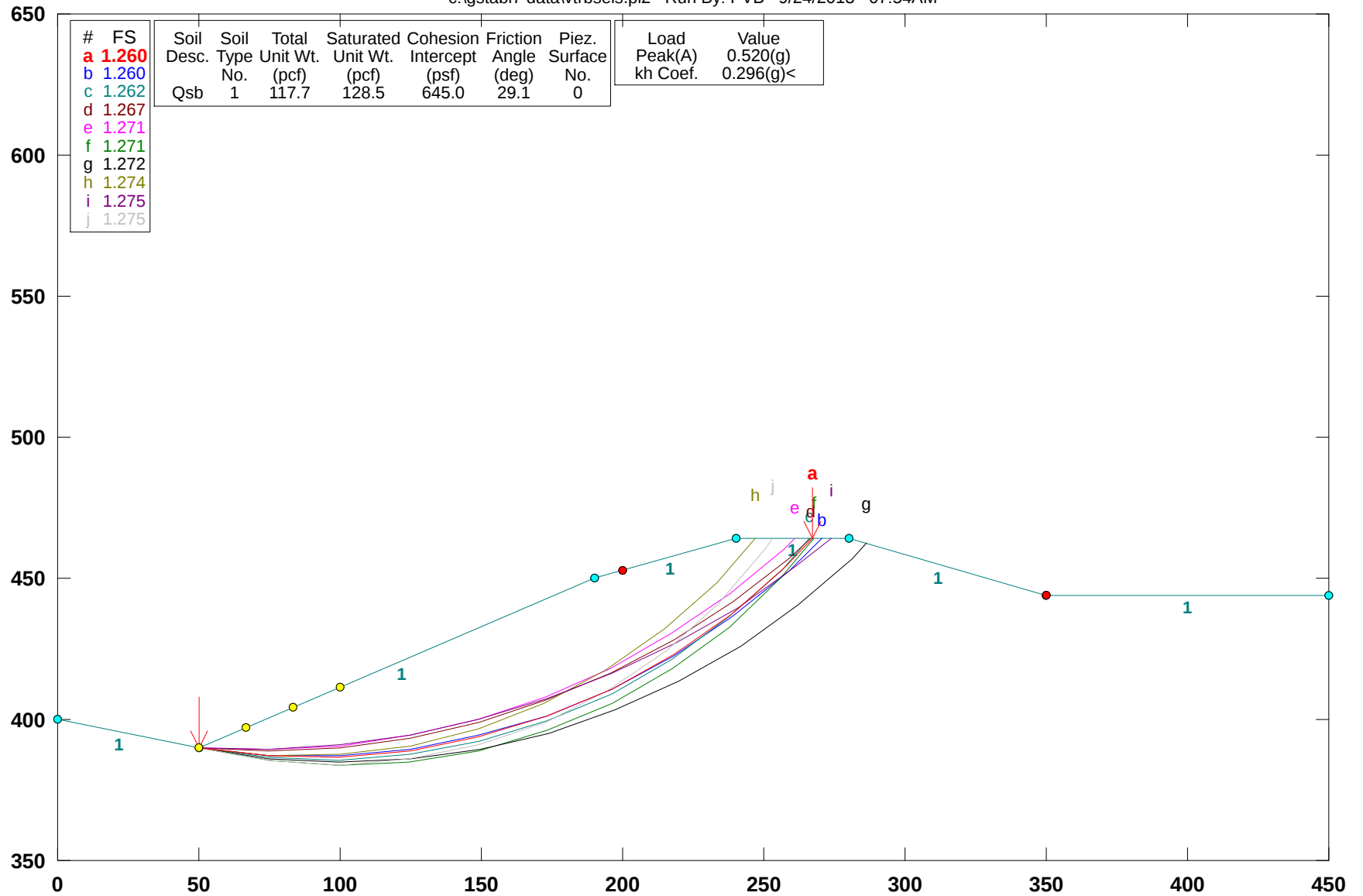
\*\*\* 1.084 \*\*\*

Individual data on the

|           |            | 8 slices     |           |           |            |           |           |            |            |           |  |
|-----------|------------|--------------|-----------|-----------|------------|-----------|-----------|------------|------------|-----------|--|
|           |            | Water        |           | Tie       |            | Tie       |           | Earthquake |            | Surcharge |  |
|           |            | Force        |           | Force     |            | Force     |           | Force      |            | Load      |  |
| Slice No. | Width (ft) | Weight (lbs) | Top (lbs) | Bot (lbs) | Norm (lbs) | Tan (lbs) | Hor (lbs) | Ver (lbs)  | Load (lbs) |           |  |
| 1         | 1.5        | 96.3         | 0.0       | 0.0       | 0.         | 0.        | 28.5      | 0.0        | 0.0        |           |  |
| 2         | 5.5        | 2231.0       | 0.0       | 0.0       | 0.         | 0.        | 660.4     | 0.0        | 0.0        |           |  |
| 3         | 117.8      | 119678.9     | 0.0       | 0.0       | 0.         | 0.        | 35424.9   | 0.0        | 0.0        |           |  |
| 4         | 155.0      | 249621.2     | 0.0       | 0.0       | 0.         | 0.        | 73887.9   | 0.0        | 0.0        |           |  |
| 5         | 31.0       | 68246.7      | 0.0       | 0.0       | 0.         | 0.        | 20201.0   | 0.0        | 0.0        |           |  |
| 6         | 2.3        | 5454.2       | 0.0       | 0.0       | 0.         | 0.        | 1614.5    | 0.0        | 0.0        |           |  |
| 7         | 1.6        | 3229.6       | 0.0       | 0.0       | 0.         | 0.        | 956.0     | 0.0        | 0.0        |           |  |
| 8         | 6.5        | 5868.5       | 0.0       | 0.0       | 0.         | 0.        | 1737.1    | 0.0        | 0.0        |           |  |

# Vic Trace Reservoir Seismic Screening Analysis along B-B'

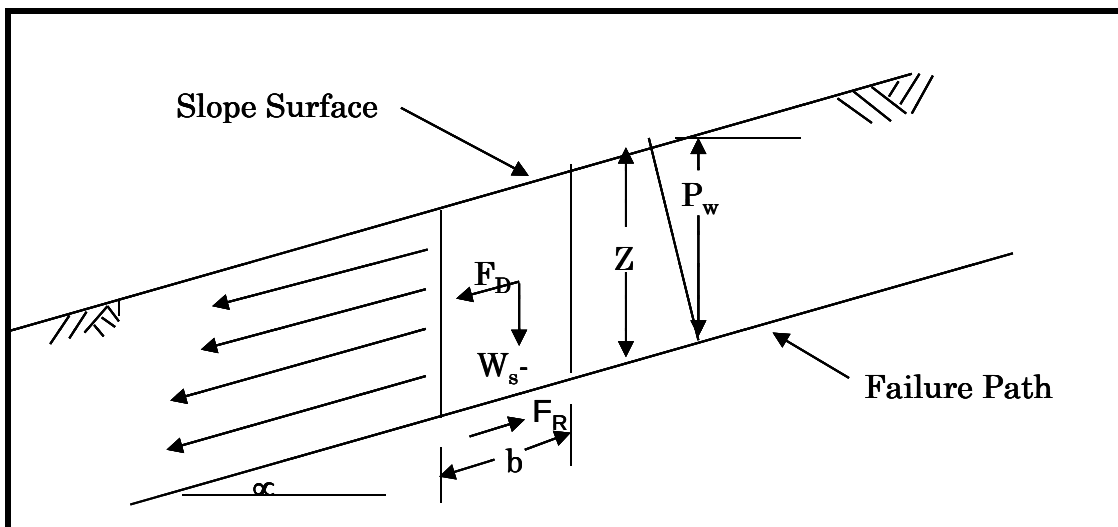
c:\gstabl7 data\trbseis.pl2 Run By: PVB 9/24/2013 07:54AM



GSTABL7 v.2 FSmin=1.260

Safety Factors Are Calculated By The Modified Bishop Method





- Assume (1) Saturation to slope surface  
(2) Sufficient permeability to establish water flow

$P_w$  = Water pressure head  
 $W_s$  = Saturated soil unit weight  
 $W_w$  = Unit weight of soil water  
 $u$  = Pore water pressure

$$P_w = Z \cos^2(\alpha)$$

$$u = W_w Z \cos^2(\alpha)$$

$$F_D = (0.5)Z(W_w)\sin(2\alpha)$$

$$F_R = Z(W_s - W_w)\cos^2(\mu)\tan\theta + c$$

$$FS = F_R/F_D = (2Z(W_s - W_w)\cos^2(\alpha)\tan\theta + 2c)/(W_s Z \sin(2\alpha))$$

|                                  |                |
|----------------------------------|----------------|
| <b>Z (feet)</b>                  | <b>= 4</b>     |
| <b><math>\alpha</math> (deg)</b> | <b>= 26.6</b>  |
| <b><math>W_s</math> (pcf)</b>    | <b>= 131.8</b> |
| <b><math>\theta</math> (deg)</b> | <b>= 31</b>    |
| <b><math>c</math> (psf)</b>      | <b>= 30</b>    |

$$FS = 0.77$$

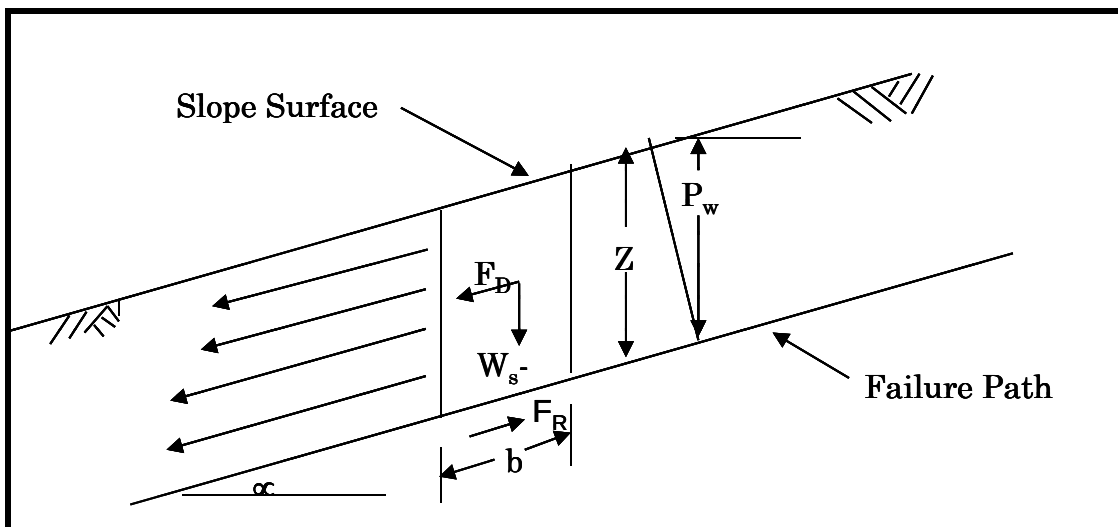
#### Problem Description

Calculations for 2:1 fill slopes using ultimate strength parameters from B-1 @ 1-5'

**Earth Systems Southern California**  
**Surficial Slope Stability Analysis**  
**Orange County Method**

Job Number: VT-24831-01

Date: Sep-13



- Assume (1) Saturation to slope surface  
(2) Sufficient permeability to establish water flow

$P_w$  = Water pressure head  
 $W_s$  = Saturated soil unit weight  
 $W_w$  = Unit weight of soil water  
 $u$  = Pore water pressure

$$P_w = Z \cos^2(\alpha)$$

$$u = W_w Z \cos^2(\alpha)$$

$$F_D = (0.5)Z(W_w)\sin(2\alpha)$$

$$F_R = Z(W_s - W_w)\cos^2(\mu)\tan\theta + c$$

$$FS = F_R/F_D = (2Z(W_s - W_w)\cos^2(\alpha)\tan\theta + 2c)/(W_s Z \sin(2\alpha))$$

|                                  |                |
|----------------------------------|----------------|
| <b>Z (feet)</b>                  | <b>= 4</b>     |
| <b><math>\alpha</math> (deg)</b> | <b>= 26.6</b>  |
| <b><math>W_s</math> (pcf)</b>    | <b>= 131.8</b> |
| <b><math>\theta</math> (deg)</b> | <b>= 32</b>    |
| <b><math>c</math> (psf)</b>      | <b>= 0</b>     |

$$FS = 0.66$$

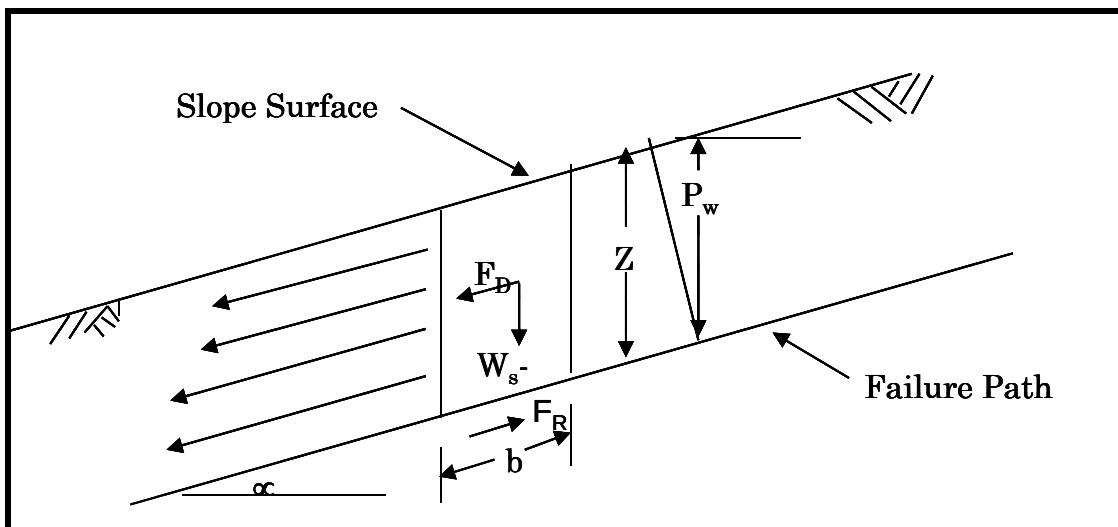
#### Problem Description

Calculations for 2:1 fill slopes using ultimate strength parameters from B-2 @ 1-5'

**Earth Systems Southern California**  
**Surficial Slope Stability Analysis**  
**Orange County Method**

Job Number: VT-24831-01

Date: Sep-13



Assume (1) Saturation to slope surface  
(2) Sufficient permeability to establish water flow

$P_w$  = Water pressure head  
 $W_s$  = Saturated soil unit weight  
 $W_w$  = Unit weight of soil water  
 $u$  = Pore water pressure

$$P_w = Z \cos^2(\alpha)$$

$$u = W_w Z \cos^2(\alpha)$$

$$F_D = (0.5)Z(W_w)\sin(2\alpha)$$

$$F_R = Z(W_s - W_w)\cos^2(\mu)\tan\theta + c$$

$$FS = F_R/F_D = (2Z(W_s - W_w)\cos^2(\alpha)\tan\theta + 2c)/(W_s Z \sin(2\alpha))$$

|                                  |                |
|----------------------------------|----------------|
| <b>Z (feet)</b>                  | <b>= 4</b>     |
| <b><math>\alpha</math> (deg)</b> | <b>= 26.6</b>  |
| <b><math>W_s</math> (pcf)</b>    | <b>= 128.7</b> |
| <b><math>\theta</math> (deg)</b> | <b>= 34</b>    |
| <b><math>c</math> (psf)</b>      | <b>= 0</b>     |

**FS = 0.69**

#### Problem Description

Calculations for 2:1 fill slopes using ultimate strength parameters from B-4 @ 1-5'

**Earth Systems Southern California**  
**Surficial Slope Stability Analysis**  
**Orange County Method**

Job Number: VT-24831-01

Date: Sep-13

# Tensor® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number      Date      10/1/13

Client      Earth Systems      Designer

Description      File

2H:1V Fill Slope Built With Soils Encountered in B-1 @ 1-5'

|                                   |                     |                 |                                |       |
|-----------------------------------|---------------------|-----------------|--------------------------------|-------|
| Static Overall FoS                | 2.00                | Input Data      | Seismic Overall FoS            | N/A   |
| FoS against Pullout               | 1.50                |                 | Seismic Acceleration Coef.     | N/A   |
| Slope Angle (deg.)                | 26.60               |                 | Vertical Saturation Depth (ft) | 4.00  |
| Soil Type                         | Sand, silt, or clay |                 |                                |       |
| Unit Weight (pcf)                 | 131.80              |                 | Friction Angle (deg.)          | 31.00 |
| Surficial Cohesion (psf)          | 30.00               |                 | Surf. Cohesion Zone Width (ft) | 1.00  |
| Deep Cohesion (psf)               | 30.00               |                 |                                |       |
|                                   |                     | Primary Geogrid | Secondary Geogrid              |       |
| Type                              |                     | None            | BX1200                         |       |
| Long Term Design Strength (lb/ft) |                     | N/A             | 505                            |       |
| Coefficient of Interaction        |                     | N/A             | 0.90                           |       |
| Partial Factor of Durability      |                     | N/A             | 1.00                           |       |
| Vertical Spacing (ft)             |                     | N/A             | 2.00                           |       |
| Percent Coverage                  |                     | N/A             |                                |       |
| Truncation Distance (ft)          |                     | N/A             |                                |       |
| Facing Option                     |                     | No Facing       |                                |       |

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# Tensar® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-1 @ 1-5'

| Potential Failure Plane Position (ft) | FoS for Soil only | FoS with Soil and One Secondary Grid | FoS with Soil and Two Secondary Grids | FoS with Soil and Three Secondary Grids | FoS with Soil and Four Secondary Grids | Secondary Grid Mobilized Strength (lb/ft) | Min. Secondary Grid Length for Potential Failure Plane (ft) |
|---------------------------------------|-------------------|--------------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|-------------------------------------------|-------------------------------------------------------------|
| 0.10                                  | 12.00             | 12.55                                | N/A                                   | N/A                                     | N/A                                    | 5.62                                      | 0.24                                                        |
| 0.50                                  | 2.92              | 3.56                                 | N/A                                   | N/A                                     | N/A                                    | 32.55                                     | 1.05                                                        |
| 1.00                                  | 1.79              | 2.54                                 | N/A                                   | N/A                                     | N/A                                    | 76.18                                     | 1.96                                                        |
| 1.50                                  | 1.41              | 2.27                                 | N/A                                   | N/A                                     | N/A                                    | 130.91                                    | 2.81                                                        |
| 2.00                                  | 1.23              | 2.20                                 | N/A                                   | N/A                                     | N/A                                    | 196.73                                    | 3.65                                                        |
| 2.50                                  | 1.12              | 2.20                                 | N/A                                   | N/A                                     | N/A                                    | 273.63                                    | 4.47                                                        |
| 3.00                                  | 1.04              | 2.23                                 | N/A                                   | N/A                                     | N/A                                    | 361.63                                    | 5.28                                                        |
| 3.50                                  | 0.99              | 2.29                                 | N/A                                   | N/A                                     | N/A                                    | 460.72                                    | 6.09                                                        |
| 4.00                                  | 0.96              | 2.20                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 6.62                                                        |
| 4.50                                  | 0.93              | 2.04                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 6.96                                                        |
| 5.00                                  | 0.91              | 1.90                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.32                                                        |
| 5.50                                  | 0.89              | 1.80                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.69                                                        |
| 6.00                                  | 0.88              | 1.71                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.04                                                        |
| 6.50                                  | 0.87              | 1.63                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.30                                                        |
| 7.00                                  | 0.86              | 1.57                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.57                                                        |
| 7.50                                  | 0.85              | 1.51                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.85                                                        |
| 8.00                                  | 1.46              | 2.09                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.14                                                        |
| 8.50                                  | 1.46              | 2.05                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.58                                                        |
| 9.00                                  | 1.46              | 2.02                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.03                                                       |
| 9.50                                  | 1.46              | 1.99                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.49                                                       |

# Tensar® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

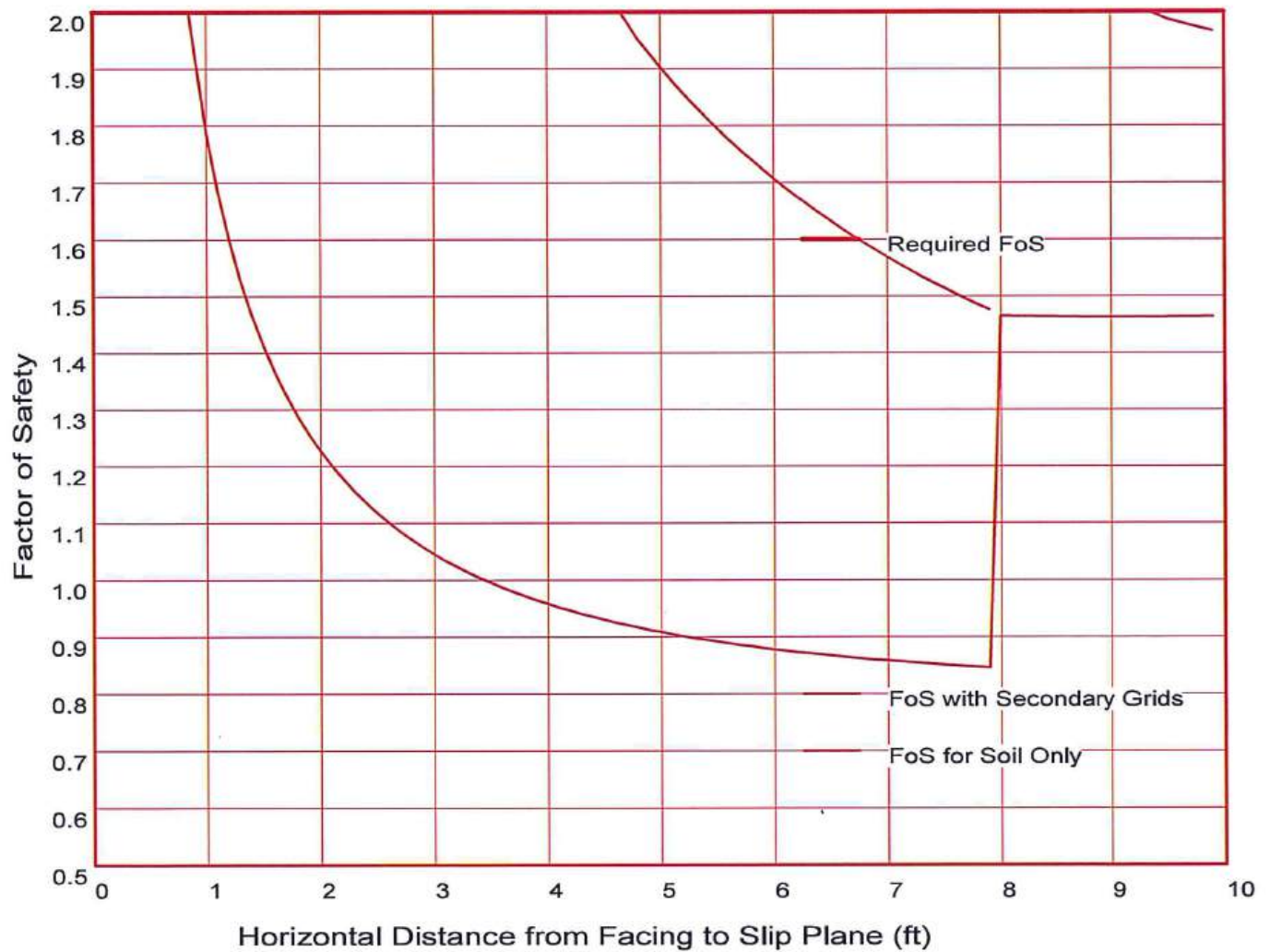
Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-1 @ 1-5'



# Tensar® Surficial Slope Stability Solution Software

Project Name Surficial Stability Analysis

Project Number

Date 10/1/13

Client Earth Systems

Designer

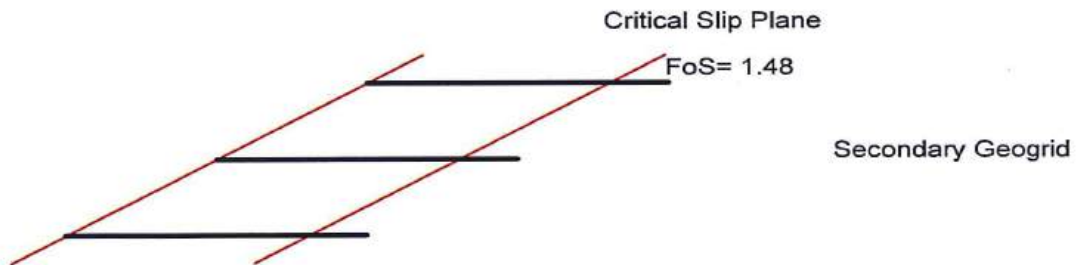
Description

File

2H:1V Fill Slope Built With Soils Encountered in B-1 @ 1-5'

## Secondary Geogrid Requirements

| Geogrid Type | Facing    | Grid No. | Spacing<br>s(in) | Min. Length<br>Ls(ft) | Total Length<br>L(ft) | Quantity<br>(sy/ft) |
|--------------|-----------|----------|------------------|-----------------------|-----------------------|---------------------|
| BX1200       | No Facing | 1        | 24.0             | 9.80                  | 9.80                  | 1.09                |



Not to scale

# Tensor® Surficial Slope Stability Solution Software

|                                                             |                              |                 |         |
|-------------------------------------------------------------|------------------------------|-----------------|---------|
| <u>Project Name</u>                                         | Surficial Stability Analysis |                 |         |
| <u>Project Number</u>                                       |                              | <u>Date</u>     | 10/1/13 |
| <u>Client</u>                                               | Earth Systems                | <u>Designer</u> |         |
| <u>Description</u>                                          |                              | <u>File</u>     |         |
| 2H:1V Fill Slope Built With Soils Encountered in B-2 @ 1-5' |                              |                 |         |

|                                   |                     |                                |                                |       |
|-----------------------------------|---------------------|--------------------------------|--------------------------------|-------|
| Static Overall FoS                | 2.00                | Input Data                     | Seismic Overall FoS            | N/A   |
| FoS against Pullout               | 1.50                |                                | Seismic Acceleration Coef.     | N/A   |
| Slope Angle (deg.)                | 26.60               |                                | Vertical Saturation Depth (ft) | 4.00  |
| Soil Type                         | Sand, silt, or clay |                                |                                |       |
| Unit Weight (pcf)                 | 131.80              | Friction Angle (deg.)          |                                | 32.00 |
| Surficial Cohesion (psf)          | 30.00               | Surf. Cohesion Zone Width (ft) |                                | 1.00  |
| Deep Cohesion (psf)               | 0.00                |                                |                                |       |
|                                   |                     | Primary Geogrid                | Secondary Geogrid              |       |
| Type                              |                     | None                           | BX1200                         |       |
| Long Term Design Strength (lb/ft) |                     | N/A                            | 505                            |       |
| Coefficient of Interaction        |                     | N/A                            | 0.90                           |       |
| Partial Factor of Durability      |                     | N/A                            | 1.00                           |       |
| Vertical Spacing (ft)             |                     | N/A                            | 1.50                           |       |
| Percent Coverage                  |                     | N/A                            |                                |       |
| Truncation Distance (ft)          |                     | N/A                            |                                |       |
| Facing Option                     |                     | No Facing                      |                                |       |

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# Tensor® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-2 @ 1-5'

| Potential Failure Plane Position (ft) | FoS for Soil only | FoS with Soil and One Secondary Grid | FoS with Soil and Two Secondary Grids | FoS with Soil and Three Secondary Grids | FoS with Soil and Four Secondary Grids | Secondary Grid Mobilized Strength (lb/ft) | Min. Secondary Grid Length for Potential Failure Plane (ft) |
|---------------------------------------|-------------------|--------------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|-------------------------------------------|-------------------------------------------------------------|
| 0.10                                  | 12.02             | 12.77                                | N/A                                   | N/A                                     | N/A                                    | 5.63                                      | 0.24                                                        |
| 0.50                                  | 2.94              | 3.81                                 | N/A                                   | N/A                                     | N/A                                    | 32.77                                     | 1.10                                                        |
| 1.00                                  | 0.66              | 1.69                                 | N/A                                   | N/A                                     | N/A                                    | 77.07                                     | 2.45                                                        |
| 1.50                                  | 0.67              | 1.60                                 | N/A                                   | N/A                                     | N/A                                    | 105.90                                    | 3.02                                                        |
| 2.00                                  | 0.67              | 1.64                                 | N/A                                   | N/A                                     | N/A                                    | 146.27                                    | 3.68                                                        |
| 2.50                                  | 0.68              | 1.73                                 | N/A                                   | N/A                                     | N/A                                    | 198.17                                    | 4.37                                                        |
| 3.00                                  | 0.68              | 1.84                                 | N/A                                   | N/A                                     | N/A                                    | 261.61                                    | 5.10                                                        |
| 3.50                                  | 0.68              | 1.96                                 | N/A                                   | N/A                                     | N/A                                    | 336.58                                    | 5.84                                                        |
| 4.00                                  | 0.69              | 2.09                                 | N/A                                   | N/A                                     | N/A                                    | 423.08                                    | 6.60                                                        |
| 4.50                                  | 0.69              | 2.18                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.29                                                        |
| 5.00                                  | 0.69              | 2.03                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.61                                                        |
| 5.50                                  | 0.70              | 1.92                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.94                                                        |
| 6.00                                  | 0.70              | 1.82                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.18                                                        |
| 6.50                                  | 0.71              | 1.74                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.42                                                        |
| 7.00                                  | 0.71              | 1.67                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.66                                                        |
| 7.50                                  | 0.71              | 1.61                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.92                                                        |
| 8.00                                  | 1.36              | 2.20                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.19                                                        |
| 8.50                                  | 1.37              | 2.16                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.63                                                        |
| 9.00                                  | 1.38              | 2.12                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.07                                                       |
| 9.50                                  | 1.38              | 2.09                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.52                                                       |

# Tensar® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

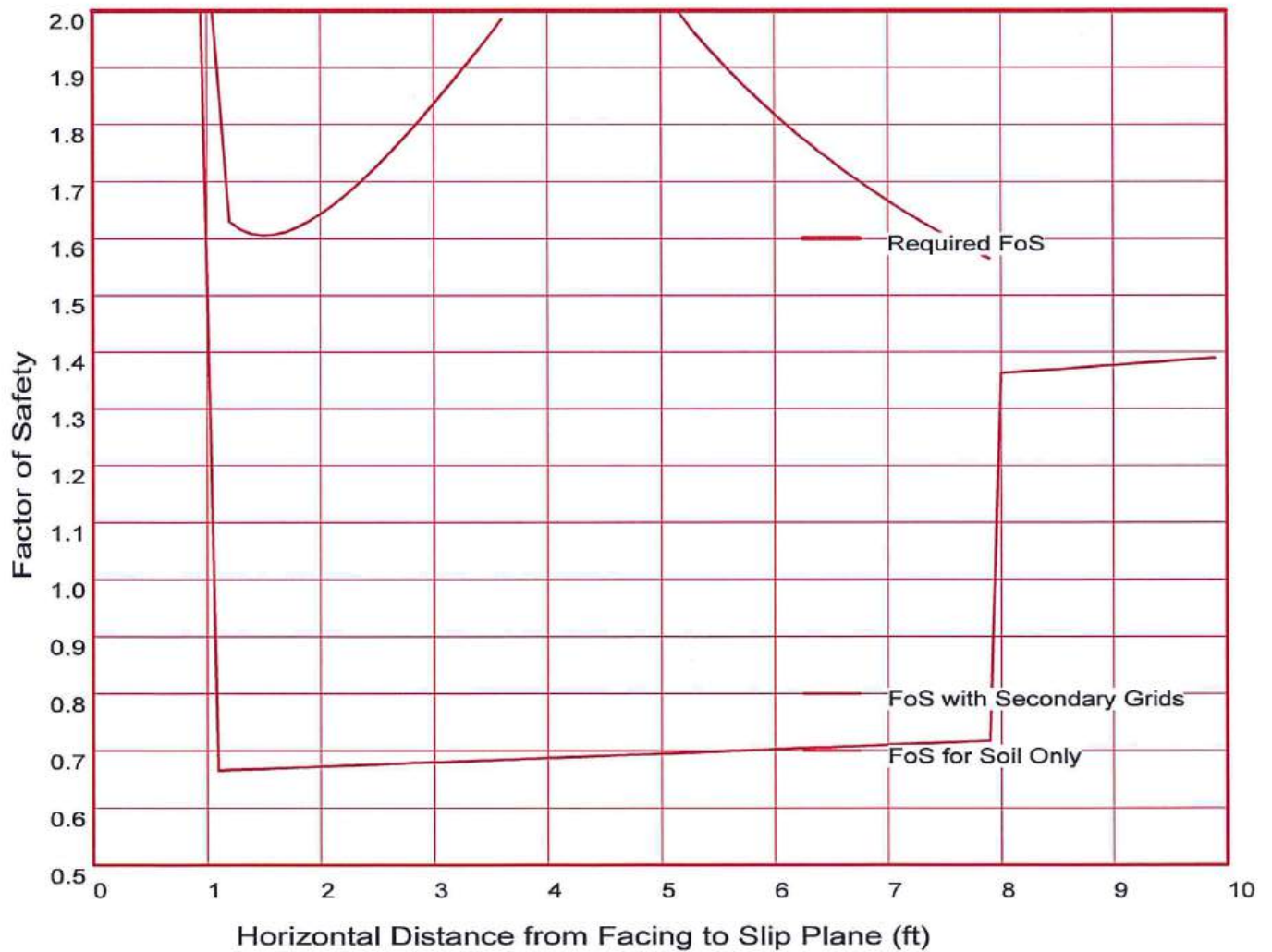
Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-2 @ 1-5'



# Tensar® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

Client      Earth Systems

Designer

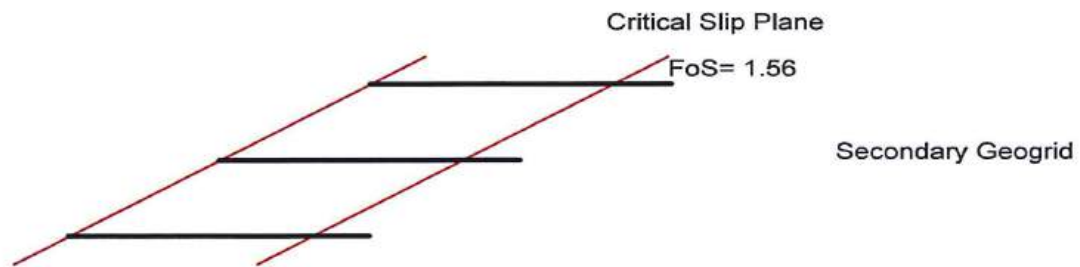
Description

File

2H:1V Fill Slope Built With Soils Encountered in B-2 @ 1-5'

## Secondary Geogrid Requirements

| Geogrid Type | Facing    | Grid No. | Spacing<br>s(in) | Min. Length<br>Ls(ft) | Total Length<br>L(ft) | Quantity<br>(sy/ft) |
|--------------|-----------|----------|------------------|-----------------------|-----------------------|---------------------|
| BX1200       | No Facing | 1        | 18.0             | 9.80                  | 9.80                  | 1.09                |



Not to scale

# Tensor® Surficial Slope Stability Solution Software

|                                                             |                              |                 |         |
|-------------------------------------------------------------|------------------------------|-----------------|---------|
| <u>Project Name</u>                                         | Surficial Stability Analysis |                 |         |
| <u>Project Number</u>                                       |                              | <u>Date</u>     | 10/1/13 |
| <u>Client</u>                                               | Earth Systems                | <u>Designer</u> |         |
| <u>Description</u>                                          |                              | <u>File</u>     |         |
| 2H:1V Fill Slope Built With Soils Encountered in B-4 @ 1-5' |                              |                 |         |

|                                   |                     |                 |                                |       |
|-----------------------------------|---------------------|-----------------|--------------------------------|-------|
| Static Overall FoS                | 2.00                | Input Data      | Seismic Overall FoS            | N/A   |
| FoS against Pullout               | 1.50                |                 | Seismic Acceleration Coef.     | N/A   |
| Slope Angle (deg.)                | 26.60               |                 | Vertical Saturation Depth (ft) | 4.00  |
| Soil Type                         | Sand, silt, or clay |                 |                                |       |
| Unit Weight (pcf)                 | 128.70              |                 | Friction Angle (deg.)          | 34.00 |
| Surficial Cohesion (psf)          | 30.00               |                 | Surf. Cohesion Zone Width (ft) | 1.00  |
| Deep Cohesion (psf)               | 0.00                |                 |                                |       |
|                                   |                     | Primary Geogrid | Secondary Geogrid              |       |
| Type                              |                     | None            | BX1200                         |       |
| Long Term Design Strength (lb/ft) |                     | N/A             | 505                            |       |
| Coefficient of Interaction        |                     | N/A             | 0.90                           |       |
| Partial Factor of Durability      |                     | N/A             | 1.00                           |       |
| Vertical Spacing (ft)             |                     | N/A             | 1.50                           |       |
| Percent Coverage                  |                     | N/A             |                                |       |
| Truncation Distance (ft)          |                     | N/A             |                                |       |
| Facing Option                     |                     | No Facing       |                                |       |

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# Tensor® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-4 @ 1-5'

| Potential Failure Plane Position (ft) | FoS for Soil only | FoS with Soil and One Secondary Grid | FoS with Soil and Two Secondary Grids | FoS with Soil and Three Secondary Grids | FoS with Soil and Four Secondary Grids | Secondary Grid Mobilized Strength (lb/ft) | Min. Secondary Grid Length for Potential Failure Plane (ft) |
|---------------------------------------|-------------------|--------------------------------------|---------------------------------------|-----------------------------------------|----------------------------------------|-------------------------------------------|-------------------------------------------------------------|
| 0.10                                  | 12.33             | 13.12                                | N/A                                   | N/A                                     | N/A                                    | 5.64                                      | 0.24                                                        |
| 0.50                                  | 3.04              | 3.95                                 | N/A                                   | N/A                                     | N/A                                    | 32.99                                     | 1.09                                                        |
| 1.00                                  | 0.70              | 1.78                                 | N/A                                   | N/A                                     | N/A                                    | 77.96                                     | 2.43                                                        |
| 1.50                                  | 0.71              | 1.70                                 | N/A                                   | N/A                                     | N/A                                    | 107.90                                    | 3.00                                                        |
| 2.00                                  | 0.71              | 1.75                                 | N/A                                   | N/A                                     | N/A                                    | 149.83                                    | 3.66                                                        |
| 2.50                                  | 0.71              | 1.84                                 | N/A                                   | N/A                                     | N/A                                    | 203.74                                    | 4.36                                                        |
| 3.00                                  | 0.72              | 1.96                                 | N/A                                   | N/A                                     | N/A                                    | 269.62                                    | 5.09                                                        |
| 3.50                                  | 0.72              | 2.10                                 | N/A                                   | N/A                                     | N/A                                    | 347.48                                    | 5.83                                                        |
| 4.00                                  | 0.73              | 2.24                                 | N/A                                   | N/A                                     | N/A                                    | 437.32                                    | 6.59                                                        |
| 4.50                                  | 0.73              | 2.28                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.20                                                        |
| 5.00                                  | 0.73              | 2.13                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.52                                                        |
| 5.50                                  | 0.74              | 2.01                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 7.87                                                        |
| 6.00                                  | 0.74              | 1.91                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.13                                                        |
| 6.50                                  | 0.75              | 1.82                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.36                                                        |
| 7.00                                  | 0.75              | 1.75                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.61                                                        |
| 7.50                                  | 0.75              | 1.69                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 8.86                                                        |
| 8.00                                  | 1.47              | 2.34                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.13                                                        |
| 8.50                                  | 1.48              | 2.30                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 9.57                                                        |
| 9.00                                  | 1.49              | 2.26                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.02                                                       |
| 9.50                                  | 1.49              | 2.23                                 | N/A                                   | N/A                                     | N/A                                    | 505.00                                    | 10.47                                                       |

# Tensar® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

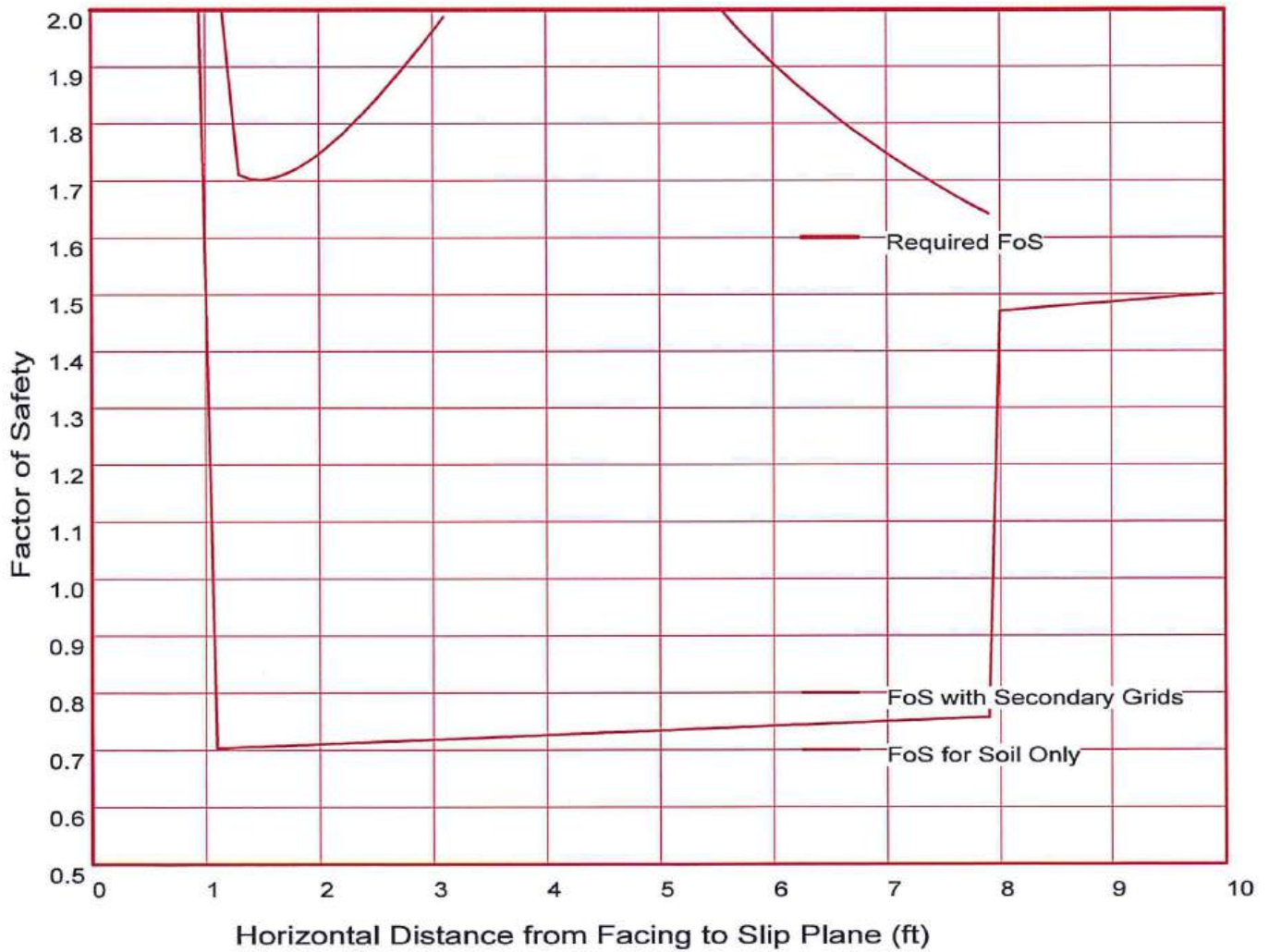
Client      Earth Systems

Designer

Description

File

2H:1V Fill Slope Built With Soils Encountered in B-4 @ 1-5'



# Tensor® Surficial Slope Stability Solution Software

Project Name      Surficial Stability Analysis

Project Number

Date      10/1/13

Client      Earth Systems

Designer

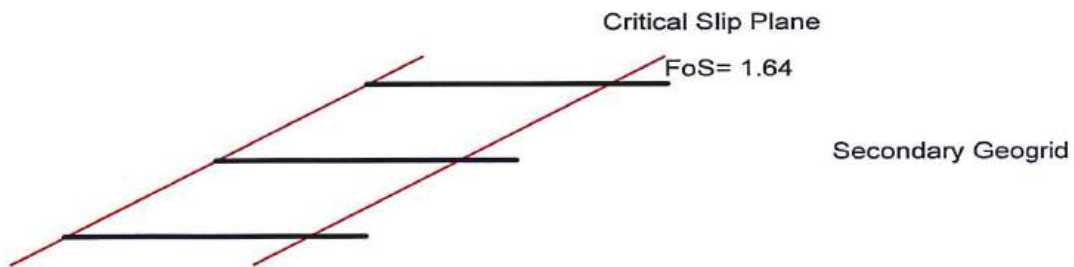
Description

File

2H:1V Fill Slope Built With Soils Encountered in B-4 @ 1-5'

## Secondary Geogrid Requirements

| Geogrid Type | Facing    | Grid No. | Spacing<br>s(in) | Min. Length<br>Ls(ft) | Total Length<br>L(ft) | Quantity<br>(sy/ft) |
|--------------|-----------|----------|------------------|-----------------------|-----------------------|---------------------|
| BX1200       | No Facing | 1        | 18.0             | 9.80                  | 9.80                  | 1.09                |



Not to scale

## Appendix B

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### **Environmental Site Investigation for the Vic Trace Reservoir Replacement Project**



**Rincon Consultants, Inc.**

319 East Carrillo Street, Suite 105  
Santa Barbara, California 93101  
805-319-4092

November 13, 2023  
Project No.: 22-12664

Thomas M. Rejzek, PG, CHG  
LUFT and Site Mitigation Unit  
Santa Barbara County Public Health Department  
Environmental Health Services Division  
2125 South Centerpointe Parkway, Suite 333  
Santa Maria, California 93455  
Via email: [TRejzek@sbcphd.org](mailto:TRejzek@sbcphd.org)

**Subject: Data Summary Submittal - Environmental Site Investigation for the Vic Trace Reservoir Replacement Project, 740 Dolores Drive, Santa Barbara, California 93109**

Dear Mr. Rejzek:

Rincon Consultants, Inc. (Rincon), on behalf of the City of Santa Barbara (City), has prepared this Data Summary Submittal for the Environmental Site Investigation for the Vic Trace Reservoir Replacement Project (project), located at 740 Dolores Drive, Santa Barbara, California (site; Figure 1). The purpose of the data summary is to report the results of the shallow soil assessment performed along the perimeter of the reservoir and associated valve building, and hazardous building materials survey conducted prior to demolition activities.

## **Background**

Rincon prepared and submitted the Environmental Site Investigation Work Plan for the Vic Trace Reservoir Replacement Project (Rincon 2023, Work Plan) to the Santa Barbara County Health Department, Environmental Health Services (EHS) on July 26, 2023. As referenced in the Work Plan, the schedule for the subsurface soil investigation associated with the presence or absence of the historic oil well drilling sump will likely be conducted following the demolition phase of the reservoir and will be dependent on access and subcontractor availability. The field work associated with the shallow soil sampling and hazardous materials building survey has been completed and is summarized below.

## **Regulatory Setting and Screening Levels**

Environmental Screening Levels (ESLs) have been established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) for chemicals commonly found in soil where releases of hazardous chemicals may have occurred (SFBRWQCB 2019). The ESLs are considered to be health-conservative concentration thresholds designed to be protective of the environment and human health. The SFBRWQCB's ESLs are used by all of the Regional Water Boards in the state of California, including the Central Coast.

Because the project will replace the existing 10-million-gallon drinking water storage tank with possibly two 5-million-gallon buried concrete tanks and site use will not change, the soil results will be compared to the Tier 1 ESL, Construction Worker ESL, and Commercial/Industrial ESL for lead. Additionally, because metals can be naturally occurring at elevated concentrations in the environment, metals are compared to regional Background Levels when Background Levels exceed risk-based



screening levels. A commonly used reference that lists estimates of naturally occurring concentrations of metals in California soil is a Kearney Foundation of Soil Science special report (Kearney 1996).

## **Shallow Soil Sampling**

On October 16, 2023, Rincon collected a total of 25 shallow soil samples from a depth of approximately 0.5 feet below ground surface (bgs) using multiple stainless-steel trowels. Each trowel was decontaminated with an Alconox solution spray and rinsed with distilled water. The small amount of decontamination water was collected in a 5-gallon bucket and had evaporated by the end of field activities. Shallow soil locations SS-1 through SS-22 were located along the perimeter of the Vic Trace Reservoir and SS-23 through SS-25 were located along the perimeter of the valve building (Figure 2).

No soil discoloration or odors were observed during field activities. The majority of the shallow soil observed at the site was clayey sand with gravel. Boring logs from this investigation are provided in Attachment 1.

The soil samples were placed directly into laboratory-supplied containers, labeled, stored in a cooler with ice, and transferred to a courier using chain-of-custody protocol for delivery to Eurofins Calscience, in Tustin, California.

## **Laboratory Analysis**

The shallow soil samples were analyzed for total lead using United States Environmental Protection Agency (USEPA) Method 6010B.

## **Results**

The laboratory analytical results are summarized in Table 1 and the laboratory analytical report is provided in Attachment 2.

Lead was detected at concentrations ranging from 5.01 to 19.4 milligrams per kilogram (mg/kg). None of the detected lead concentrations in shallow soil collected at 0.5 feet bgs surrounding the Vic Trace Reservoir or the valve building exceeded the Tier 1 ESL of 32 mg/kg, Construction Worker ESL of 160 mg/kg, or the Commercial/Industrial ESL of 320 mg/kg. Additionally, all detected lead concentrations are either below or within the Background Level concentration range of 12.4 to 97.1 mg/kg.

## **Hazardous Building Materials Survey**

FCG Environmental (FCG) was subcontracted to perform the hazardous building materials survey of the reservoir and valve building. The Asbestos and Lead Report prepared by FCG is provided in Attachment 3.

The following services were conducted to define potential asbestos and lead concerns at the site by FCG:

- A visual inspection of representative building materials was conducted to identify suspect asbestos and lead paint or other lead materials;
- The asbestos containing building materials (ACM) surveys were conducted by a California Division of Occupation Safety and Health Certified Asbestos Consultant/Site Surveillance Technician and the lead-based paint (LBP) surveys were conducted by a State of California Department of Public Health Services Certified Lead Inspector/Risk Assessor for LBP;
- A total of 23 bulk samples were collected from representative suspect ACMs for submittal to a qualified laboratory for asbestos analysis;



- Screening for lead-based paint was conducted using an X-Ray Fluorescence (XRF) paint analyzer to screen representative surfaces and materials suspected of being coated with lead-based paint. Three bulk samples were analyzed by polarized light microscopy (PLM), to determine asbestos fiber concentrations in bulk building material samples. PLM is applicable for the analysis of building survey submissions and other bulk materials; and
- Three bulk samples were collected from the corrugated metal roofing which appeared to be covered by a light powder coating or sealant. No other painted materials were found on the main reservoir.

## Laboratory Analysis

The ACM bulk samples were collected from representative suspect materials and sent to SGS Forensic Analytical for analysis by Polarized Light Microscopy (PLM) using EPA Method 600/R- 93-116, Visual Area Estimation.

The lead bulk samples were analyzed for Total Lead by SGS Forensic Analytical, a state-certified laboratory using EPA Method 3050B/7000B using flame atomic absorption and mass spectrophotometry.

## Results

### Asbestos

Based on laboratory analytical results and visual observations, asbestos was not detected above the detection limit in any of the suspect building materials sampled as part of FCG's survey. Based on these findings, no ACMs were identified at the site.

### Lead

The concrete and wood framing were unpainted, and the corrugated aluminum roofing and siding contained only minor concentrations of lead (12-30 parts per million). All lead findings were well below any regulated levels. Therefore, no LBP or lead concerns were identified as part of FCG's survey.

## Conclusions and Recommendations

The results of the shallow soil assessment performed at the site indicate no elevated concentrations of lead are present along the perimeters of the reservoir or valve building. No mitigation measures, or special handling or management for lead impacted shallow soils is required along the perimeters of the reservoir or valve building.

The results of the hazardous building materials survey conducted for the reservoir and valve building indicate that no special handling is required for future demolition of the site building materials that were tested. Materials tested as a part of this survey may be disposed of as regular construction waste.

Surveying of the valve building structure was limited to the roofing and exterior concrete. The interior of this building was not assessed due to lack of access. Additional sampling or inspection of the valve building interior may be required should this structure be demolished or renovated.

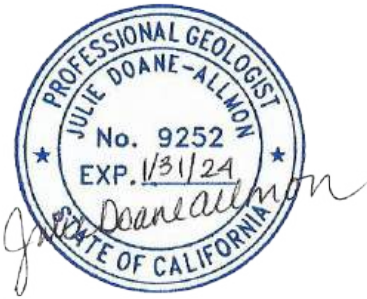
The hazardous building materials survey was limited to readily accessible areas. There is potential that suspect materials previously not included or identified by FCG's survey could be discovered during site work. This may include suspect materials located inside the parts of the reservoir underwater or not accessible during FCG's inspection. If suspect materials are found during site demolition or renovation



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work, the area should be isolated, and any suspect materials tested to confirm or deny the presence of asbestos, lead, or other hazards.

Sincerely,  
**Rincon Consultants, Inc.**



Julie Doane-Allmon, PG  
Senior Supervising Geologist

*This document has  
been digitally signed  
and sealed by  
Julie Doane-Allmon,  
PG on 11/13/23.*



Torin Snyder, PG, CHG  
Principal

*This document has  
been digitally signed  
and sealed by  
Torin Snyder, PG, CHG  
on 11/13/23.*

### **Attachments**

- Figure 1 Vicinity
- Figure 2 Shallow Soil Sampling Locations
- Table 1 Shallow Soil Analytical Results – Lead
- Attachment 1 Boring Logs
- Attachment 2 Laboratory Analytical Report
- Attachment 3 Hazardous Building Materials Survey



## References

- Kearney Foundation. 1996. *Background Concentrations of Trace and Major Elements in California Soils*. Kearney Foundation of Soil Science, Division of Agriculture and Natural Resources, University of California. March 1996.
- Rincon Consultants, Inc. (Rincon). 2023. *Environmental Site Investigation Work Plan for the Vic Trace Reservoir Replacement Project*, 740 Dolores Drive, Santa Barbara, California 93109. July 26, 2023
- San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). 2019. *Environmental Screening Levels*. July 2019, revision 2.

## Figures

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A scale bar labeled "Scale in Feet" with markings at 0, 1,000, and 2,000. To the right of the scale bar is a north arrow pointing upwards, labeled "N".

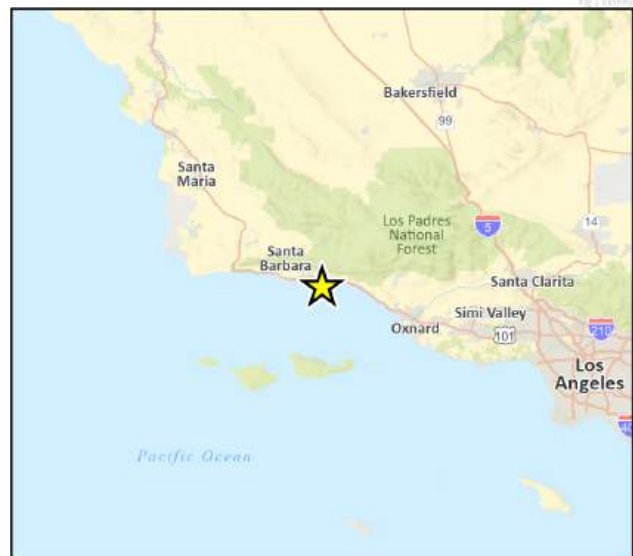
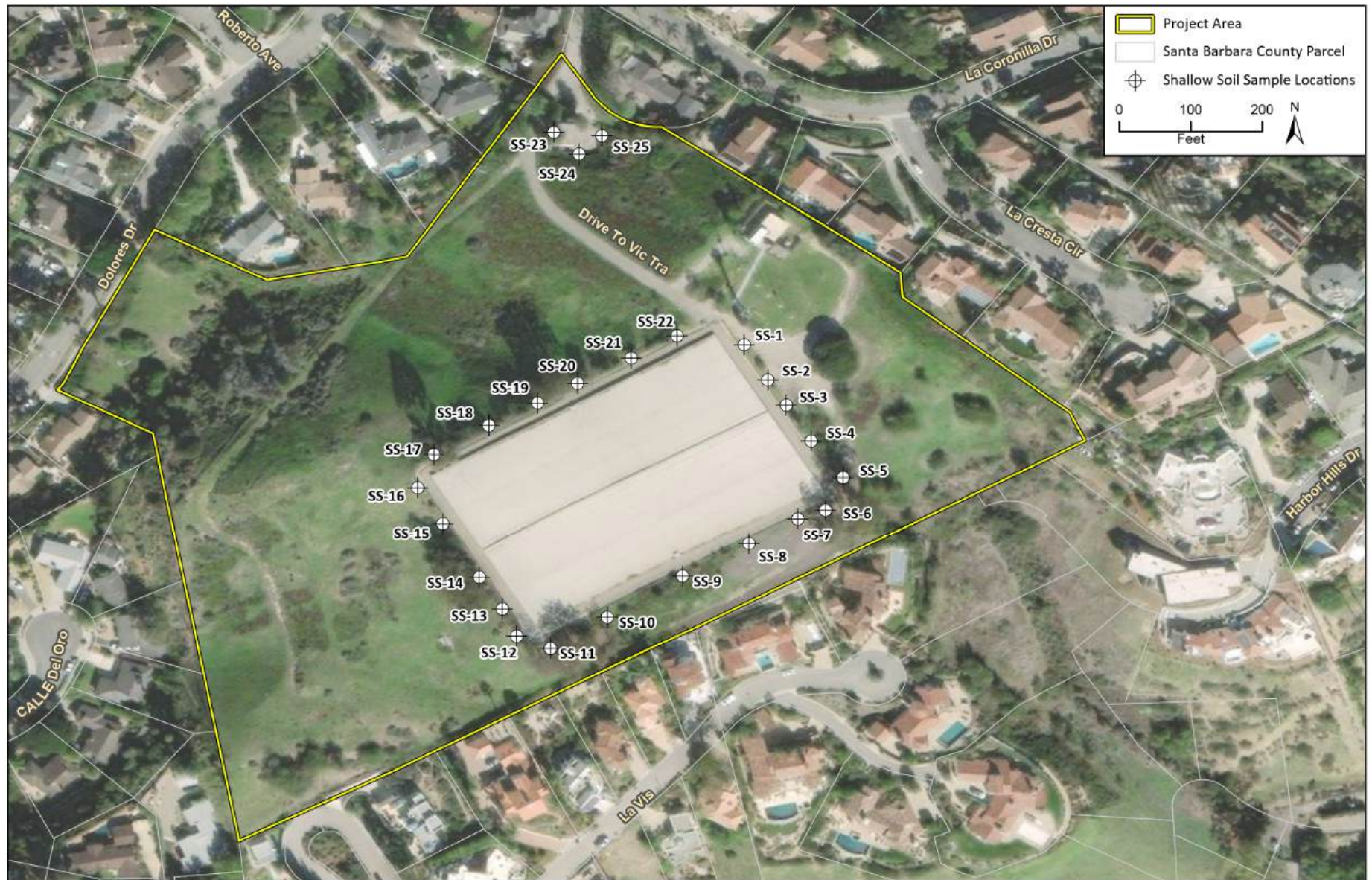


Figure 1

Vic Trace Reservoir Replacement Project  
**Limited Soil Sampling and Analysis**



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22-L2664 EES  
Fig 2 Shallow Soil Sampling Locations

Shallow Soil Sample Location

Figure 2

Rincon Consultants, Inc.

## Tables

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Table 1 Shallow Soil Analytical Results - Lead

| Sample ID                  | Sample Date | Sample Location          | Lead        |
|----------------------------|-------------|--------------------------|-------------|
|                            |             |                          | mg/kg       |
| SS-1                       | 10/16/2023  | East side of reservoir   | <b>5.01</b> |
| SS-2                       | 10/16/2023  | East side of reservoir   | <b>11.2</b> |
| SS-3                       | 10/16/2023  | East side of reservoir   | <b>16.0</b> |
| SS-4                       | 10/16/2023  | East side of reservoir   | <b>19.4</b> |
| SS-5                       | 10/16/2023  | East side of reservoir   | <b>14.8</b> |
| SS-6                       | 10/16/2023  | South side of reservoir  | <b>12.7</b> |
| SS-7                       | 10/16/2023  | South side of reservoir  | <b>14.7</b> |
| SS-8                       | 10/16/2023  | South side of reservoir  | <b>7.54</b> |
| SS-9                       | 10/16/2023  | South side of reservoir  | <b>7.63</b> |
| SS-10                      | 10/16/2023  | South side of reservoir  | <b>8.71</b> |
| SS-11                      | 10/16/2023  | South side of reservoir  | <b>9.17</b> |
| SS-12                      | 10/16/2023  | West side of reservoir   | <b>10.5</b> |
| SS-13                      | 10/16/2023  | West side of reservoir   | <b>11.8</b> |
| SS-14                      | 10/16/2023  | West side of reservoir   | <b>5.77</b> |
| SS-15                      | 10/16/2023  | West side of reservoir   | <b>6.42</b> |
| SS-16                      | 10/16/2023  | West side of reservoir   | <b>6.45</b> |
| SS-17                      | 10/16/2023  | North side of reservoir  | <b>6.26</b> |
| SS-18                      | 10/16/2023  | North side of reservoir  | <b>6.53</b> |
| SS-19                      | 10/16/2023  | North side of reservoir  | <b>8.69</b> |
| SS-20                      | 10/16/2023  | North side of reservoir  | <b>6.75</b> |
| SS-21                      | 10/16/2023  | North side of reservoir  | <b>6.21</b> |
| SS-22                      | 10/16/2023  | North side of reservoir  | <b>6.44</b> |
| SS-23                      | 10/16/2023  | West side of pump house  | <b>8.22</b> |
| SS-24                      | 10/16/2023  | South side of pump house | <b>6.65</b> |
| SS-25                      | 10/16/2023  | East side of pump house  | <b>9.95</b> |
| Tier 1 ESLs                |             |                          | 32          |
| Construction Worker ESLs   |             |                          | 160         |
| Commercial/Industrial ESLs |             |                          | 320         |
| Background Concentration   |             |                          | 12.4 - 97.1 |

#### Definitions

**bold** - Analyte detected above method detection limit

 - Concentrations detected above Tier 1 ESLs

 - Concentrations detected above Construction Worker ESLs

 - Concentrations detected above Commercial/Industrial ESLs

mg/kg - milligrams per kilogram

ID - Identification

**Analysis:** Total Lead by USEPA Method 6010B

#### Screening Levels

Background Concentration - Kearney Foundation, Background Concentrations of Trace and Major Elements in California Soils. Kearney Foundation of Soil Science, University of California, March 1996

ESLs - Environmental Screening Levels, San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), July 2019, Revision 2, Direct Exposure Human Health Risk Levels (Table S-1), Cancer Risk or Non-Cancer Hazard (lower value selected) for:

Tier 1 ESLs - ESLs for unrestricted land use at most sites

Commercial/Industrial ESLs - Commercial/Industrial: Shallow Soil Exposure

Construction Worker ESLs - Commercial/Industrial: Shallow Soil Exposure



# Attachment 1

---

Boring Logs

|  <b>RINCON CONSULTANTS, INC.</b><br>Environmental Scientists   Planners   Engineers<br>rinconconsultants.com |         |      |                                                                                                                                                             | LOG OF BORING <u>SS-1</u>                                                                                                      |  |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--|-----|
| Project and Location:<br><u>Vic Trace Reservoir</u>                                                                                                                                           |         |      | Date Completed : <u>10-16-23</u><br>Method : <u>hand</u><br>Drilled By : <u>NA</u><br>Logged By : <u>Zach Berghorst</u><br>Location : <u>East reservoir</u> |                                                                                                                                |  |     |
| Project #<br><u>22-12664</u>                                                                                                                                                                  |         |      |                                                                                                                                                             |                                                                                                                                |  |     |
| Depth<br>in<br>Feet                                                                                                                                                                           | Samples | USCS | GRAPHIC                                                                                                                                                     | DESCRIPTION                                                                                                                    |  | PID |
| 0.5                                                                                                                                                                                           |         | SC   |                                                                                                                                                             | clayey sand with gravel; sub angular grains, fine to coarse,<br>no odor or staining; dry; light brown<br>End of boring at 0.5' |  |     |

# LOG OF BORING SS-2

Project and Location:  
**Vic Trace Reservoir**

Project #  
**22-12664**

Date Completed : 10-16-23  
Method : Hand  
Drilled By : NA  
Logged By : Josh Berghorst  
Location : East Reservoir

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                                     | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | clayey sand with gravel; subangular grains; fine rootlets<br>presents fine to coarse; no odor or staining; light brown<br>End of boring at 0.5' |     |

LOG OF BORING SS-3

Project and Location:

Vic Trace Reservoir

Date Completed

10-16-23

Method

Hand

Drilled By

NA

Logged By

Zach Berghout

Location

East Reservoir

Project #

22-18664

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                          | PID |
|---------------------|---------|------|---------|--------------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | Clayey Sand with gravel; Subangular grains; fine to coarse<br>no odor or staining present; dry: light Brown<br>End of boring at 0.5' |     |

LOG OF BORING SS-4

Project and Location:

Vic Trace Reservoir

Date Completed

10-16-23

Method

Transect

Drilled By

NA

Logged By

Zach Berghorst

Location

East Reservoir

Project #

22-12064

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                            | PID |
|---------------------|---------|------|---------|----------------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | clayey Sand with gravel; subangular grains, fine to coarse,<br>no odor or staining present; dry; medium brown<br>End of boring at 0.5' |     |

LOG OF BORING SS-5

Project and Location:

Vic Trace Reservoir

Date Completed

10-16-23

Method

Hand

Drilled By

NA

Logged By

Zach Boghosian

Location

East Reservoir

Project #

22-120604Depth  
in  
Feet

Samples

USCS

GRAPHIC

DESCRIPTION

PID

0.5SC

Clayey. Sand with gravel; Subangular grains; fine to coarse; no odor or staining present; dry; light brown  
End of boring at 0.5'

LOG OF BORING SS-6

Project and Location:

Vic Trace Reservoir

Date Completed

10-16-23

Method

Trowel

Drilled By

NA

Logged By

Zach B. Johnson

Location

South Reservoir

Project #

22-12604

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                    | PID |
|---------------------|---------|------|---------|--------------------------------------------------------------------------------------------------------------------------------|-----|
| <u>0.5</u>          |         | SC   |         | Clayey Sand with gravel; Subangular grains; Fine to Coarse;<br>no odor or staining; dry; medium Brown<br>End of Boring at 0.5' |     |

LOG OF BORING SS-7

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : South of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                 | PID |
|---------------------|---------|------|---------|-----------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | Clayey Sand with gravel; Subangular grains; fine to coarse; no odor or staining; dry & light brown<br>End of boring at 0.5' |     |



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# LOG OF BORING SS-8

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : South of M.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                    | PID |
|---------------------|---------|------|---------|--------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | clayey sand with gravel; subangular grains, fine to coarse;<br>no odor or staining; dry; medium brown<br>End of boring at 0.5' |     |



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# LOG OF BORING SS-9

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : South of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                             | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | clayey sand with gravel; subangular; fine to coarse;<br>no odor or staining; dry; medium brown<br>End of boring at 0.5' |     |



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# LOG OF BORING SS-10

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : South of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                             | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | Sc   |         | clayey Sand with gravel, Subangular, Fine to coarse;<br>no odor or staining, dry, medium Brown<br>End of boring at 0.5' |     |



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# LOG OF BORING SS-11

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : South of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                | PID |
|---------------------|---------|------|---------|----------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | Clayey Sand with gravel; Subangular grains; Fine to coarse; no odor or staining; dry; light brown<br>End of boring at 0.5' |     |

|                                                                                                                                                                                               |         |      |                                                                                                                                                             |                                                                                                      |  |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--|-----|
|  <b>RINCON CONSULTANTS, INC.</b><br>Environmental Scientists   Planners   Engineers<br>rinconconsultants.com |         |      |                                                                                                                                                             | LOG OF BORING <u>SS-12</u>                                                                           |  |     |
| Project and Location:<br><b>Vic Trace Reservoir</b>                                                                                                                                           |         |      | Date Completed : <u>10-16-23</u><br>Method : <u>Trowel</u><br>Drilled By : <u>NA</u><br>Logged By : <u>Zach Berghorst</u><br>Location : <u>West of hqs.</u> |                                                                                                      |  |     |
| Project #<br><b>22-12664</b>                                                                                                                                                                  |         |      |                                                                                                                                                             |                                                                                                      |  |     |
| Depth<br>in<br>Feet                                                                                                                                                                           | Samples | USCS | GRAPHIC                                                                                                                                                     | DESCRIPTION                                                                                          |  | PID |
| 0.5                                                                                                                                                                                           | Sc      |      |                                                                                                                                                             | Poorly graded sand with clay and gravel; fine to coarse; subangular grains, no odor or staining; dry |  |     |



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# LOG OF BORING SS-13

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : West of res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                        | PID |
|---------------------|---------|------|---------|--------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         |      |         | Clayey Sand with gravel; Subangular; Fine to coarse;<br>no odor or staining; medium Brown<br>End of boring at 0.5' |     |

LOG OF BORING SS-14

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : West of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                             | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | Sc   |         | clayey sand with gravel; medium brown; subangular;<br>fine to coarse; no odor or staining; dry<br>End of Boring at 0.9' |     |

LOG OF BORING GS-15

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : West of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                  | PID |
|---------------------|---------|------|---------|--------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | Clayey Sand with gravel; medium Brown; Rootlets present; Subangular; Fine to coarse; no dot or grainings etc |     |



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# LOG OF BORING SS-16

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : West of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                             | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | SC   |         | Clayey Sand with gravel; medium Brown; Subangular,<br>fine to coarse; no odor or staining; dry<br>End of Boring at 0.5' |     |



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# LOG OF BORING SS-17

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : North of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                             | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5'                | SC      |      |         | Clayey sand with gravel; medium Brown; Subangular;<br>Fine to coarse; no odor or staining; dry<br>End of boring at 0.5' |     |



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# LOG OF BORING SS-18

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : North of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                         | PID |
|---------------------|---------|------|---------|---------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | clayey Sand with gravel; light Brown; Subangular<br>Fine to Coarse; no odor or staining; dm<br>End of boring at 0.5 |     |

LOG OF BORING SS-19

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : North of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                         | PID |
|---------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | clayey sand with gravel; light brown; rootlets present;<br>Subangular; Fine to Coarse; no odor or staining<br>End of boring at 0.5' |     |

|                                                                                                                                                                                               |         |      |                                                                                                                                                              |                                                                                                                         |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--|
|  <b>RINCON CONSULTANTS, INC.</b><br>Environmental Scientists   Planners   Engineers<br>rinconconsultants.com |         |      |                                                                                                                                                              | LOG OF BORING <u>SS-20</u>                                                                                              |  |
| Project and Location:<br><b>Vic Trace Reservoir</b>                                                                                                                                           |         |      | Date Completed : <u>10-16-23</u><br>Method : <u>Trowel</u><br>Drilled By : <u>NA</u><br>Logged By : <u>Zach Berghorst</u><br>Location : <u>North of Res.</u> |                                                                                                                         |  |
| Project #<br><b>22-12664</b>                                                                                                                                                                  |         |      |                                                                                                                                                              |                                                                                                                         |  |
| Depth<br>in<br>Feet                                                                                                                                                                           | Samples | USCS | GRAPHIC                                                                                                                                                      | DESCRIPTION                                                                                                             |  |
| 0.5                                                                                                                                                                                           |         | Sc   |                                                                                                                                                              | Clayey Sand with gravel; medium brown; Subangular;<br>Fine to coarse; no odor or staining; dry<br>End of boring at 0.5' |  |



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# LOG OF BORING SS-21

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : North of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                            | PID |
|---------------------|---------|------|---------|------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | Sc      |      |         | clayey sand with gravel; medium brown; subangular<br>fine to coarse; no odor or staining; dry<br>END of boring at 0.5' |     |



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# LOG OF BORING SS-22

Project and Location:  
**Vic Trace Reservoir**

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : North of Res.

Project #  
**22-12664**

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                           | PID |
|---------------------|---------|------|---------|-----------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 |         | Sc   |         | Clayey Sand with Gravel; light brown, Subangular;<br>Fine to coarse No odor or staining; dry<br>End of boring at 0.5' |     |



10-16-23  
Trowel  
NA  
Zach Berghorst  
West of Pump house

Project and Location:  
Vic Trace Reservoir

Project #  
22-12664

Date Completed : 10-16-23  
Method : Trowel  
Drilled By : NA  
Logged By : Zach Berghorst  
Location : West of Pun

| Depth<br>in<br>Feet | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                  | PID |
|---------------------|---------|------|---------|------------------------------------------------------------------------------------------------------------------------------|-----|
| 0.5                 | SM      |      |         | Silty sand; dark brown; subangular grains; fine to medium;<br>slight organic odor; no staining; dry<br>End of boring at 2.5' |     |



10-16-23  
Trowel  
NA  
Zach Berghorst  
South of Pump house

Project and Location:  
Vic Trace Reservoir

Project #  
22-12664

Date Completed

## Method

Drilled By

Logged By

Location

~~10-16-23~~

Trowel

NA

**Zach Berghorst**

South of Pump house

Depth  
in  
Feet

## Samples

USCS

GRAPHIC

DESCRIPTION

PID

GM

Silty sand; grayish brown; Subangular grains; fine to medium; Slight organic odor; no staining; dry  
End of boring at 0.5'

|                                                                                                                                                                                               |         |      |         |                                                                                                                                                                   |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  <b>RINCON CONSULTANTS, INC.</b><br>Environmental Scientists   Planners   Engineers<br>rinconconsultants.com |         |      |         | LOG OF BORING <u>SS-25</u>                                                                                                                                        |  |
| Project and Location:<br><b>Vic Trace Reservoir</b>                                                                                                                                           |         |      |         | Date Completed : <u>10-16-23</u><br>Method : <u>Trowel</u><br>Drilled By : <u>NA</u><br>Logged By : <u>Zach Berghorst</u><br>Location : <u>East of Pump house</u> |  |
| Project #<br><b>22-12664</b>                                                                                                                                                                  |         |      |         |                                                                                                                                                                   |  |
| Depth<br>in<br>Feet                                                                                                                                                                           | Samples | USCS | GRAPHIC | DESCRIPTION                                                                                                                                                       |  |
|                                                                                                                                                                                               |         |      |         | 0.5' SC Clayey Sand with gravel; light brown, rootlets present;<br>Subangulars Fine to coarse; no odor or staining;<br>dM<br>End of boring at 0.5'                |  |

## **Attachment 2**

---

Laboratory Analytical Report



# ANALYTICAL REPORT

## PREPARED FOR

Attn: Zach Berghorst  
Rincon Consultants  
319 E Carillow St  
Suite 105  
Santa Barbara, California 93101

Generated 10/26/2023 3:23:01 PM

## JOB DESCRIPTION

Vic Trace / 22-12664

## JOB NUMBER

570-157066-1

# Eurofins Calscience

## Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Calscience Project Manager.

## Authorization



Authorized for release by  
Tina Nguyen, Project Manager  
[Tina.Nguyen@et.eurofinsus.com](mailto:Tina.Nguyen@et.eurofinsus.com)  
(657)210-6301

Generated  
10/26/2023 3:23:01 PM

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## Definitions/Glossary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

### Glossary

| Abbreviation   | These commonly used abbreviations may or may not be present in this report.                                 |
|----------------|-------------------------------------------------------------------------------------------------------------|
| □              | Listed under the "D" column to designate that the result is reported on a dry weight basis                  |
| %R             | Percent Recovery                                                                                            |
| CFL            | Contains Free Liquid                                                                                        |
| CFU            | Colony Forming Unit                                                                                         |
| CNF            | Contains No Free Liquid                                                                                     |
| DER            | Duplicate Error Ratio (normalized absolute difference)                                                      |
| Dil Fac        | Dilution Factor                                                                                             |
| DL             | Detection Limit (DoD/DOE)                                                                                   |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC            | Decision Level Concentration (Radiochemistry)                                                               |
| EDL            | Estimated Detection Limit (Dioxin)                                                                          |
| LOD            | Limit of Detection (DoD/DOE)                                                                                |
| LOQ            | Limit of Quantitation (DoD/DOE)                                                                             |
| MCL            | EPA recommended "Maximum Contaminant Level"                                                                 |
| MDA            | Minimum Detectable Activity (Radiochemistry)                                                                |
| MDC            | Minimum Detectable Concentration (Radiochemistry)                                                           |
| MDL            | Method Detection Limit                                                                                      |
| ML             | Minimum Level (Dioxin)                                                                                      |
| MPN            | Most Probable Number                                                                                        |
| MQL            | Method Quantitation Limit                                                                                   |
| NC             | Not Calculated                                                                                              |
| ND             | Not Detected at the reporting limit (or MDL or EDL if shown)                                                |
| NEG            | Negative / Absent                                                                                           |
| POS            | Positive / Present                                                                                          |
| PQL            | Practical Quantitation Limit                                                                                |
| PRES           | Presumptive                                                                                                 |
| QC             | Quality Control                                                                                             |
| RER            | Relative Error Ratio (Radiochemistry)                                                                       |
| RL             | Reporting Limit or Requested Limit (Radiochemistry)                                                         |
| RPD            | Relative Percent Difference, a measure of the relative difference between two points                        |
| TEF            | Toxicity Equivalent Factor (Dioxin)                                                                         |
| TEQ            | Toxicity Equivalent Quotient (Dioxin)                                                                       |
| TNTC           | Too Numerous To Count                                                                                       |

# Case Narrative

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Job ID: 570-157066-1**

**Laboratory: Eurofins Calscience**

## Narrative

### Job Narrative 570-157066-1

#### Receipt

The samples were received on 10/17/2023 5:05 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

#### Metals

Method 6010B: The serial dilution performed for the following sample associated with batch 570-376952 was outside control limits for Lead: (570-157334-B-3-A SD ^25)

Method 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-375607 and analytical batch 570-376952 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Client Sample ID: SS-1

## Lab Sample ID: 570-157066-1

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 5.01   |           | 1.96 | 0.401 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-2

## Lab Sample ID: 570-157066-2

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 11.2   |           | 2.03 | 0.415 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-3

## Lab Sample ID: 570-157066-3

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 16.0   |           | 2.04 | 0.417 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-4

## Lab Sample ID: 570-157066-4

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 19.4   |           | 1.97 | 0.403 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-5

## Lab Sample ID: 570-157066-5

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 14.8   |           | 1.98 | 0.405 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-6

## Lab Sample ID: 570-157066-6

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 12.7   |           | 1.95 | 0.399 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-7

## Lab Sample ID: 570-157066-7

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 14.7   |           | 1.98 | 0.405 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-8

## Lab Sample ID: 570-157066-8

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 7.54   |           | 2.03 | 0.415 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-9

## Lab Sample ID: 570-157066-9

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 7.63   |           | 2.01 | 0.411 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-10

## Lab Sample ID: 570-157066-10

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 8.71   |           | 2.03 | 0.415 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-11

## Lab Sample ID: 570-157066-11

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 9.17   |           | 1.96 | 0.401 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-12

## Lab Sample ID: 570-157066-12

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 10.5   |           | 2.03 | 0.415 | mg/Kg | 5       |   | 6010B  | Total/NA  |

This Detection Summary does not include radiochemical test results.

Eurofins Calscience

# Detection Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Client Sample ID: SS-13

## Lab Sample ID: 570-157066-13

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 11.8   |           | 2.04 | 0.417 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-14

## Lab Sample ID: 570-157066-14

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 5.77   |           | 1.99 | 0.407 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-15

## Lab Sample ID: 570-157066-15

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.42   |           | 1.99 | 0.407 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-16

## Lab Sample ID: 570-157066-16

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.45   |           | 2.02 | 0.413 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-17

## Lab Sample ID: 570-157066-17

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.26   |           | 2.04 | 0.417 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-18

## Lab Sample ID: 570-157066-18

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.53   |           | 2.01 | 0.411 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-19

## Lab Sample ID: 570-157066-19

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 8.69   |           | 1.98 | 0.405 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-20

## Lab Sample ID: 570-157066-20

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.75   |           | 2.00 | 0.409 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-21

## Lab Sample ID: 570-157066-21

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.21   |           | 1.98 | 0.405 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-22

## Lab Sample ID: 570-157066-22

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.44   |           | 2.00 | 0.409 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-23

## Lab Sample ID: 570-157066-23

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 8.22   |           | 1.98 | 0.405 | mg/Kg | 5       |   | 6010B  | Total/NA  |

## Client Sample ID: SS-24

## Lab Sample ID: 570-157066-24

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 6.65   |           | 1.97 | 0.403 | mg/Kg | 5       |   | 6010B  | Total/NA  |

This Detection Summary does not include radiochemical test results.

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## Detection Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-25**

**Lab Sample ID: 570-157066-25**

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | Dil Fac | D | Method | Prep Type |
|---------|--------|-----------|------|-------|-------|---------|---|--------|-----------|
| Lead    | 9.95   |           | 2.00 | 0.409 | mg/Kg | 5       |   | 6010B  | Total/NA  |

This Detection Summary does not include radiochemical test results.

Eurofins Calscience

# Client Sample Results

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Method: SW846 6010B - Metals (ICP)

Client Sample ID: SS-1  
Date Collected: 10/16/23 09:10  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-1  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 5.01   |           | 1.96 | 0.401 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:15 | 5       |

Client Sample ID: SS-2  
Date Collected: 10/16/23 09:20  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-2  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 11.2   |           | 2.03 | 0.415 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:17 | 5       |

Client Sample ID: SS-3  
Date Collected: 10/16/23 09:30  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-3  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 16.0   |           | 2.04 | 0.417 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:20 | 5       |

Client Sample ID: SS-4  
Date Collected: 10/16/23 09:40  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-4  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 19.4   |           | 1.97 | 0.403 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:22 | 5       |

Client Sample ID: SS-5  
Date Collected: 10/16/23 09:50  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-5  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 14.8   |           | 1.98 | 0.405 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:29 | 5       |

Client Sample ID: SS-6  
Date Collected: 10/16/23 09:55  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-6  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 12.7   |           | 1.95 | 0.399 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:32 | 5       |

Client Sample ID: SS-7  
Date Collected: 10/16/23 10:00  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-7  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 14.7   |           | 1.98 | 0.405 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:05 | 5       |

Client Sample ID: SS-8  
Date Collected: 10/16/23 10:05  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-8  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 7.54   |           | 2.03 | 0.415 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:34 | 5       |

Client Sample ID: SS-9  
Date Collected: 10/16/23 10:10  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-9  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 7.63   |           | 2.01 | 0.411 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:36 | 5       |

Eurofins Calscience

# Client Sample Results

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Method: SW846 6010B - Metals (ICP)

Client Sample ID: SS-10  
Date Collected: 10/16/23 10:20  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-10  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 8.71   |           | 2.03 | 0.415 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:39 | 5       |

Client Sample ID: SS-11  
Date Collected: 10/16/23 10:30  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-11  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 9.17   |           | 1.96 | 0.401 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:41 | 5       |

Client Sample ID: SS-12  
Date Collected: 10/16/23 10:45  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-12  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 10.5   |           | 2.03 | 0.415 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:44 | 5       |

Client Sample ID: SS-13  
Date Collected: 10/16/23 11:00  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-13  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 11.8   |           | 2.04 | 0.417 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:46 | 5       |

Client Sample ID: SS-14  
Date Collected: 10/16/23 11:10  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-14  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 5.77   |           | 1.99 | 0.407 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:49 | 5       |

Client Sample ID: SS-15  
Date Collected: 10/16/23 11:20  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-15  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.42   |           | 1.99 | 0.407 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:51 | 5       |

Client Sample ID: SS-16  
Date Collected: 10/16/23 11:30  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-16  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.45   |           | 2.02 | 0.413 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 20:58 | 5       |

Client Sample ID: SS-17  
Date Collected: 10/16/23 11:40  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-17  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.26   |           | 2.04 | 0.417 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 21:01 | 5       |

Client Sample ID: SS-18  
Date Collected: 10/16/23 11:50  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-18  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.53   |           | 2.01 | 0.411 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 21:03 | 5       |

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# Client Sample Results

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Method: SW846 6010B - Metals (ICP)

Client Sample ID: SS-19  
Date Collected: 10/16/23 11:55  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-19  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 8.69   |           | 1.98 | 0.405 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 21:06 | 5       |

Client Sample ID: SS-20  
Date Collected: 10/16/23 12:00  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-20  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.75   |           | 2.00 | 0.409 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 21:08 | 5       |

Client Sample ID: SS-21  
Date Collected: 10/16/23 12:10  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-21  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.21   |           | 1.98 | 0.405 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:45 | 5       |

Client Sample ID: SS-22  
Date Collected: 10/16/23 12:15  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-22  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.44   |           | 2.00 | 0.409 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:47 | 5       |

Client Sample ID: SS-23  
Date Collected: 10/16/23 12:20  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-23  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 8.22   |           | 1.98 | 0.405 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:50 | 5       |

Client Sample ID: SS-24  
Date Collected: 10/16/23 12:25  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-24  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 6.65   |           | 1.97 | 0.403 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:52 | 5       |

Client Sample ID: SS-25  
Date Collected: 10/16/23 12:30  
Date Received: 10/17/23 17:05

Lab Sample ID: 570-157066-25  
Matrix: Solid

| Analyte | Result | Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|--------|-----------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | 9.95   |           | 2.00 | 0.409 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:59 | 5       |

# QC Sample Results

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Method: 6010B - Metals (ICP)

Lab Sample ID: MB 570-375607/1-A ^5

Matrix: Solid

Analysis Batch: 376952

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 375607

| Analyte | MB Result | MB Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|-----------|--------------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | ND        |              | 1.98 | 0.405 | mg/Kg |   | 10/20/23 08:51 | 10/24/23 22:04 | 5       |

Lab Sample ID: LCS 570-375607/2-A ^5

Matrix: Solid

Analysis Batch: 376952

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 375607

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit  | D | %Rec | %Rec Limits |
|---------|-------------|------------|---------------|-------|---|------|-------------|
| Lead    | 50.5        | 49.37      |               | mg/Kg |   | 98   | 80 - 120    |

Lab Sample ID: LCSD 570-375607/3-A ^5

Matrix: Solid

Analysis Batch: 376952

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 375607

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit  | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---------|-------------|-------------|----------------|-------|---|------|-------------|-----|-----------|
| Lead    | 49.5        | 45.66       |                | mg/Kg |   | 92   | 80 - 120    | 8   | 20        |

Lab Sample ID: MB 570-375635/1-A ^5

Matrix: Solid

Analysis Batch: 377322

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 375635

| Analyte | MB Result | MB Qualifier | RL   | MDL   | Unit  | D | Prepared       | Analyzed       | Dil Fac |
|---------|-----------|--------------|------|-------|-------|---|----------------|----------------|---------|
| Lead    | ND        |              | 2.00 | 0.409 | mg/Kg |   | 10/20/23 10:10 | 10/25/23 19:51 | 5       |

Lab Sample ID: LCS 570-375635/2-A ^5

Matrix: Solid

Analysis Batch: 377322

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 375635

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit  | D | %Rec | %Rec Limits |
|---------|-------------|------------|---------------|-------|---|------|-------------|
| Lead    | 50.0        | 47.81      |               | mg/Kg |   | 96   | 80 - 120    |

Lab Sample ID: LCSD 570-375635/3-A ^5

Matrix: Solid

Analysis Batch: 377322

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 375635

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit  | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---------|-------------|-------------|----------------|-------|---|------|-------------|-----|-----------|
| Lead    | 50.0        | 48.04       |                | mg/Kg |   | 96   | 80 - 120    | 0   | 20        |

Lab Sample ID: 570-157066-7 MS

Matrix: Solid

Analysis Batch: 377322

Client Sample ID: SS-7

Prep Type: Total/NA

Prep Batch: 375635

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit  | D | %Rec | %Rec Limits |
|---------|---------------|------------------|-------------|-----------|--------------|-------|---|------|-------------|
| Lead    | 14.7          |                  | 50.3        | 62.17     |              | mg/Kg |   | 94   | 75 - 125    |

Lab Sample ID: 570-157066-7 MSD

Matrix: Solid

Analysis Batch: 377322

Client Sample ID: SS-7

Prep Type: Total/NA

Prep Batch: 375635

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit  | D | %Rec | %Rec Limits | RPD | RPD Limit |
|---------|---------------|------------------|-------------|------------|---------------|-------|---|------|-------------|-----|-----------|
| Lead    | 14.7          |                  | 48.8        | 59.68      |               | mg/Kg |   | 92   | 75 - 125    | 4   | 20        |

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# QC Association Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Metals

### Prep Batch: 375607

| Lab Sample ID          | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|------------------------|------------------------|-----------|--------|--------|------------|
| 570-157066-21          | SS-21                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-22          | SS-22                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-23          | SS-23                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-24          | SS-24                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-25          | SS-25                  | Total/NA  | Solid  | 3050B  |            |
| MB 570-375607/1-A ^5   | Method Blank           | Total/NA  | Solid  | 3050B  |            |
| LCS 570-375607/2-A ^5  | Lab Control Sample     | Total/NA  | Solid  | 3050B  |            |
| LCSD 570-375607/3-A ^5 | Lab Control Sample Dup | Total/NA  | Solid  | 3050B  |            |

### Prep Batch: 375635

| Lab Sample ID          | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|------------------------|------------------------|-----------|--------|--------|------------|
| 570-157066-1           | SS-1                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-2           | SS-2                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-3           | SS-3                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-4           | SS-4                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-5           | SS-5                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-6           | SS-6                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-7           | SS-7                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-8           | SS-8                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-9           | SS-9                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-10          | SS-10                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-11          | SS-11                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-12          | SS-12                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-13          | SS-13                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-14          | SS-14                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-15          | SS-15                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-16          | SS-16                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-17          | SS-17                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-18          | SS-18                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-19          | SS-19                  | Total/NA  | Solid  | 3050B  |            |
| 570-157066-20          | SS-20                  | Total/NA  | Solid  | 3050B  |            |
| MB 570-375635/1-A ^5   | Method Blank           | Total/NA  | Solid  | 3050B  |            |
| LCS 570-375635/2-A ^5  | Lab Control Sample     | Total/NA  | Solid  | 3050B  |            |
| LCSD 570-375635/3-A ^5 | Lab Control Sample Dup | Total/NA  | Solid  | 3050B  |            |
| 570-157066-7 MS        | SS-7                   | Total/NA  | Solid  | 3050B  |            |
| 570-157066-7 MSD       | SS-7                   | Total/NA  | Solid  | 3050B  |            |

### Analysis Batch: 376952

| Lab Sample ID          | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|------------------------|------------------------|-----------|--------|--------|------------|
| 570-157066-21          | SS-21                  | Total/NA  | Solid  | 6010B  | 375607     |
| 570-157066-22          | SS-22                  | Total/NA  | Solid  | 6010B  | 375607     |
| 570-157066-23          | SS-23                  | Total/NA  | Solid  | 6010B  | 375607     |
| 570-157066-24          | SS-24                  | Total/NA  | Solid  | 6010B  | 375607     |
| 570-157066-25          | SS-25                  | Total/NA  | Solid  | 6010B  | 375607     |
| MB 570-375607/1-A ^5   | Method Blank           | Total/NA  | Solid  | 6010B  | 375607     |
| LCS 570-375607/2-A ^5  | Lab Control Sample     | Total/NA  | Solid  | 6010B  | 375607     |
| LCSD 570-375607/3-A ^5 | Lab Control Sample Dup | Total/NA  | Solid  | 6010B  | 375607     |

### Analysis Batch: 377322

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|------------------|-----------|--------|--------|------------|
| 570-157066-1  | SS-1             | Total/NA  | Solid  | 6010B  | 375635     |

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# QC Association Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

## Metals (Continued)

### Analysis Batch: 377322 (Continued)

| Lab Sample ID          | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|------------------------|------------------------|-----------|--------|--------|------------|
| 570-157066-2           | SS-2                   | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-3           | SS-3                   | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-4           | SS-4                   | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-7           | SS-7                   | Total/NA  | Solid  | 6010B  | 375635     |
| MB 570-375635/1-A ^5   | Method Blank           | Total/NA  | Solid  | 6010B  | 375635     |
| LCS 570-375635/2-A ^5  | Lab Control Sample     | Total/NA  | Solid  | 6010B  | 375635     |
| LCSD 570-375635/3-A ^5 | Lab Control Sample Dup | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-7 MS        | SS-7                   | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-7 MSD       | SS-7                   | Total/NA  | Solid  | 6010B  | 375635     |

### Analysis Batch: 377375

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------|------------------|-----------|--------|--------|------------|
| 570-157066-5  | SS-5             | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-6  | SS-6             | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-8  | SS-8             | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-9  | SS-9             | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-10 | SS-10            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-11 | SS-11            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-12 | SS-12            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-13 | SS-13            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-14 | SS-14            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-15 | SS-15            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-16 | SS-16            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-17 | SS-17            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-18 | SS-18            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-19 | SS-19            | Total/NA  | Solid  | 6010B  | 375635     |
| 570-157066-20 | SS-20            | Total/NA  | Solid  | 6010B  | 375635     |

# Lab Chronicle

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-1**

**Lab Sample ID: 570-157066-1**

**Date Collected: 10/16/23 09:10**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.04 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377322       | 10/25/23 20:15       | P1R     | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-2**

**Lab Sample ID: 570-157066-2**

**Date Collected: 10/16/23 09:20**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.97 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377322       | 10/25/23 20:17       | P1R     | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-3**

**Lab Sample ID: 570-157066-3**

**Date Collected: 10/16/23 09:30**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.96 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377322       | 10/25/23 20:20       | P1R     | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-4**

**Lab Sample ID: 570-157066-4**

**Date Collected: 10/16/23 09:40**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.03 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377322       | 10/25/23 20:22       | P1R     | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-5**

**Lab Sample ID: 570-157066-5**

**Date Collected: 10/16/23 09:50**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.02 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:29       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

# Lab Chronicle

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-6**

**Lab Sample ID: 570-157066-6**

**Date Collected: 10/16/23 09:55**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.05 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:32       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-7**

**Lab Sample ID: 570-157066-7**

**Date Collected: 10/16/23 10:00**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.02 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377322       | 10/25/23 20:05       | P1R     | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-8**

**Lab Sample ID: 570-157066-8**

**Date Collected: 10/16/23 10:05**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.97 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:34       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-9**

**Lab Sample ID: 570-157066-9**

**Date Collected: 10/16/23 10:10**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.99 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:36       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-10**

**Lab Sample ID: 570-157066-10**

**Date Collected: 10/16/23 10:20**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.97 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:39       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

# Lab Chronicle

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-11**

**Lab Sample ID: 570-157066-11**

**Date Collected: 10/16/23 10:30**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.04 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:41       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-12**

**Lab Sample ID: 570-157066-12**

**Date Collected: 10/16/23 10:45**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.97 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:44       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-13**

**Lab Sample ID: 570-157066-13**

**Date Collected: 10/16/23 11:00**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.96 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:46       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-14**

**Lab Sample ID: 570-157066-14**

**Date Collected: 10/16/23 11:10**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.01 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:49       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-15**

**Lab Sample ID: 570-157066-15**

**Date Collected: 10/16/23 11:20**

**Matrix: Solid**

**Date Received: 10/17/23 17:05**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.01 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:51       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

# Lab Chronicle

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-16**

**Date Collected: 10/16/23 11:30**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-16**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.98 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 20:58       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-17**

**Date Collected: 10/16/23 11:40**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-17**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.96 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 21:01       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-18**

**Date Collected: 10/16/23 11:50**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-18**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 1.99 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 21:03       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-19**

**Date Collected: 10/16/23 11:55**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-19**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.02 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 21:06       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-20**

**Date Collected: 10/16/23 12:00**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-20**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.00 g         | 50 mL        | 375635       | 10/20/23 10:10       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 377375       | 10/25/23 21:08       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

# Lab Chronicle

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

**Client Sample ID: SS-21**

**Date Collected: 10/16/23 12:10**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-21**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.02 g         | 50 mL        | 375607       | 10/20/23 08:51       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 376952       | 10/24/23 22:45       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-22**

**Date Collected: 10/16/23 12:15**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-22**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.00 g         | 50 mL        | 375607       | 10/20/23 08:51       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 376952       | 10/24/23 22:47       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-23**

**Date Collected: 10/16/23 12:20**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-23**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.02 g         | 50 mL        | 375607       | 10/20/23 08:51       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 376952       | 10/24/23 22:50       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-24**

**Date Collected: 10/16/23 12:25**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-24**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.03 g         | 50 mL        | 375607       | 10/20/23 08:51       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 376952       | 10/24/23 22:52       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

**Client Sample ID: SS-25**

**Date Collected: 10/16/23 12:30**

**Date Received: 10/17/23 17:05**

**Lab Sample ID: 570-157066-25**

**Matrix: Solid**

| Prep Type            | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab       |
|----------------------|------------|--------------|-----|------------|----------------|--------------|--------------|----------------------|---------|-----------|
| Total/NA             | Prep       | 3050B        |     |            | 2.00 g         | 50 mL        | 375607       | 10/20/23 08:51       | GYR8    | EET CAL 4 |
| Total/NA             | Analysis   | 6010B        |     | 5          |                |              | 376952       | 10/24/23 22:59       | K1UV    | EET CAL 4 |
| Instrument ID: ICP10 |            |              |     |            |                |              |              |                      |         |           |

## Laboratory References:

EET CAL 4 = Eurofins Calscience Tustin, 2841 Dow Avenue, Tustin, CA 92780, TEL (714)895-5494

Accreditation/Certification Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

Laboratory: Eurofins Calscience

The accreditations/certifications listed below are applicable to this report.

| Authority  | Program | Identification Number | Expiration Date |
|------------|---------|-----------------------|-----------------|
| California | State   | 3082                  | 07-31-24        |
| Oregon     | NELAP   | 4175                  | 02-02-24        |

- 1
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- 12
- 13
- 14

# Method Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

| Method | Method Description  | Protocol | Laboratory |
|--------|---------------------|----------|------------|
| 6010B  | Metals (ICP)        | SW846    | EET CAL 4  |
| 3050B  | Preparation, Metals | SW846    | EET CAL 4  |

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

EET CAL 4 = Eurofins Calscience Tustin, 2841 Dow Avenue, Tustin, CA 92780, TEL (714)895-5494

# Sample Summary

Client: Rincon Consultants  
Project/Site: Vic Trace / 22-12664

Job ID: 570-157066-1

| Lab Sample ID | Client Sample ID | Matrix | Collected      | Received       |
|---------------|------------------|--------|----------------|----------------|
| 570-157066-1  | SS-1             | Solid  | 10/16/23 09:10 | 10/17/23 17:05 |
| 570-157066-2  | SS-2             | Solid  | 10/16/23 09:20 | 10/17/23 17:05 |
| 570-157066-3  | SS-3             | Solid  | 10/16/23 09:30 | 10/17/23 17:05 |
| 570-157066-4  | SS-4             | Solid  | 10/16/23 09:40 | 10/17/23 17:05 |
| 570-157066-5  | SS-5             | Solid  | 10/16/23 09:50 | 10/17/23 17:05 |
| 570-157066-6  | SS-6             | Solid  | 10/16/23 09:55 | 10/17/23 17:05 |
| 570-157066-7  | SS-7             | Solid  | 10/16/23 10:00 | 10/17/23 17:05 |
| 570-157066-8  | SS-8             | Solid  | 10/16/23 10:05 | 10/17/23 17:05 |
| 570-157066-9  | SS-9             | Solid  | 10/16/23 10:10 | 10/17/23 17:05 |
| 570-157066-10 | SS-10            | Solid  | 10/16/23 10:20 | 10/17/23 17:05 |
| 570-157066-11 | SS-11            | Solid  | 10/16/23 10:30 | 10/17/23 17:05 |
| 570-157066-12 | SS-12            | Solid  | 10/16/23 10:45 | 10/17/23 17:05 |
| 570-157066-13 | SS-13            | Solid  | 10/16/23 11:00 | 10/17/23 17:05 |
| 570-157066-14 | SS-14            | Solid  | 10/16/23 11:10 | 10/17/23 17:05 |
| 570-157066-15 | SS-15            | Solid  | 10/16/23 11:20 | 10/17/23 17:05 |
| 570-157066-16 | SS-16            | Solid  | 10/16/23 11:30 | 10/17/23 17:05 |
| 570-157066-17 | SS-17            | Solid  | 10/16/23 11:40 | 10/17/23 17:05 |
| 570-157066-18 | SS-18            | Solid  | 10/16/23 11:50 | 10/17/23 17:05 |
| 570-157066-19 | SS-19            | Solid  | 10/16/23 11:55 | 10/17/23 17:05 |
| 570-157066-20 | SS-20            | Solid  | 10/16/23 12:00 | 10/17/23 17:05 |
| 570-157066-21 | SS-21            | Solid  | 10/16/23 12:10 | 10/17/23 17:05 |
| 570-157066-22 | SS-22            | Solid  | 10/16/23 12:15 | 10/17/23 17:05 |
| 570-157066-23 | SS-23            | Solid  | 10/16/23 12:20 | 10/17/23 17:05 |
| 570-157066-24 | SS-24            | Solid  | 10/16/23 12:25 | 10/17/23 17:05 |
| 570-157066-25 | SS-25            | Solid  | 10/16/23 12:30 | 10/17/23 17:05 |



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Loc: 570

157066

CHAIN-OF-CUSTODY RECORD

DATE: 10-16-23

PAGE: 1 OF 3

|                                                                                                                                                                                                                                                                                       |           |                                        |      |            |              |                                                 |           |                                     |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------|------|------------|--------------|-------------------------------------------------|-----------|-------------------------------------|------------|
| LABORATORY CLIENT: Rincon Consultants                                                                                                                                                                                                                                                 |           |                                        |      |            |              | CLIENT PROJECT NAME / NO.: Vic-Trace / 22-12664 |           | P.O. NO.:                           |            |
| ADDRESS: 319 E Carrillo St, Suite 105                                                                                                                                                                                                                                                 |           |                                        |      |            |              | PROJECT CONTACT: Julie Dome-Alman               |           | LAB CONTACT OR QUOTE NO.: 5701735-0 |            |
| CITY: Santa Barbara                                                                                                                                                                                                                                                                   |           | STATE: CA                              |      | ZIP: 93101 |              | GLOBAL ID: T10000021396                         |           | LOG CODE:                           |            |
| TEL: 805-277-9473                                                                                                                                                                                                                                                                     |           | E-MAIL: JDAllman@RinconConsultants.com |      |            |              | SAMPLER(S): (PRINT) Zach Berghorst              |           |                                     |            |
| TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):<br><input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> STANDARD |           |                                        |      |            |              | REQUESTED ANALYSES                              |           |                                     |            |
| EDD: <input type="checkbox"/> COELT EDF <input type="checkbox"/> OTHER                                                                                                                                                                                                                |           |                                        |      |            |              | Please check box or fill in blank as needed.    |           |                                     |            |
| SPECIAL INSTRUCTIONS:<br>- Please provide EDF<br>- Sample results in mg/kg<br>- Notify Julie DA ASAP of any total lead exceedances that may trigger additional analysis                                                                                                               |           |                                        |      |            |              |                                                 |           |                                     |            |
| LAB USE ONLY                                                                                                                                                                                                                                                                          | SAMPLE ID | SAMPLING                               |      | MATRIX     | NO. OF CONT. | Unpreserved                                     | Preserved | Field Filtered                      | Total Lead |
|                                                                                                                                                                                                                                                                                       |           | DATE                                   | TIME |            |              |                                                 |           |                                     |            |
| 1                                                                                                                                                                                                                                                                                     | SS-1      | 10-16-23                               | 0910 | Soil       | 1            | X                                               |           | X                                   |            |
| 2                                                                                                                                                                                                                                                                                     | SS-2      |                                        | 0920 |            |              |                                                 |           |                                     |            |
| 3                                                                                                                                                                                                                                                                                     | SS-3      |                                        | 0930 |            |              |                                                 |           |                                     |            |
| 4                                                                                                                                                                                                                                                                                     | SS-4      |                                        | 0940 |            |              |                                                 |           |                                     |            |
| 5                                                                                                                                                                                                                                                                                     | SS-5      |                                        | 0950 |            |              |                                                 |           |                                     |            |
| 6                                                                                                                                                                                                                                                                                     | SS-6      |                                        | 0955 |            |              |                                                 |           |                                     |            |
| 7                                                                                                                                                                                                                                                                                     | SS-7      |                                        | 1000 |            |              |                                                 |           |                                     |            |
| 8                                                                                                                                                                                                                                                                                     | SS-8      |                                        | 1005 |            |              |                                                 |           |                                     |            |
| 9                                                                                                                                                                                                                                                                                     | SS-9      |                                        | 1010 |            |              |                                                 |           |                                     |            |
| 10                                                                                                                                                                                                                                                                                    | SS-10     |                                        | 1020 |            |              |                                                 |           |                                     |            |
| Relinquished by: (Signature) [Signature]                                                                                                                                                                                                                                              |           |                                        |      |            |              | Date: 10-17-23                                  |           | Time: 1305                          |            |
| Relinquished by: (Signature) [Signature]                                                                                                                                                                                                                                              |           |                                        |      |            |              | Date:                                           |           | Time:                               |            |
| Relinquished by: (Signature) [Signature]                                                                                                                                                                                                                                              |           |                                        |      |            |              | Date:                                           |           | Time:                               |            |
| Received by: (Signature/Affiliation) [Signature]                                                                                                                                                                                                                                      |           |                                        |      |            |              | Date:                                           |           | Time:                               |            |
| Received by: (Signature/Affiliation) [Signature]                                                                                                                                                                                                                                      |           |                                        |      |            |              | Date: 10/17/23                                  |           | Time: 17:05                         |            |
| Received by: (Signature/Affiliation) [Signature]                                                                                                                                                                                                                                      |           |                                        |      |            |              | Date:                                           |           | Time:                               |            |



570-157066 Chain of Custody



DATE: 10-16-23  
PAGE: 2 OF 3

10/26/2023



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# CHAIN-OF-CUSTODY RECORD

DATE: 10-16-23  
PAGE: 3 OF 3

|                                                                                                                                                                                                                                                                                       |           |                                            |      |               |              |                                                    |            |                                        |                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------|------|---------------|--------------|----------------------------------------------------|------------|----------------------------------------|-------------------|
| LABORATORY CLIENT:<br>Rincon Consultants                                                                                                                                                                                                                                              |           |                                            |      |               |              | CLIENT PROJECT NAME / NO.:<br>Vic-Trace / 22-12664 |            | P.O. NO.:                              |                   |
| ADDRESS:<br>319 E Carrillo St, Suite 105                                                                                                                                                                                                                                              |           |                                            |      |               |              | PROJECT CONTACT:<br>Julie Daane - Allman           |            | LAB CONTACT OR QUOTE NO.:<br>5701735-0 |                   |
| CITY:<br>Santa Barbara                                                                                                                                                                                                                                                                |           | STATE:<br>CA                               |      | ZIP:<br>93101 |              | GLOBAL ID:<br>T10000021396                         |            | LOG CODE:                              |                   |
| TEL:<br>805-277-9473                                                                                                                                                                                                                                                                  |           | E-MAIL:<br>JDAAllman@RinconConsultants.com |      |               |              | SAMPLER(S): (PRINT)<br>Zach Berghorst              |            |                                        |                   |
| TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):<br><input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> STANDARD |           |                                            |      |               |              | REQUESTED ANALYSES                                 |            |                                        |                   |
| EDD:<br><input type="checkbox"/> COELT EDF <input type="checkbox"/> OTHER                                                                                                                                                                                                             |           |                                            |      |               |              | Please check box or fill in blank as needed.       |            |                                        |                   |
| SPECIAL INSTRUCTIONS:<br>- Please provide EDF<br>- Sample Results in mg/kg<br>- Notify Julie DA ASAP of any total lead exceedances that may trigger additional analysis                                                                                                               |           |                                            |      |               |              |                                                    |            |                                        |                   |
| LAB USE ONLY                                                                                                                                                                                                                                                                          | SAMPLE ID | SAMPLING                                   |      | MATRIX        | NO. OF CONT. | Unpreserved                                        | Preserved  | Field Filtered                         | Total Lead ColloB |
|                                                                                                                                                                                                                                                                                       |           | DATE                                       | TIME |               |              |                                                    |            |                                        |                   |
| 20                                                                                                                                                                                                                                                                                    | SS-20     | 10-16-23                                   | 1200 | Soil          | 1            | X                                                  |            |                                        | X                 |
| 21                                                                                                                                                                                                                                                                                    | SS-21     |                                            | 1210 |               |              |                                                    |            |                                        |                   |
| 22                                                                                                                                                                                                                                                                                    | SS-22     |                                            | 1215 |               |              |                                                    |            |                                        |                   |
| 23                                                                                                                                                                                                                                                                                    | SS-23     |                                            | 1220 |               |              |                                                    |            |                                        |                   |
| 24                                                                                                                                                                                                                                                                                    | SS-24     |                                            | 1225 |               |              |                                                    |            |                                        |                   |
| 25                                                                                                                                                                                                                                                                                    | SS-25     |                                            | 1230 |               |              |                                                    |            |                                        |                   |
| Relinquished by: (Signature)                                                                                                                                                                                                                                                          |           |                                            |      |               |              | Date: 10-17-23                                     | Time: 1305 | Received by: (Signature/Affiliation)   |                   |
| Relinquished by: (Signature)                                                                                                                                                                                                                                                          |           |                                            |      |               |              | Date: 10/17/23                                     | Time: 1705 | Received by: (Signature/Affiliation)   |                   |
| Relinquished by: (Signature)                                                                                                                                                                                                                                                          |           |                                            |      |               |              | Date:                                              | Time:      | Received by: (Signature/Affiliation)   |                   |

## Login Sample Receipt Checklist

Client: Rincon Consultants

Job Number: 570-157066-1

Login Number: 157066

List Number: 1

Creator: Yu, Tiffany

List Source: Eurofins Calscience

| Question                                                                                 | Answer | Comment |
|------------------------------------------------------------------------------------------|--------|---------|
| Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.      | N/A    |         |
| The cooler's custody seal, if present, is intact.                                        | True   |         |
| Sample custody seals, if present, are intact.                                            | True   |         |
| The cooler or samples do not appear to have been compromised or tampered with.           | True   |         |
| Samples were received on ice.                                                            | True   |         |
| Cooler Temperature is acceptable.                                                        | True   |         |
| Cooler Temperature is recorded.                                                          | True   |         |
| COC is present.                                                                          | True   |         |
| COC is filled out in ink and legible.                                                    | True   |         |
| COC is filled out with all pertinent information.                                        | True   |         |
| Is the Field Sampler's name present on COC?                                              | True   |         |
| There are no discrepancies between the containers received and the COC.                  | True   |         |
| Samples are received within Holding Time (excluding tests with immediate HTs)            | True   |         |
| Sample containers have legible labels.                                                   | True   |         |
| Containers are not broken or leaking.                                                    | True   |         |
| Sample collection date/times are provided.                                               | True   |         |
| Appropriate sample containers are used.                                                  | True   |         |
| Sample bottles are completely filled.                                                    | True   |         |
| Sample Preservation Verified.                                                            | True   |         |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs         | True   |         |
| Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4"). | True   |         |
| Multiphasic samples are not present.                                                     | True   |         |
| Samples do not require splitting or compositing.                                         | True   |         |
| Residual Chlorine Checked.                                                               | N/A    |         |

## **Attachment 3**

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Hazardous Building Materials Survey

November 3, 2023

Ms. Julie Doane Allmon  
Senior Supervising Geologist  
**Rincon Consultants, Inc.**  
805-453-8137 Mobile  
805-277-9473 Direct  
[jdallmon@rinconconsultants.com](mailto:jdallmon@rinconconsultants.com)

**Subject: Asbestos & Lead Survey Report**  
Vic Trace Reservoir – City of Santa Barbara  
La Coronilla Drive, Santa Barbara, CA  
*FCG Project Code: Rincon Consultants–37*

Dear Ms. Allman:

FCG Environmental (FCG) conducted a hazardous materials survey of the Vic Trace Reservoir, which included asbestos and lead bulk sampling. The investigation was performed on October 16, 2023, by Alan Forbess, CA Certified Asbestos Consultant (No. 94-1549) and CA Lead Inspector/Assessor and Project Monitor (No. 505/504). This report documents the results of our survey, which was conducted to identify proper handling of building materials prior to demolition or renovations to the existing reservoir.

## 1.0 Background Information / Scope of Project

**Background/Site Description:** According to information provided to FCG, the reservoir is a concrete structure roughly 382 feet long by 250 feet wide covered by a wood-framed aluminum roofing and siding. The reservoir is in-ground with upper walls and roofing above grade. A central ridge vent runs east-to-west across the length of the reservoir. The surfaces around the reservoir are paved with asphalt and concrete with concrete drainage swales to direct runoff away from the reservoir. Newer concrete paving was noted in the SW corner of the site, with fencing running along the perimeter on all sides. A valve building is located to the north of the reservoir near the main entrance on La Coronilla Drive. Limited testing was conducted from the valve building exterior only, as the building was locked and inaccessible. Please see the attached photos for additional information.

**Scope of Project:** FCG was asked to perform a survey of building materials to identify hazardous materials concerns in accordance with federal, state and local regulations. The following services were conducted to define asbestos and lead concerns at the subject site:

- A visual inspection of representative building materials was conducted to identify suspect asbestos and lead paint or other lead materials. Digital photographs were taken, and selected photos are attached for review.
- Bulk samples were collected from representative suspect materials for submittal to a qualified laboratory for asbestos analysis. All bulk samples were analyzed by SGS Forensic Analytical, a state-certified laboratory located in Carson, CA. All samples were

analyzed by polarized light microscopy (PLM), to determine asbestos fiber concentrations in bulk building material samples. PLM is applicable for the analysis of building survey submissions and other bulk materials.

- Screening for lead-based paint was conducted using an X-Ray Fluorescence (XRF) paint analyzer to screen representative surfaces and materials suspected of being coated with lead-based paint.
- All field observations, laboratory analytical data, XRF readings and other findings have been evaluated, with this written report summarizing our findings and providing recommendations as necessary.

## 2.0 Asbestos Survey Findings

**Suspect Materials:** After a visual inspection at the subject site was completed, the following suspect asbestos containing materials were noted:

- Caulking mastics inside hatches
- Caulking on roof fasteners
- Rubber washers on metal fasteners (roof)
- Concrete walls – main reservoir
- Concrete drainage swales
- Caulking in drainage swale (concrete seams)
- Asphalt pavement/surfacing around reservoir (apron)
- Concrete pavement/surfacing (apron and curbs, etc.)
- Foam insulation on underside of ridge vent
- Rubber gaskets at ridge vent
- Metal roof coating (these samples are on a separate chain-of-custody)
- Valve Building roofing materials (felts, tars, aggregate, etc.)
- Valve Building concrete walls

**Bulk Sampling Results:** FCG collected a total of 23 bulk samples from suspected asbestos containing materials at the subject site. The samples were collected and forwarded to SGS Forensic Analytical, for analysis by Polarized Light Microscopy (PLM) using EPA Method 600/R-93-116, Visual Area Estimation.

**Summary of Lab Results:** Based on laboratory analytical results, all of the suspect building materials tested as part of our survey were found to be “Non-Detect” for asbestos. **Therefore, no asbestos containing materials (ACM) were identified during our survey.** Please refer to the Attachments for a complete copy of the laboratory analytical report and our bulk sampling log sheet.

## 3.0 Limited Lead Survey

FCG was contracted to perform field testing to determine the presence of lead-based paint or lead components at the subject site. A visual inspection was conducted to identify areas of suspect lead-based paint or coatings. All fieldwork was conducted by a CA Certified Lead Inspector/Assessor. The findings of this survey will be used by contracting personnel to determine appropriate lead safe work practices prior to future site work.

**Background Information on Lead Paint Requirements:** Several regulations apply to the disturbance and possible exposure to lead from paints and other coatings. Title 17 of the California Code of Regulations (CCR) applies to residences and buildings accessible to the public that were constructed prior to 1979, and schools constructed before 1993 where lead paint may exist. Cal-OSHA regulations found within Title 8 of the CCR apply to worker exposure as stated in the Lead-in-Construction Standard (8-CCR-1532.1). The EPA recently issued a final rule to address lead-based paint hazards created by renovation, repair and painting activities that disturb lead-based paint in target housing and child-occupied facilities.

The EPA's Lead Renovation, Repair and Painting (RRP) Program was passed into regulation requiring compliance with training and certification requirements per Title 40 of the Code of Federal Regulations (40 CFR Part 745). The RRP rule states that firms and individuals conducting renovations of target housing constructed before 1978 must assume that lead is present in all painted surfaces or coatings unless a written determination has been made by a Certified Inspector that the components affected by the renovation are free of paint or other surface coatings that contain lead equal to or in excess of 1.0 milligrams per square centimeter (mg/cm<sup>2</sup>) or 0.5% by weight.

**Scope of Lead Testing Services:** FCG's scope of services involved sampling through use of bulk sampling or "paint chip" methods. Paint chip sampling methods were utilized to remove the surface coating down to the substrate to determine the presence of lead-based paint in relevant surfaces. Samples were forwarded to SGS Forensic Analytical Laboratories for analysis by EPA Methods 3050B/7000B for Total Lead using atomic adsorption and an acid digestion process. Please see the attached laboratory analytical report for detailed information.

**Bulk Sample Results:** Three bulk samples were collected from the corrugated metal roofing which appeared to be covered by a light powder coating or sealant. No other painted materials were found on the main reservoir. Bulk sampling was conducted according to the specifications described in the protocols for Risk Assessments in the Housing and Urban Development (HUD) Guidelines Chapter 5 (revised 1997). The HUD "Guidelines" are the industry standard for lead mitigation and abatement tasks. Bulk lead samples were analyzed for Total Lead by SGS Forensic Analytical, a state-certified laboratory using EPA Method 3050B/7000B using flame atomic absorption and mass spectrophotometry. Please see the table below for a summary of paint chip sample results and the attached laboratory analytical data for additional information.

**Table 1: Lead Paint Chip Sampling Results**

| Sample ID                                                                                                                                                                                                                        | Material                   | Location           | Concentration of Lead in PPM (mg/kg) | Lead Based Paint / Hazardous Waste* (Total Lead in ppm) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------|--------------------------------------|---------------------------------------------------------|
| Pb-1                                                                                                                                                                                                                             | Metal Roofing with Coating | Roof Cover - North | 12                                   | 5,000 / 1,000                                           |
| Pb-2                                                                                                                                                                                                                             | Metal Roofing with Coating | Roof Cover - West  | 22                                   | 5,000 / 1,000                                           |
| Pb-3                                                                                                                                                                                                                             | Metal Roofing with Coating | Roof Cover - South | 30                                   | 5,000 / 1,000                                           |
| Regulatory definition of Lead-Based Paint (LBP) = 5,000 ppm or 0.5% by weight.<br>Hazardous Waste definition for Total Lead = 1,000 ppm<br>Please refer to the attached laboratory analytical report for additional information. |                            |                    |                                      |                                                         |

**Summary of Bulk Sample Results for Lead:** All three of the collected bulk samples taken from the corrugated roofing and siding materials were found to be well below the state and federal definition of lead based paint (LBP) and hazardous waste criteria for Total Lead. No other painted materials were identified within the project scope. Please see the attached analytical data for a complete copy of the laboratory report and bulk sampling information.

#### **4.0 Conclusions & Recommendations**

An asbestos and lead survey of the subject site has been completed per the terms of our agreement to define hazardous materials issues prior to demolition or renovation activities. Based on our visual observations and our evaluation of analytical data, we conclude the following:

**Asbestos:**

- Based on laboratory analytical results and our visual observations, no asbestos was detected in any of the suspect building materials sampled as part of our survey. Based on these findings, no asbestos containing materials (ACM) were identified at the subject site.

**Lead:**

- No lead based paint or lead components were found at the subject site. The concrete and wood framing were unpainted, and the corrugated aluminum roofing and siding contained only minor concentrations of lead (12-30 ppm). All lead findings were well below any regulated levels. Therefore, no lead-based paint (LBP) or lead concerns were identified as part of our survey.

**General Recommendations:**

- Based on the absence of asbestos and lead within the reservoir structure, no special handling is required. Future site work may be conducted by regular construction personnel and the materials tested may be disposed of as regular construction waste.
- Our survey of the Valve Building structure was limited to roofing and exterior concrete only. We could not access the interior of the building. If this building will be demolished or renovated, additional sampling or inspection of the building interior should be conducted.
- As our survey was limited to readily accessible areas, there is potential that suspect materials previously not included or identified by our survey could be discovered during site work. This may include suspect materials located inside the parts of the reservoir underwater or not accessible during our inspection. If suspect materials are found during site demolition or renovation work, the area should be isolated, and any suspect materials tested to confirm or deny the presence of asbestos, lead or other hazards.

## **Limitations Statement**

The data compiled and evaluated as part of this assessment was limited and may not represent all conditions at the subject site. Asbestos was widely used until the late 1970's in thousands of building materials (i.e., joint compound, wallboard, thermal system insulation (TSI), acoustical ceiling, roofing material, etc.), making it difficult to locate all areas of ACM usage. This assessment reflects the data collected from the specific locations tested to identify Asbestos Containing Materials (ACM) in those locations and may not be all encompassing. There is always potential for asbestos containing materials to be missed due to problems with accessibility, and the broad variety of uses. The presence or absence of lead-based paint or lead-based paint hazards applies only to the tested or assessed surfaces on the date of the field visit. It should be understood that conditions noted within this report were accurate at the time of the inspection and in no way reflect the conditions at the property after the date of the inspection. All data collection, findings, conclusions and recommendations presented by FCG within this report are based upon limited data using current standard practices accepted within the industry. The conclusions and recommendations presented within this report are based on current regulations and the professional experience of the certified professionals involved in this project.

The data collected during this assessment and any resulting recommendations shall be used only by the client for the site described in this report. Any use or reliance of this report by a third party, including any of its information or recommendations, without the explicit authorization of the client shall be strictly at the risk of the third party.

It should not be misconstrued that this assessment has identified any or all environmental conditions at the subject site. FCG makes no representations regarding the accuracy of the enclosed data and will not be held responsible for any incidental or consequential loss or punitive damages including but not limited to, loss of profits or revenues, loss of use of a facility or land, delay in construction or action of regulatory agencies.

If you have any questions or concerns regarding the information provided, please do not hesitate to call us at 805.646.1995.

## **FCG Environmental**



---

Alan Forbes, Principal Consultant  
Certified Lead Inspector/Assessor (LRC No. 505/504)  
CA Certified Asbestos Consultant (CAC No. 94-1549)

Attachments: 1 – Analytical Lab Results & Bulk Sampling Logs (Asbestos & Lead)  
2 – Site Plan & Selected Photos  
3 – FCG Inspector Certifications

## Attachment 1

Laboratory Analytical Results for  
Asbestos & Lead Bulk Samples

Bulk Sample Log Sheets/Chain-of-Custody



# Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

NVLAP Lab Code: 101459-1

Forbess Consulting Group (FCG)  
Alan Forbess  
1009 Mercer Avenue  
  
Ojai, CA 93023

**Client ID:** 7238  
**Report Number:** B353065  
**Date Received:** 10/18/23  
**Date Analyzed:** 10/20/23  
**Date Printed:** 10/20/23  
**First Reported:** 10/20/23

**Job ID/Site:** Rincon-37; Vic Trace Reservoir; Santa Barbara**SGSFL Job ID:** 7238**Date(s) Collected:** 10/16/2023**Total Samples Submitted:** 20**Total Samples Analyzed:** 20

| Sample ID                                                       | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|-----------------------------------------------------------------|------------|---------------|------------------|---------------|------------------|---------------|------------------|
| 1                                                               | 51701610   |               |                  |               |                  |               |                  |
| Layer: Black Mastic with Debris                                 |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 2                                                               | 51701611   |               |                  |               |                  |               |                  |
| Layer: Black Mastic with Debris                                 |            |               | ND               |               |                  |               |                  |
| Layer: Grey Cementitious Material                               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 3                                                               | 51701612   |               |                  |               |                  |               |                  |
| Layer: Grey Non-Fibrous Material                                |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 4                                                               | 51701613   |               |                  |               |                  |               |                  |
| Layer: Grey Non-Fibrous Material                                |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 5                                                               | 51701614   |               |                  |               |                  |               |                  |
| Layer: Grey Non-Fibrous Material                                |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 6                                                               | 51701615   |               |                  |               |                  |               |                  |
| Layer: Grey Cementitious Material                               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 7                                                               | 51701616   |               |                  |               |                  |               |                  |
| Layer: Grey Cementitious Material                               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |

**Client Name:** Forbess Consulting Group (FCG)**Report Number:** B353065**Date Printed:** 10/20/23

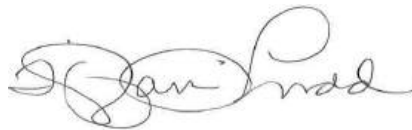
| Sample ID                                     | Lab Number | Asbestos Type        | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|-----------------------------------------------|------------|----------------------|------------------|---------------|------------------|---------------|------------------|
| <b>8</b>                                      | 51701617   |                      |                  |               |                  |               |                  |
| Layer: Grey Cementitious Material             |            |                      | <b>ND</b>        |               |                  |               |                  |
| Layer: Grey Non-Fibrous Material              |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>9</b>                                      | 51701618   |                      |                  |               |                  |               |                  |
| Layer: Grey Cementitious Material             |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>10</b>                                     | 51701619   |                      |                  |               |                  |               |                  |
| Layer: Dark Grey Non-Fibrous Material         |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>11</b>                                     | 51701620   |                      |                  |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>12</b>                                     | 51701621   |                      |                  |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>13</b>                                     | 51701622   |                      |                  |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>14</b>                                     | 51701623   |                      |                  |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>15</b>                                     | 51701624   |                      |                  |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>16</b>                                     | 51701625   |                      |                  |               |                  |               |                  |
| Layer: Grey Non-Fibrous Materials             |            |                      | <b>ND</b>        |               |                  |               |                  |
| Layer: Black Asphalt                          |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |
| <b>17</b>                                     | 51701626   |                      |                  |               |                  |               |                  |
| Layer: Grey Foam                              |            |                      | <b>ND</b>        |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | <b>Asbestos (ND)</b> |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |                      |                  |               |                  |               |                  |

**Client Name:** Forbess Consulting Group (FCG)

**Report Number:** B353065

**Date Printed:** 10/20/23

| Sample ID                                                       | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|-----------------------------------------------------------------|------------|---------------|------------------|---------------|------------------|---------------|------------------|
| 18                                                              | 51701627   |               |                  |               |                  |               |                  |
| Layer: Black Non-Fibrous Material with Debris                   |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |
| 19                                                              | 51701628   |               |                  |               |                  |               |                  |
| Layer: Multi-Layer Black Tars                                   |            |               | ND               |               |                  |               |                  |
| Layer: Multi-Layer Black Felts                                  |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (35 %)  |            | Asbestos (ND) |                  |               |                  |               |                  |
| Comment: Bulk complex sample.                                   |            |               |                  |               |                  |               |                  |
| 20                                                              | 51701629   |               |                  |               |                  |               |                  |
| Layer: Grey Cementitious Material                               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: Cellulose (Trace) |            | Asbestos (ND) |                  |               |                  |               |                  |



Tiffani Ludd, Laboratory Supervisor, Carson Laboratory

**Note:** Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by SGS Forensic Laboratories (SGSFL) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by SGSFL to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by SGSFL. The client is solely responsible for the use and interpretation of test results and reports requested from SGSFL. This report must not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government. SGSFL is not able to assess the degree of hazard resulting from materials analyzed. SGS Forensic Laboratories reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

|                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                               |                |         |            |                          |
|-------------------------------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------|------------|--------------------------|
| Client Name & Address:<br>FCG Environmental<br>1009 Mercer Avenue<br>Ojai, CA 93023 |             | Client No.: 7238                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PO / Job#: Rincon-37                                                                                                                                                                                          | Date: 10/16/23 |         |            |                          |
| Contact: Alan Forbess                                                               |             | Phone: (805) 646-1995                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Turn Around Time: Same Day / 1Day / 2Day / 3Day / 4Day / 5Day                                                                                                                                                 |                |         |            |                          |
| E-mail: aforbess@fcgenviro.com bforbess@fcgenviro.com                               |             | <input type="checkbox"/> PCM: <input type="checkbox"/> NIOSH 7400A / <input type="checkbox"/> NIOSH 7400B <input type="checkbox"/> Rotometer                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                               |                |         |            |                          |
| Site Name: Vic Trace Reservoir                                                      |             | <input checked="" type="checkbox"/> PLM: <input checked="" type="checkbox"/> Standard / <input type="checkbox"/> Point Count 400-1000 / <input type="checkbox"/> CARB 435                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                               |                |         |            |                          |
| Site Location: Santa Barbara                                                        |             | <input type="checkbox"/> TEM Air: <input type="checkbox"/> AHERA / <input type="checkbox"/> Yamate2 / <input type="checkbox"/> NIOSH 7402<br><input type="checkbox"/> TEM Bulk: <input type="checkbox"/> Quantitative / <input type="checkbox"/> Qualitative / <input type="checkbox"/> Chatfield<br><input type="checkbox"/> TEM Water: <input type="checkbox"/> Potable / <input type="checkbox"/> Non-Potable / <input type="checkbox"/> Weight %<br><input type="checkbox"/> TEM Dust: <input type="checkbox"/> D5755 (microvac) / <input type="checkbox"/> D6480 (wipe) |                                                                                                                                                                                                               |                |         |            |                          |
| Comments:                                                                           |             | <input type="checkbox"/> IAQ Particle Identification <input type="checkbox"/> Opaques/Char (Wildfire)<br><input type="checkbox"/> Limited Particle ID (Wildfire) <input type="checkbox"/> Special Project<br><input type="checkbox"/> Metals Analysis Matrix: Method:<br>Analytes:                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                               |                |         |            |                          |
|                                                                                     |             | <input type="checkbox"/> Silica in Air <input type="checkbox"/> w/Gravimetry<br><input type="checkbox"/> Quartz Only                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                               |                |         |            |                          |
| Sample ID                                                                           | Date / Time | Sample Location / Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FOR AIR SAMPLES ONLY                                                                                                                                                                                          |                |         |            | Sample Area / Air Volume |
|                                                                                     |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Type                                                                                                                                                                                                          | Time On/Off    | Avg LPM | Total Time |                          |
| 1                                                                                   | 10/16/23    | Caulking mastic-N. Hatch (inside)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 2                                                                                   |             | " " - "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 3                                                                                   |             | Caulking on Roof fasteners (N)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 4                                                                                   |             | " " (West)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 5                                                                                   |             | " " (East)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 6                                                                                   |             | concrete Footing (main Reservoir) - N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 7                                                                                   |             | " " - W                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 8                                                                                   |             | " " - S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 9                                                                                   |             | Concrete Drainage Swale (NE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| 10                                                                                  |             | Rubber Washers on metal fasteners                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A<br>P<br>C                                                                                                                                                                                                   |                |         |            |                          |
| Sampled By: Alan Forbess                                                            |             | Date/Time: 10/16/23                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Shipped Via: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> US Mail <input type="checkbox"/> Courier <input type="checkbox"/> Drop Off <input type="checkbox"/> Other: |                |         |            |                          |
| Relinquished By: Alan Forbess                                                       |             | Relinquished By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Relinquished By:                                                                                                                                                                                              |                |         |            |                          |
| Date / Time: 10/17/23                                                               |             | Date / Time:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Date / Time:                                                                                                                                                                                                  |                |         |            |                          |
| Received By: [Signature]                                                            |             | Received By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Received By:                                                                                                                                                                                                  |                |         |            |                          |
| Date / Time: 10/18/23 9:18AM FIC                                                    |             | Date / Time:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Date / Time:                                                                                                                                                                                                  |                |         |            |                          |
| Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No      |             | Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                |                |         |            |                          |

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Chicago Office: 3020 Woodcreek Drive, Suite C, Downers Grove, IL 60515 • Phone: 341/465-2464

Client Name & Address:  
FCG Environmental  
1009 Mercer Avenue  
Ojai, CA 93023

Client No.: 7238

Pg 2 of 2

PO / Job#: Rincon-37

Date: 10-16-23

Turn Around Time: Same Day / 1Day / 2Day / 3Day / 4Day / 5Day

☐ PCM: ☐ NIOSH 7400A / ☐ NIOSH 7400B ☐ Rotometer

☒ PLM: ☒ Standard / ☐ Point Count 400 / 1000 / ☐ CARB 435

☐ TEM Air: ☐ AHERA / ☐ Yamate2 / ☐ NIOSH 7402  
☐ TEM Bulk: ☐ Quantitative / ☐ Qualitative / ☐ Chatfield  
☐ TEM Water: ☐ Potable / ☐ Non-Potable / ☐ Weight %  
☐ TEM Dust: ☐ D5755 (microvac) / ☐ D6480 (wipe)

☐ IAQ Particle Identification ☐ Opaques/Char (Wildfire)  
☐ Limited Particle ID (Wildfire) ☐ Special Project

☐ Metals Analysis Matrix: Method:  
Analytes:

Contact: Alan Forbess Phone: (805) 646-1995

E-mail: aforbess@fcgenviron.com bforbess@fcgenviron.com

Site Name: Vic Trace Reservoir

Site Location: Santa Barbara

Comments:

☐ Silica in Air ☐ w/Gravimetry  
☐ Quartz Only

| Sample ID | Date / Time | Sample Location / Description      | FOR AIR SAMPLES ONLY                                                                              |             |         |            | Sample Area / Air Volume |
|-----------|-------------|------------------------------------|---------------------------------------------------------------------------------------------------|-------------|---------|------------|--------------------------|
|           |             |                                    | Type                                                                                              | Time On/Off | Avg LPM | Total Time |                          |
| 11        | 10/16/23    | Asphalt apron - N                  | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 12        |             | " " - W                            | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 13        |             | " " - E                            | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 14        |             | " " - S                            | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 15        |             | Concrete Apron - Newer (SW corner) | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 16        |             | Caulking in drainage swale         | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 17        |             | Foam Insulation on Ridge Vent      | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 18        |             | Rubber Gasket - Ridge Vent         | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 19        |             | Pump House - Roofing               | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |
| 20        |             | " " - Concrete Wall                | <input checked="" type="checkbox"/> A<br><input type="checkbox"/> P<br><input type="checkbox"/> C |             |         |            |                          |

Sampled By: Alan Forbess Date/Time: 10/16/23

Shipped Via: ☐ Fed Ex ☐ UPS ☐ US Mail ☐ Courier ☐ Drop Off ☐ Other:

Relinquished By: Alan Forbess Relinquished By: Relinquished By:

Date / Time: 10/17/23 3:30 PM Date / Time: Date / Time:

Received By: Received By: Received By:

Date / Time: 10/18/23 9:18 AM FCG Date / Time: Date / Time:

Condition Acceptable? ☐ Yes ☐ No Condition Acceptable? ☐ Yes ☐ No Condition Acceptable? ☐ Yes ☐ No

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# Bulk Asbestos Analysis

(EPA Method 40CFR, Part 763, Appendix E to Subpart E and EPA 600/R-93-116, Visual Area Estimation)

NVLAP Lab Code: 101459-1

Forbess Consulting Group (FCG)

Alan Forbess

1009 Mercer Avenue

Ojai, CA 93023

Client ID: 7238

Report Number: B353084

Date Received: 10/18/23

Date Analyzed: 10/20/23

Date Printed: 10/20/23

First Reported: 10/20/23

Job ID/Site: Rincon - 37; Vic Trace Reservoir, Santa Barbara

SGSFL Job ID: 7238

Date(s) Collected: 10/16/2023

Total Samples Submitted: 3

Total Samples Analyzed: 3

| Sample ID                                     | Lab Number | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer | Asbestos Type | Percent in Layer |
|-----------------------------------------------|------------|---------------|------------------|---------------|------------------|---------------|------------------|
| <b>Pb - 1</b>                                 | 51701748   |               |                  |               |                  |               |                  |
| Layer: Silver Metal with Debris               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | Asbestos (ND) |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |               |                  |               |                  |               |                  |
| <b>Pb - 2</b>                                 | 51701749   |               |                  |               |                  |               |                  |
| Layer: Silver Metal with Debris               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | Asbestos (ND) |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |               |                  |               |                  |               |                  |
| <b>Pb - 3</b>                                 | 51701750   |               |                  |               |                  |               |                  |
| Layer: Silver Metal with Debris               |            |               | ND               |               |                  |               |                  |
| Total Composite Values of Fibrous Components: |            | Asbestos (ND) |                  |               |                  |               |                  |
| Cellulose (Trace)                             |            |               |                  |               |                  |               |                  |

Tiffani Ludd, Laboratory Supervisor, Carson Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

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# Metals Analysis of Bulks - TTLC

(AIHA-LAP, LLC Accreditation, Lab ID #101629)

Forbess Consulting Group (FCG)

Alan Forbess

1009 Mercer Avenue

Ojai, CA 93023

Client ID: 7238

Report Number: M254942

Date Received: 10/18/23

Date Analyzed: 10/20/23

Date Printed: 10/20/23

First Reported: 10/20/23

Job ID / Site: Rincon - 37; Vic Trace Reservoir, Santa Barbara

Date(s) Collected: 10/16/2023

SGSFL Job ID: 7238

Total Samples Submitted: 3

Total Samples Analyzed: 3

| Sample Number | Lab Number | Analyte | Result | Result Units | Reporting Limit* | Method Reference |
|---------------|------------|---------|--------|--------------|------------------|------------------|
| PB-1          | LM259927   | Pb      | 12     | mg/kg        | 8                | EPA 3050B/7000B  |
| PB-2          | LM259928   | Pb      | 22     | mg/kg        | 9                | EPA 3050B/7000B  |
| PB-3          | LM259929   | Pb      | 30     | mg/kg        | 20               | EPA 3050B/7000B  |

\* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Beatriz Hinojosa, Laboratory Supervisor, Carson Laboratory

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Note\* Sampling data used in this report was provided by the client as noted on the associated chain of custody form.



|                                                                                                                                                                                                                                |  |                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Client Name & Address:<br>FCG Environmental<br>1009 Mercer Avenue<br>Ojai, CA 93023                                                                                                                                            |  | Client No.: 7238      |  | PO / Job#: <u>Rincon - 37</u> Date: <u>10/16/23</u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
| Turn Around Time: <input type="checkbox"/> Same Day / <input type="checkbox"/> 1Day / <input checked="" type="checkbox"/> 2Day / <input type="checkbox"/> 3Day / <input type="checkbox"/> 4Day / <input type="checkbox"/> 5Day |  |                       |  | <input type="checkbox"/> PCM: <input type="checkbox"/> NIOSH 7400A / <input type="checkbox"/> NIOSH 7400B <input type="checkbox"/> Rotometer                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
| <input checked="" type="checkbox"/> PLM: <input checked="" type="checkbox"/> Standard / <input type="checkbox"/> Point Count <input type="checkbox"/> 400 - <input type="checkbox"/> 1000 / <input type="checkbox"/> CARB 435  |  |                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Contact: Alan Forbess                                                                                                                                                                                                          |  | Phone: (805) 646-1995 |  | <input type="checkbox"/> TEM Air: <input type="checkbox"/> AHERA / <input type="checkbox"/> Yamate2 / <input type="checkbox"/> NIOSH 7402<br><input type="checkbox"/> TEM Bulk: <input type="checkbox"/> Quantitative / <input type="checkbox"/> Qualitative / <input type="checkbox"/> Chatfield<br><input type="checkbox"/> TEM Water: <input type="checkbox"/> Potable / <input type="checkbox"/> Non-Potable / <input type="checkbox"/> Weight %<br><input type="checkbox"/> TEM Dust: <input type="checkbox"/> D5755 (microvac) / <input type="checkbox"/> D6480 (wipe) |  |
| E-mail: aforbess@fcgenviron.com bforbess@fcgenviron.com                                                                                                                                                                        |  |                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| Site Name: <u>Vic Trace Reservoir</u>                                                                                                                                                                                          |  |                       |  | <input type="checkbox"/> IAQ Particle Identification <input type="checkbox"/> Opaques/Char (Wildfire)<br><input type="checkbox"/> Limited Particle ID (Wildfire) <input type="checkbox"/> Special Project                                                                                                                                                                                                                                                                                                                                                                    |  |
| Site Location: <u>Santa Barbara</u>                                                                                                                                                                                            |  |                       |  | <input checked="" type="checkbox"/> Metals Analysis Matrix: <u>Metal</u> Method: <u>Total Lead</u><br>Analytes: <u>Total Lead</u>                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| Comments: <u>Please run for asbestos and Total Lead</u>                                                                                                                                                                        |  |                       |  | <input type="checkbox"/> Silica in Air <input type="checkbox"/> w/Gravimetry<br><input type="checkbox"/> Quartz Only                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |

| Sample ID   | Date / Time     | Sample Location / Description           | FOR AIR SAMPLES ONLY                                                                                                                                                                           |             |         |            | Sample Area / Air Volume |
|-------------|-----------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------|------------|--------------------------|
|             |                 |                                         | Type                                                                                                                                                                                           | Time On/Off | Avg LPM | Total Time |                          |
| <u>Ap-1</u> | <u>10/16/23</u> | <u>Metal Roofing w/creosote (North)</u> | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
| <u>Pb-2</u> |                 | <u>" " (West)</u>                       | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
| <u>Pb-3</u> |                 | <u>" " (South)</u>                      | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |
|             |                 |                                         | <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> A<br/> <input type="checkbox"/> P<br/> <input type="checkbox"/> C         </div> |             |         |            |                          |

|                                                                                |  |                                                                                                                                                                                                               |  |
|--------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Sampled By: <u>Alan Forbess</u> Date/Time: <u>10/16/23</u>                     |  | Shipped Via: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> US Mail <input type="checkbox"/> Courier <input type="checkbox"/> Drop Off <input type="checkbox"/> Other: |  |
| Relinquished By: <u>Alan Forbess</u>                                           |  | Relinquished By:                                                                                                                                                                                              |  |
| Date / Time: <u>10/16/23 3:30</u>                                              |  | Date / Time:                                                                                                                                                                                                  |  |
| Received By: <u>10/18/23 9:18AM F/E</u>                                        |  | Received By:                                                                                                                                                                                                  |  |
| Date / Time:                                                                   |  | Date / Time:                                                                                                                                                                                                  |  |
| Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No |  | Condition Acceptable? <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                                                                                |  |

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## Attachment 2

### Site Plan & Selected Photos



Site Plan - Vic Trace Reservoir



Vic Trace Reservoir, looking south showing metal roofing and siding over concrete structure with asphalt paving on perimeter.



Vic Trace Reservoir, looking west showing drainage swale and fencing beyond the asphalt paving along the perimeter, with the covered reservoir on the left.



Corrugated  
metal roofing  
and siding.



Ridge vent  
along center of  
roof cover.





Open screen  
along both sides  
of ridge vent.

Access hatch on  
north side of  
roofing.





Stairs leading  
down into the  
reservoir from  
the hatch.



Caulking/mastics used  
to seal around raised  
edges and seams.



Silicon caulking  
found around  
roof fasteners.





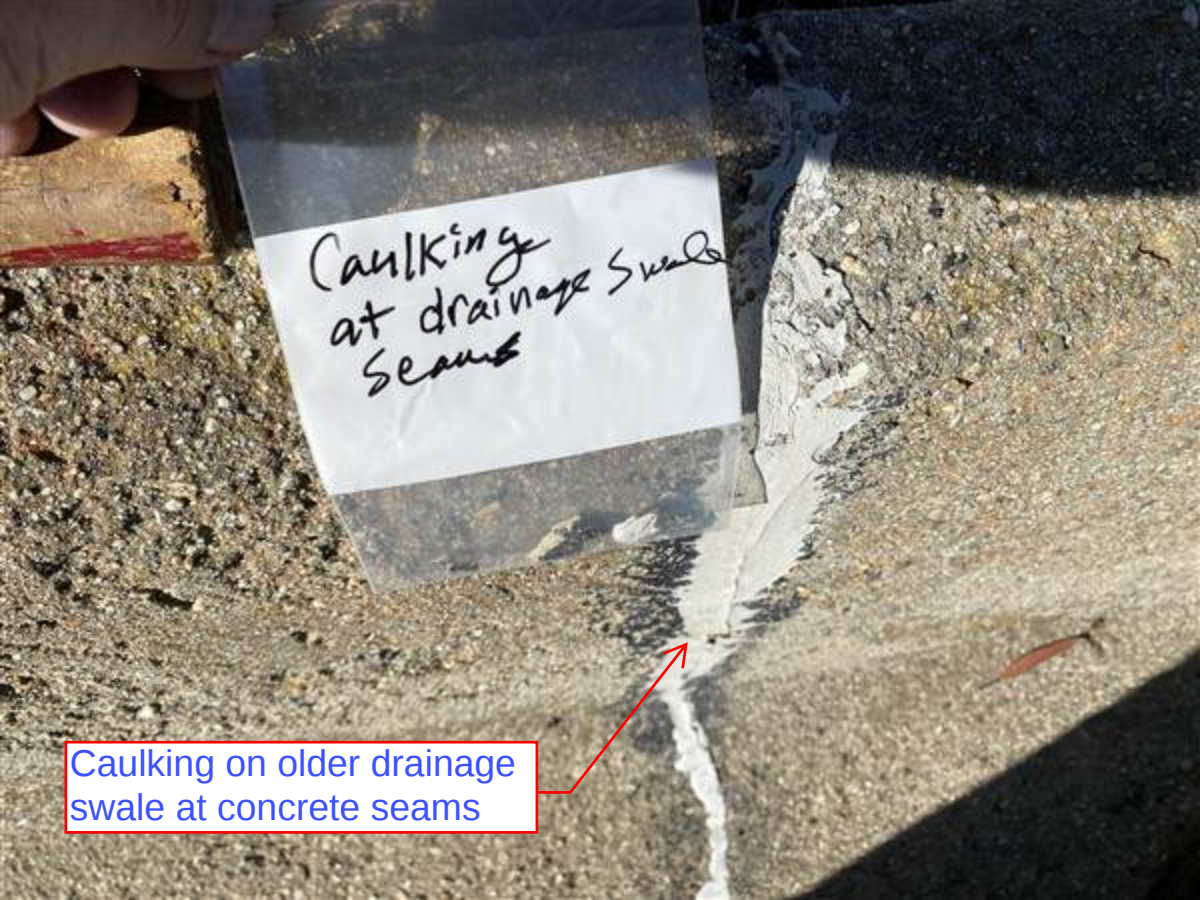
Typical construction using fasteners and caulking for roof assembly.

The image shows a close-up of a metal roof assembly. A dark, textured metal panel is being fastened to a lighter-colored, ribbed metal structure. Two red arrows point to the fasteners: one points to a small, dark fastener further up the panel, and the other points to a larger, more prominent fastener with a white, circular seal or cap. The background shows a gravel surface and a shadow of the roof structure.

Newer concrete  
drainage channel on  
southwest side of  
reservoir.





A hand is holding a clear plastic bag with a white label. The label has handwritten text in black ink. The bag is positioned over a concrete drainage swale. The swale is a narrow, V-shaped channel in the concrete, filled with a white, textured material. The concrete surface is rough and weathered. A red arrow points from a text box at the bottom left to the white material in the swale.

Caulking  
at drainage Swale  
seams

Caulking on older drainage  
swale at concrete seams



Foam insulation  
on underside of  
ridge vent.



Caulking used to  
seal ridge vent  
seams.

Valve Building  
on north side of  
property near the  
main gate.





Valve Building is  
a concrete  
structure with  
built-up roofing



Painted valves and piping near valve building. This was not sampled for lead or asbestos.

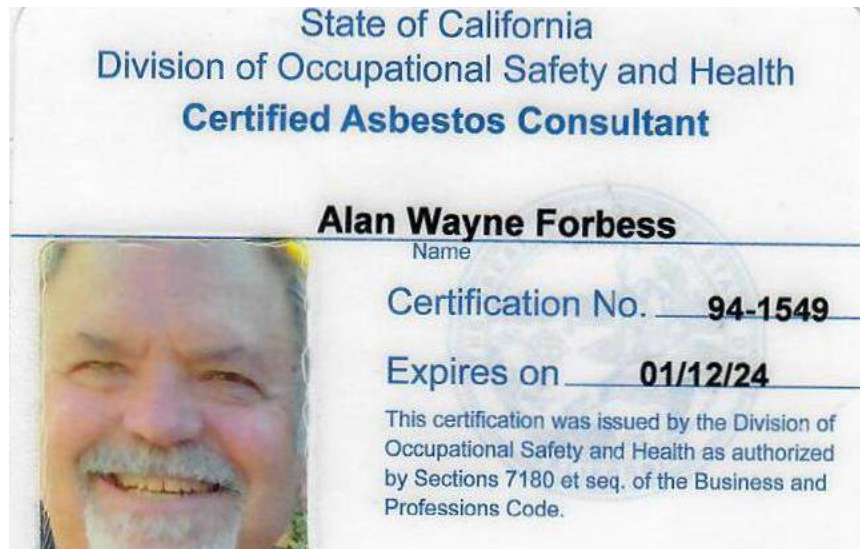


Surge tank and piping on south side of valve building. No sampling was conducted due to access issues.

## Attachment 3

### FCG Inspector Certifications

## Alan W. Forbess, Certifications (2023-2024)



|                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                    |                |                         |                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------|-------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                 | STATE OF CALIFORNIA<br>DEPARTMENT OF PUBLIC HEALTH |                |                         |  |
| <b>LEAD-RELATED CONSTRUCTION CERTIFICATE</b>                                                                                                                                                                                                                                                                                                                                                                                     |                                                    |                |                         |                                                                                     |
| <b>INDIVIDUAL:</b>                                                                                                                                                                                                                                                                                                                                                                                                               | <b>CERTIFICATE TYPE:</b>                           | <b>NUMBER:</b> | <b>EXPIRATION DATE:</b> |                                                                                     |
| <br><b>Alan Forbess</b>                                                                                                                                                                                                                                                                                                                       | Lead Inspector/Assessor                            | LRC-00000505   | 6/20/2024               |                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lead Project Monitor                               | LRC-00000504   | 6/20/2024               |                                                                                     |
| <p>Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at <a href="http://www.cdph.ca.gov/programs/clppb">www.cdph.ca.gov/programs/clppb</a> or calling (800) 597-LEAD</p> |                                                    |                |                         |                                                                                     |



## FCG Staff Certifications – William A. Miller

State of California  
Division of Occupational Safety and Health  
**Certified Site Surveillance Technician**

**William A Miller**



Name

Certification No. **07-4160**

Expires on **03/22/24**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.



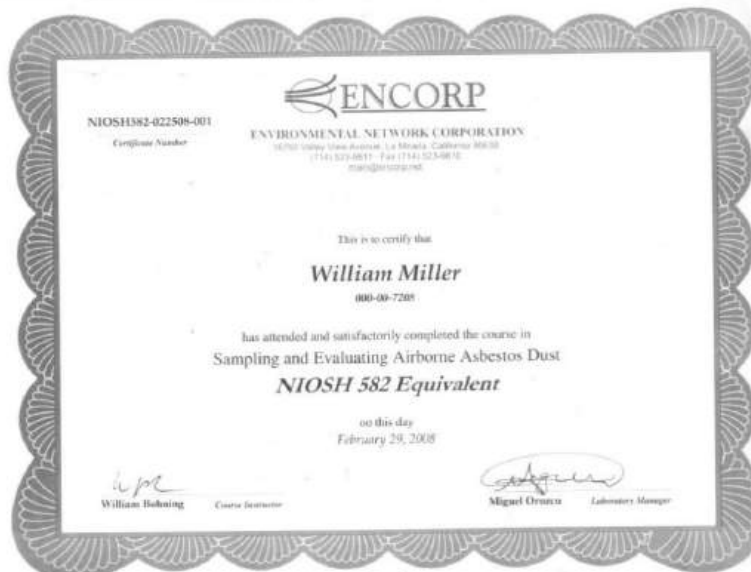
STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC HEALTH



### LEAD-RELATED CONSTRUCTION CERTIFICATE

| INDIVIDUAL:    | CERTIFICATE TYPE:       | NUMBER:      | EXPIRATION DATE: |
|----------------|-------------------------|--------------|------------------|
| William Miller | Lead Inspector/Assessor | LRC-00000721 | 6/13/2024        |
|                | Lead Project Monitor    | LRC-00000720 | 6/13/2024        |

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at [www.cdph.ca.gov/programs/clppb](http://www.cdph.ca.gov/programs/clppb) or calling (800) 597-LEAD



# Blake Forbess Certifications 2023

## State of California Division of Occupational Safety and Health **Certified Site Surveillance Technician**



**Blake R Forbess**  
Name

Certification No. **18-6328**

Expires on **11/15/23**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.



STATE OF CALIFORNIA  
DEPARTMENT OF PUBLIC HEALTH



### LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:



Blake Forbess

CERTIFICATE TYPE:

Lead Sampling Technician

NUMBER:

LRC-00003725

EXPIRATION DATE:

10/31/2023

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at [www.cdph.ca.gov/programs/clppb](http://www.cdph.ca.gov/programs/clppb) or calling (800) 597-LEAD