Biological Resources Technical Report and Western Riverside County Multiple Species Habitat Conservation Plan Consistency Analysis for the Camp Ronald McDonald for Good Times Project

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1 INTRODUCTION

Camp Ronald McDonald for Good Times proposes to construct new buildings and facilities on the approximately 59.14-acre campground within an unincorporated portion of Riverside County near the City of Idyllwild (the project site). The project will be developed in three phases over a multiple year period and includes housing and recreation facilities.

This Biological Resources Technical Report and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Consistency Analysis summarizes the results of an investigation conducted to describe the existing conditions of the biological resources on the project site, including a 200-foot buffer (study area). This report describes the vegetation communities, plants, wildlife; existing and potential special-status wildlife and plant species; wildlife movement; and jurisdictional waters within the study area. This report also describes the consistency of the project with the requirements of the MSHCP administered by the Regional Conservation Authority (RCA). The biological significance of these resources and potential project impacts are evaluated, and measures are recommended to avoid, minimize, or mitigate potential impacts to less-than-significant levels.

1.1 Project Location

The project site is located northeast of the Apple Canyon Road and State Route 74 (SR-74) intersection, near the City of Idyllwild within unincorporated Riverside County, California (Figure 1). The project site is only bounded by Apple Canyon Road to the south, and surrounded by open space to the north, east, and west. The project site is situated in Section 4 of Township 6 South, Range 3 East of the Idyllwild 7.5-minute U.S. Geological Survey (USGS) quadrangle map (USGS 2010) (Figure 2). The center point latitude is 33.678276°, and the longitude is -116.673879°.

1.2 Project Description

The Camp Ronald McDonald for Good Times project site has been developed in phases over the past 20 years. The first phase of constructed was completed in 1997 with the establishment of the Brotman Infirmary Units 1, 2, 3, and 4. Phase II was implemented in 2013 with the construction of camper units, dining hall and activity center, activity fields, basketball court, and other site developments including paths and utilities. The proposed improvements evaluated in this technical report will occur in the following next three phases:

- Phase II will involve the demolition of housing units on USFS property and existing structures, as needed. Additionally, the following new structures will be constructed:

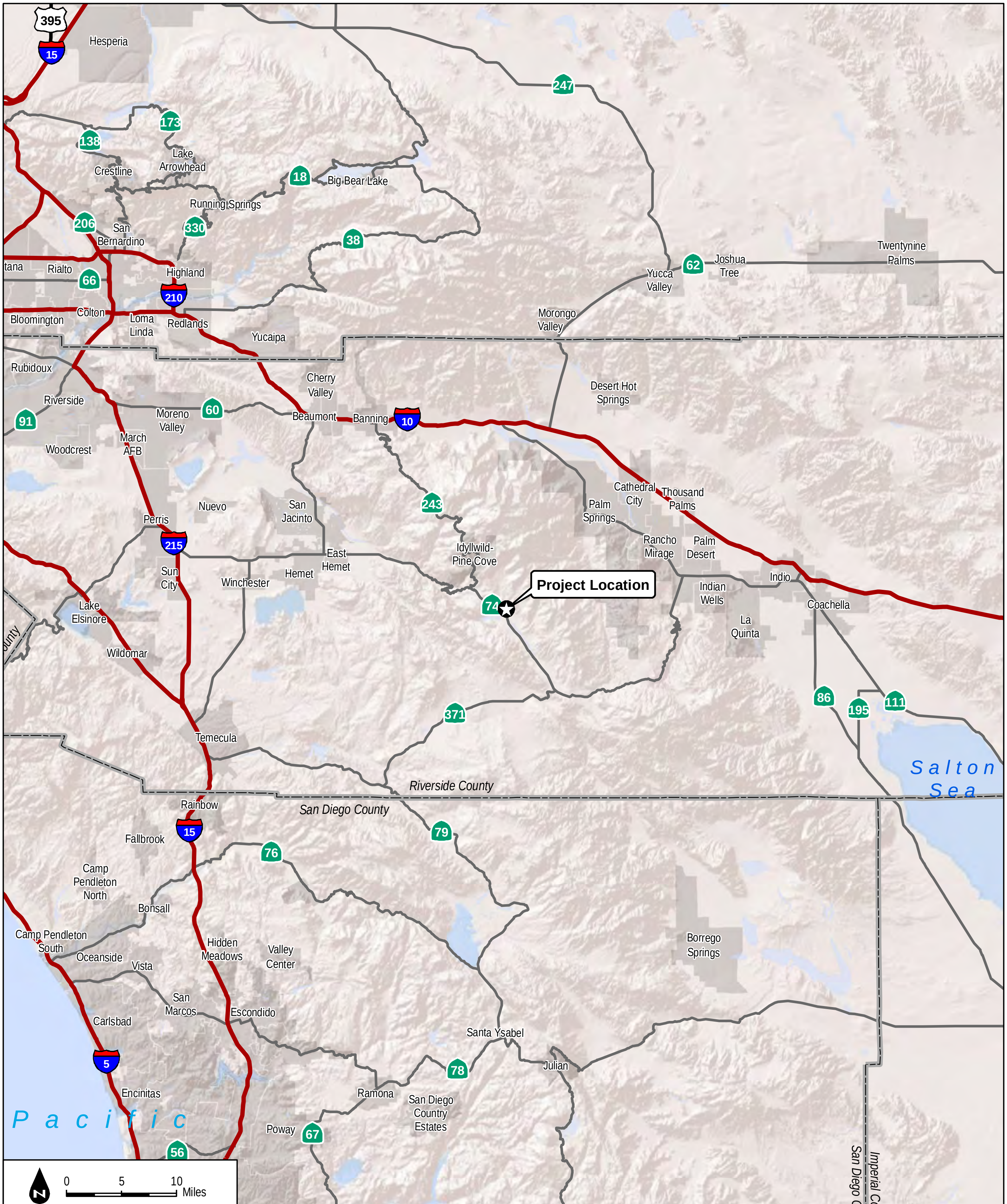
camper units, staff housing, amphitheater, maintenance building, basketball court and horseback riding roof structures;

- Phase III will involve the construction of an administrative/ entry station and parking, staff housing, caretaker residences and medical staff housing; and
- Phase IV will involve the demolition of the existing pool, pool house, and existing structures, as needed. Additionally, the following new structures will be constructed: camper housing units, pool facility and creative arts activity spaces.

Figure 4 illustrates the proposed site plan and new building/facility footprints.

1.3 Project Site Relationship to the MSCHP

The project site is within the boundaries of the MSHCP. A Geographic Information System (GIS) overlay of MSHCP data with the project site boundary shows that the project site lies within the REMAP Plan Area, but outside any Criteria Area (Figure 3). The entire project site is within the Narrow Endemic Plant Species Survey Area and Amphibian Species Survey Area, which requires suitable habitat determinations and possible focused surveys to determine presence or absence of the species. The project site is not located within the MSHCP Survey Areas for burrowing owls, mammals, or criteria area species. Additionally, the project site also occurs within the eastern portion of Existing Core K (San Bernardino National Forest), which provides the largest block of protected habitat under the MSHCP.



SOURCE: ESRI 2017

FIGURE 1

Regional Map

Camp Ronald McDonald for Good Times Project

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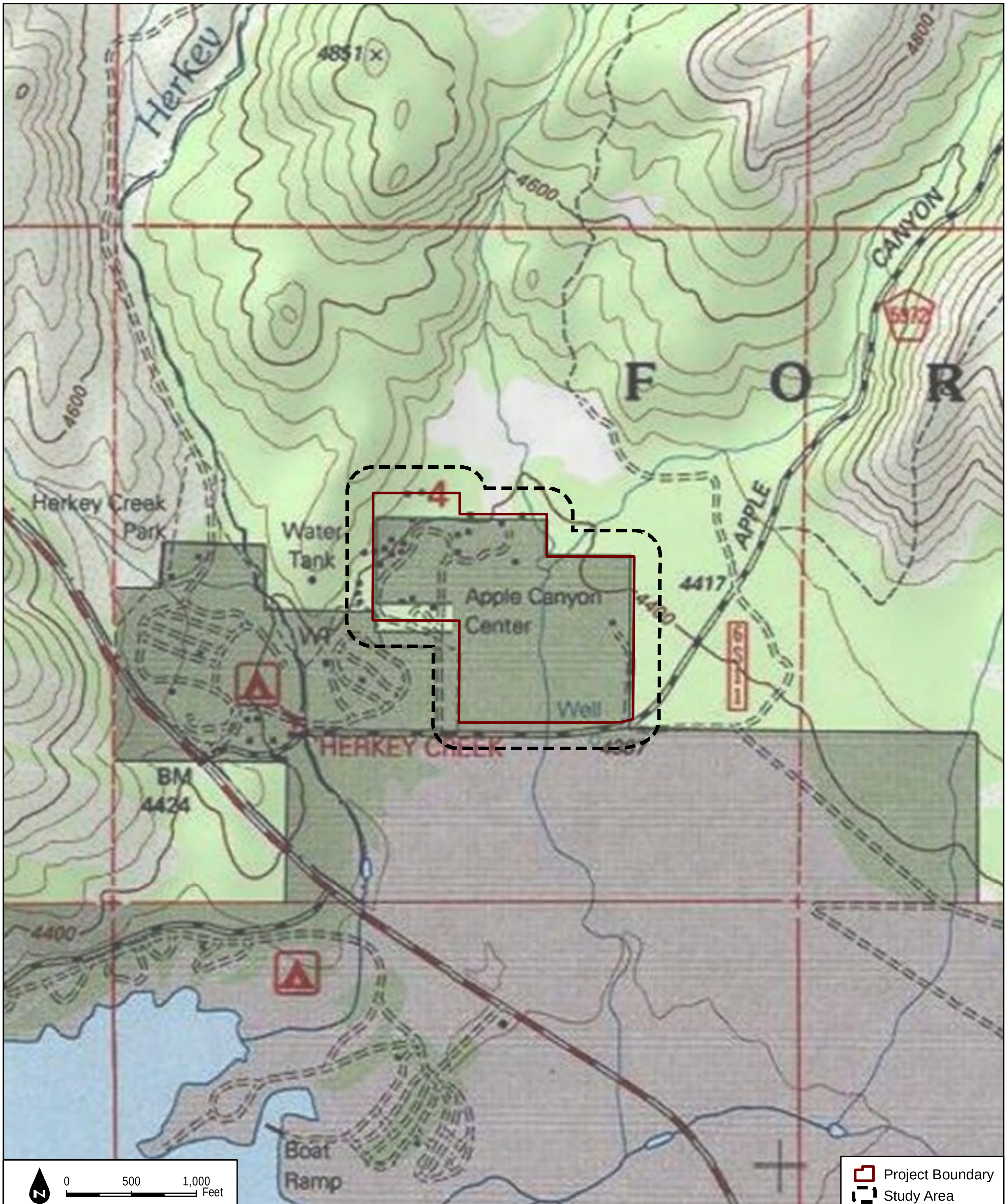

USGS 7.5-Minute Series Idyllwild Quadrangle.

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FIGURE 2

Vicinity Map

Camp Ronald McDonald for Good Times Project

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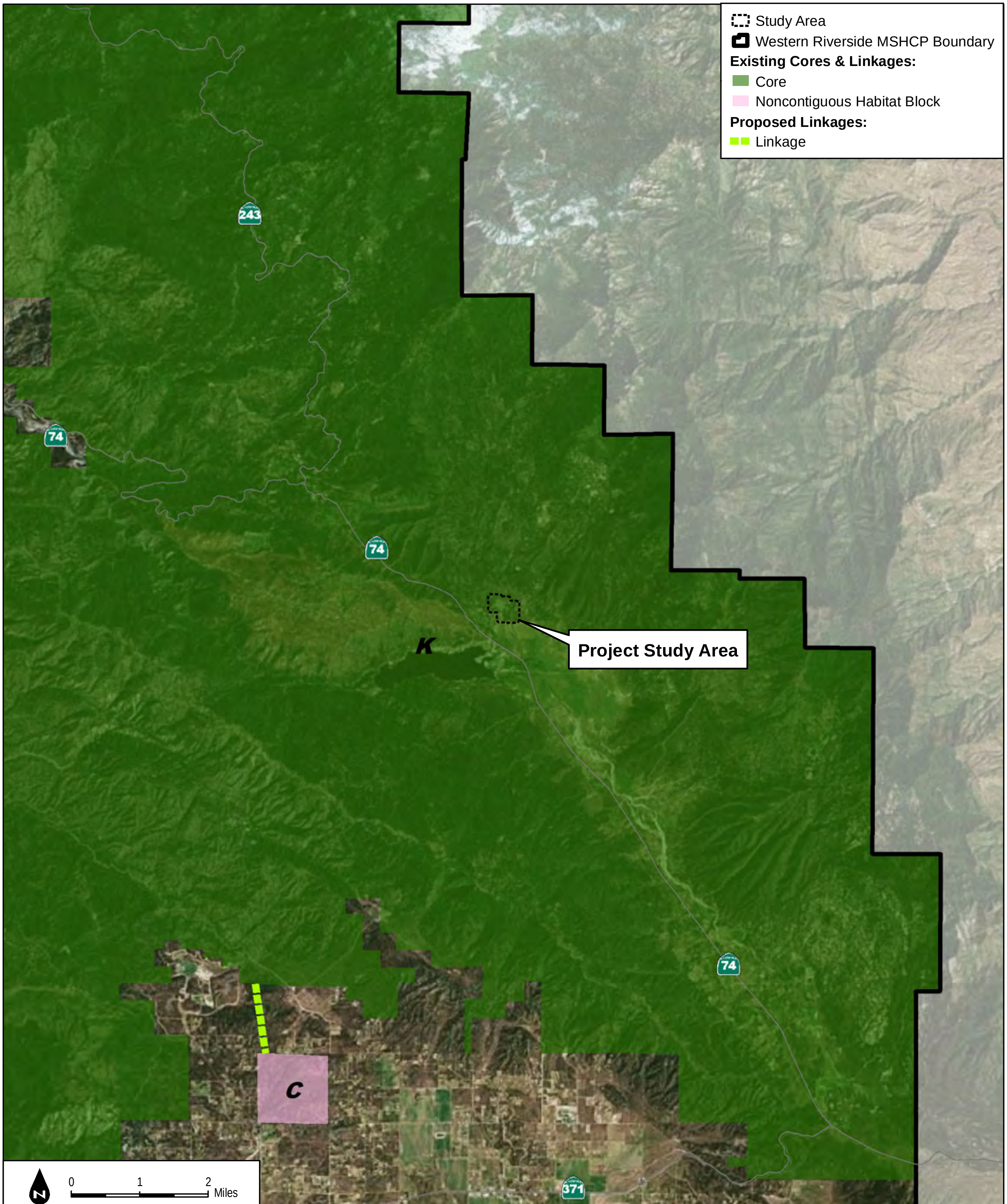

SOURCE: Western Riverside County Regional Conservation Authority 2016; Riverside County 2017; Bing Maps 2017

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FIGURE 3
MSHCP Conservation Areas

Camp Ronald McDonald for Good Times Project

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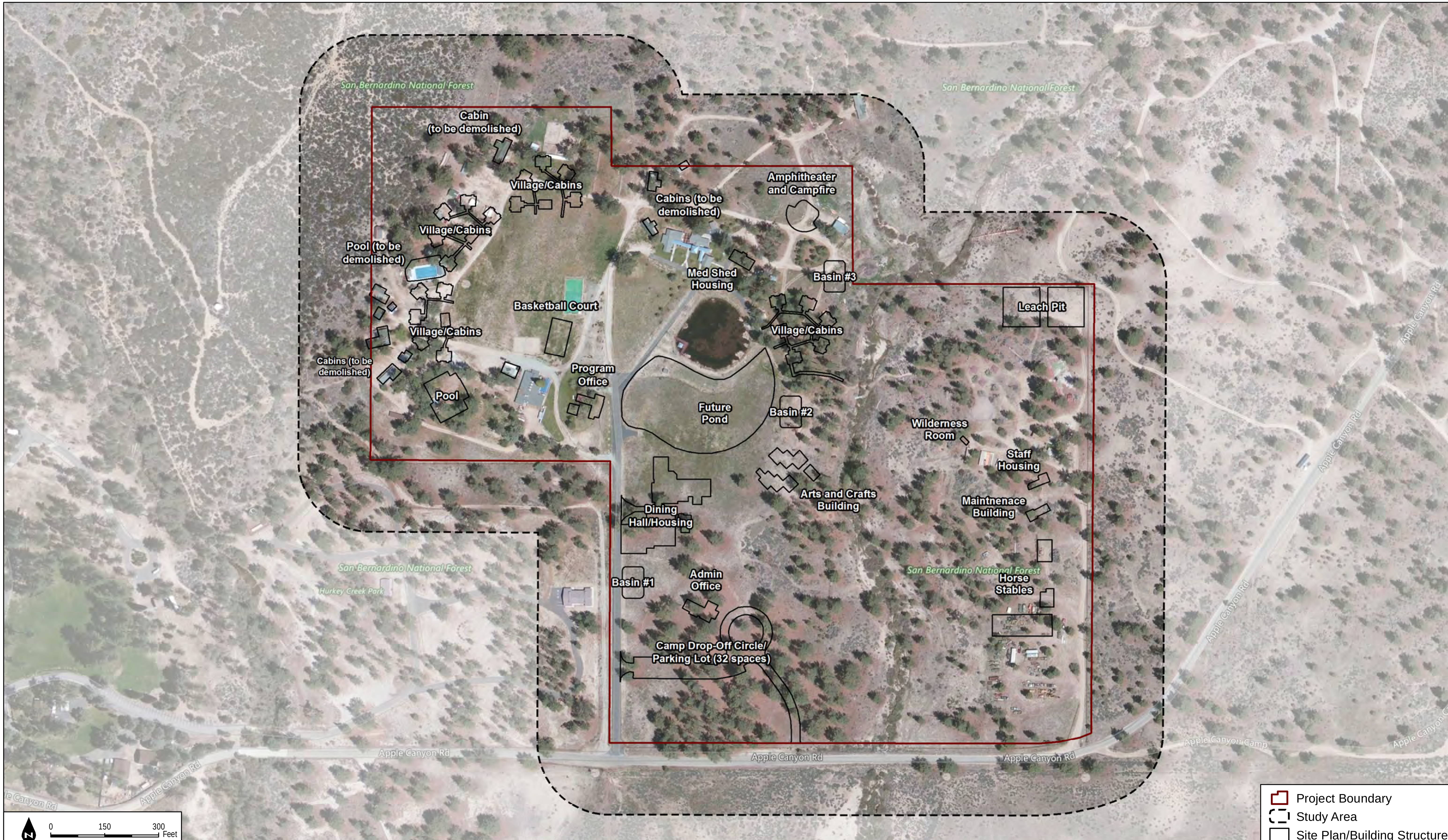

SOURCE: Bing Maps, 2017

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FIGURE 4

Site Plan

Camp Ronald McDonald for Good Times Project

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2 REGULATORY SETTING

This section outlines the federal, state, and local regulations pertinent to the biological resources located in the proposed project site.

2.1 Federal

2.1.1 Federal Endangered Species Act

The federal Endangered Species Act (FESA) of 1973 (16 U.S.C. 1531 et seq.), as amended, is administered by the USFWS for most plant and animal species and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service for certain marine species. This legislation is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend and provide programs for the conservation of those species, thus preventing the extinction of plants and wildlife. The FESA defines an endangered species as “any species that is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” Under FESA, it is unlawful to “take” any listed species, and “take” is defined as, “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”

FESA allows for the issuance of incidental take permits for listed species under Section 7, which is generally available for projects that also require other federal agency permits or other approvals, and under Section 10, which provides for the approval of Habitat Conservation Plans (HCPs) on private property without any other federal agency involvement.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) was originally passed in 1918 as four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The primary motivation for the international negotiations was to stop the “indiscriminate slaughter” of migratory birds by market hunters and others. The MBTA protects over 800 species of birds (including their parts, eggs, and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

2.2 State

2.2.1 State of California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species listed by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife, but insects and other invertebrates may not be listed. Take is defined similarly to FESA and is prohibited for both listed and candidate species. Take authorization may be obtained by the project applicant from the CDFW under the CESA Section 2081, which allows take of a listed species for educational, scientific, or management purposes. In this case, private developers consult with CDFW to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, funding of implementation, and monitoring of mitigation measures.

Other Sections of the California Fish and Game Code

Sections 3511, 4700, 5050, and 5515 of the Fish and Game Code outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. CDFW cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances, such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock. Furthermore, it is the responsibility of the CDFW to maintain viable populations of all native species. Toward that end, the CDFW has designated certain vertebrate species as Species of Special Concern, because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

2.2.2 California Native Plant Protection Act

The Native Plant Protection Act of 1977 directed the CDFW to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The Native Plant Protection Act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. The CESA expanded on the original Native Plant Protection Act and enhanced legal protection for plants, but the Native Plant Protection Act remains part of the Fish and Game Code. To align with federal regulations, the CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the act as threatened species, but did not do so for rare plants.

Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Because rare plants are not included in the CESA, mitigation measures for impacts to rare plants are specified in a formal agreement between CDFW and the project proponent.

2.2.3 California Environmental Quality Act

California Environmental Quality Act (CEQA) requires identification of a project's potentially significant impacts on biological resources and ways that such impacts can be avoided, minimized, or mitigated. The act also provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts.

CEQA Guidelines Section 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors." A rare animal or plant is defined in Section 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guidelines Section 15380(c).

CDFW has developed a list of "Special Species" as "a general term that refers to all of the taxa the California Natural Diversity Database (CNDDB) is interested in tracking, regardless of their legal or protection status." This is a broader list than those species that are protected under the FESA, CESA, and other Fish and Game Code provisions, and includes lists developed by other organizations, including for example the Audubon Watch List Species. Guidance documents prepared by other agencies, including the BLM Sensitive Species and USFWS Birds of Special Concern, are also included on this CDFW Special Species list. Additionally, CDFW has concluded that plant species included on the California Native Plant Society's (CNPS's) California Rare Plant Rank (CRPR) List 1 and 2, and potentially some List 3 plants, are covered by CEQA Guidelines Section 15380.

Section IV, Appendix G (Environmental Checklist Form), of the CEQA Guidelines requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service."

2.3 Local

2.3.1 Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County MSHCP is a comprehensive, multi-jurisdictional habitat conservation plan focusing on conservation of species and their associated habitats in Western Riverside County. The MSHCP is one of several large, multijurisdictional habitat-planning efforts in Southern California with the overall goal of maintaining biological and ecological diversity within a rapidly urbanizing region. The MSHCP will allow Riverside County and its cities, including the City of Murrieta, to better control local land-use decisions and maintain a strong economic climate in the region while addressing the requirements of the state and federal endangered species acts (County of Riverside 2003).

The MSHCP serves as an HCP pursuant to Section 10(a)(1)(B) of FESA (16 U.S.C. 1531 et seq.), as well as a Natural Communities Conservation Plan (NCCP) under the Natural community Conservation Planning Act of 2001 (Fish and Game Code, Section 2800 et seq.). The MSHCP allows the participating jurisdictions to authorize "take" of plant and wildlife species identified within the plan area. The USFWS and CDFW have authority to regulate the take of threatened, endangered, and rare species. Under the MSHCP, the wildlife agencies have granted "take authorization" for otherwise lawful actions, such as public and private development that may incidentally take or harm individual species or their habitat outside of the MSHCP conservation area, in exchange for the assembly and management of a coordinated MSHCP conservation area.

The MSHCP is a "criteria-based plan" and does not rely on a hardline preserve map. Instead, within the MSHCP area, the MSHCP reserve will be assembled over time from a smaller subset of the Plan Area referred to as the Criteria Area. The Criteria Area consists of Criteria Cells (Cells) or Cell Groupings, and flexible guidelines (Criteria) for the assembly of conservation within the Cells or Cell Groupings. Cells and Cell Groupings also may be included within larger units known as Cores, Linkages, or Non-contiguous Habitat Blocks.

Western Riverside MSHCP Mitigation Fee

In order to implement to goals and objectives of the Western Riverside MSHCP and to mitigate the impacts caused by new development, lands supporting species covered by the MSHCP must be acquired and conserved. A development mitigation fee is necessary in order to supplement the financing of the acquisition of lands supporting species covered by the MSHCP and to pay for new development's fair share of this cost (County of Riverside 2003). The development mitigation fee assists in the maintenance of biological diversity and protects vegetation communities which are known to support threatened, endangered or sensitive populations of plant and wildlife species.

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3 METHODS

Data regarding biological resources present within the study area were obtained through a review of pertinent literature, field reconnaissance, habitat assessments, and focused surveys, which are described in detail below.

For purposes of this report, special-status resources are defined as follows:

> Special-status plant species include (1) species designated as either rare, threatened, or endangered by the CDFW or USFWS and are protected under either the California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.) or federal Endangered Species Act (FESA) (16 U.S.C. 1531 et seq.); (2) species that are candidate species being considered or proposed for listing under CESA or FESA; (3) species that are included on the CDFW Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2017) or species with a California Rare Plant Rank (CRPR) of 1 or 2 in the CNPS Inventory of Rare and Endangered Plants of California; and (4) Narrow Endemic Plant Species and Criteria Area Species as defined by the MSHCP.

> Special-status wildlife species include (1) species designated as either rare, threatened, or endangered by the CDFW or USFWS and are protected under either the California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.) or federal Endangered Species Act (FESA) (16 U.S.C. 1531 et seq.); (2) species that are candidate species being considered or proposed for listing under CESA or FESA; (3) species that are included on the CDFW Special Animals List (CDFW 2017); (4) species with additional survey requirements under the MSHCP.

> Special-status vegetation communities are those designated as sensitive by CDFW or those that provide habitat for special-status species.

3.1 Literature Review

Prior to field surveys, special-status biological resources present or potentially present within the project site were identified through queries of the CNDDB (CDFW 2017a), the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plant*s (CNPS 2017), MSHCP species occurrence data (County of Riverside 2003), and USFWS occurrence data (USFWS 2017). The CNPS Inventory was queried based on the USGS 7.5-minute quadrangle on which the project site is located (Romoland) and the eight surrounding quadrangles (Perris, Lakeview, Lake Elsinore, Wildomar, Steele Peak, Winchester, Murrieta, and Bachelor Mountain) (i.e., 9-quad search). The remaining databases were queried using geographic information systems (GIS) software based on a 10-mile buffer around the project site.

The following relevant studies were also reviewed:

- Biological Assessment: "Camp Ronald McDonald for Good Times" Garner Valley, Riverside County, California. (Thomas Olsen Associate, Inc. 1994)
- Biological Assessment: "Capital Improvement Project, Camp Ronald McDonald for Good Times, 56400 Apple Canyon Road, Idyllwild, CA 92549" (Callahan 2008)

General information regarding wildlife species distribution in the region and potential presence on the project site was primarily obtained from Garrett and Dunn (1981) for birds, Hall (1981) for mammals, Stebbins (2003) for reptiles and amphibians, and Emmel and Emmel (1973) for butterflies.

3.2 Field Survey

A general biological survey and vegetation mapping of the study area were conducted by Dudek biologists Ryan Henry and Karen Mullen on March 2, 2017. Habitat assessments for special-status species, a focused survey for narrow endemic plants, and a formal delineation of jurisdictional waters were also performed during the site visit. Table 1 summarizes the survey conditions.

Table 1
Schedule of Surveys

Date	Time	Staff	Environmental Conditions	Survey Type
03/02/2017	0830–1430	RH, KM	0–20% cloud cover; wind 5–15 miles per hour (mph); 49°–63° Fahrenheit (F)	Biological survey, vegetation mapping, habitat assessments, narrow endemic plant survey, jurisdictional delineation

Staff Key: RH: Ryan Henry; KM: Karen Mullen

3.2.1 Vegetation Communities and Land Covers

Vegetation communities and land covers were mapped in the field directly onto 100-scale (1 inch = 100 feet) topographic or aerial photographic base and later digitized into a GIS format using ArcGIS. Vegetation communities used in this report follow the MSHCP uncollapsed vegetation community classifications (County of Riverside 2003).

3.2.2 Plants

Plant species encountered during the botanical survey were identified and recorded. Common and scientific names for plant species with a California Rare Plant Rank (formerly CNPS List) follow the California Native Plant Society On-Line Inventory of Rare, Threatened, and Endangered Plants of California (CNPS 2017). For plant species without a California Rare Plant Rank, Latin names follow the Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California (Jepson Flora Project 2017) and common names follow the United States Department of Agriculture (USDA) Natural Resources Conservation Service Plants Database (USDA 2017).

3.2.2.1 Narrow Endemic Plants Habitat Assessment and Focused Survey

A habitat assessment and focused plant survey for Narrow Endemic Plant Species (NEPS) were conducted in accordance with the MSHCP requirements, which follow the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000) and the *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000). Surveys focused on the detection of Johnston's rock cress (*Boechera johnstonii*), San Jacinto (Munz's) mariposa lily (*Calochortus palmeri* var. *munzii*), and San Jacinto Mountains bedstraw (*Galium angustifolium* ssp. *jacinticum*).

Johnston's rock cress occurs in chaparral and pine forest at elevations of 4,429 to 7,054 feet above mean sea level (CNPS 2017; U.S. Fish and Wildlife Service 1995; U.S. Fish and Wildlife Service 1998). This perennial herb is endemic to the San Jacinto Mountains and often found on eroded clay soils. Johnston's rock cress blooms from February through June.

San Jacinto (Munz's) mariposa lily occurs in chaparral, lower montane coniferous forests (ponderosa pine [*Pinus ponderosa*] woodland), and meadows at elevations of 2,805 to 7,218 feet above mean sea level (CDFG 2000; CNPS 2017; Fielder and Ness 1993). This perennial bulbiferous herb is also endemic to the San Jacinto Mountains and often found on seasonally-moist, fine granitic loam on exposed knolls (in coniferous forests) and moist, sandy clay (in chaparral). San Jacinto mariposa lily blooms from May through July.

San Jacinto Mountains bedstraw occurs in partially shady, lower montane mixed forests and coniferous forests at elevations of 4,429 to 6,890 feet above mean sea level (CNPS 2017; Dempster and Stebbins 1971). This perennial herb is limited to the western side of the San Jacinto Mountains (County of Riverside 2003). San Jacinto Mountains bedstraw blooms from June through August.

The survey was conducted in accordance with MSHCP guidelines during the blooming season for the Johnston's rock cress (February–June). However, the survey was conducted outside the bloom period for the San Jacinto (Munz's) mariposa lily and San Jacinto Mountains bedstraw (May–July and June–August, respectively).

3.2.3 Wildlife

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other signs were recorded. Binoculars (10 x 50 power) were used to aid in the identification of observed wildlife throughout the project site. In addition to species actually detected, expected wildlife use of the site was determined by known habitat preferences of local species and knowledge of their relative distributions in the area.

Common and scientific names used for wildlife include: Crother (2008) for reptiles and amphibians, American Ornithologists' Union (AOU) (2012) for birds, Wilson and Reeder (2005) for mammals, North American Butterfly Association (NABA) (2001) or San Diego Natural History Museum (SDNHM) (2012) for butterflies, and Moyle (2002) for fish.

3.2.3.1 Amphibian Species Habitat Assessment

Focused habitat assessments for amphibian species were conducted in accordance with the MSHCP requirements, which identify the project site as occurring within an Amphibian Species Survey Area. The assessments focused on the analysis (and detection) of mountain yellow-legged frog habitat. According to Stebbins (1985), mountain yellow-legged frog habitat includes, but is not limited to, sunny riverbanks, meadow streams, isolated pools, lake borders, and rocky stream courses. Their habitat is typically restricted to natural streams and small pool associated with ponderosa pine, montane hardwood-conifer, and montane riparian habitat types (Zeiner, et al. 1988). Stagnant pools with floating algae or containing water greater than three feet deep appear to be avoided. Additionally, they appear to prefer open stream and lake margins that gently slope up to a depth of 5 to 8 centimeters with rocks or vegetation in close proximity (Jennings and Hayes 1994). Mountain yellow-legged frogs are seldom found more than 2 or 3 jumps from the water and require some form of nearby shelter (i.e., rocks, clumps of grass, banks, debris, etc.) (Stebbins 1985, Mullaly 1959). Another key distinguishing characteristic of pool and pond habitat is the lack of fishes (Bradford 1989; Bradford, et al. 1993).

Three areas were investigated for potential habitat within the study area: two intermittent drainages along the eastern portion (1.28 acre) and an isolated, manmade fire suppression pond within the center (0.69 acre). These areas were assessed by Dudek to determine the potential for the project site to support special-status amphibian species, and specifically the mountain yellow-legged frog. Biologists thoroughly investigated all potential habitat on foot during the survey. All aquatic wildlife species encountered during the survey were identified and recorded. Common and scientific names for species follow sources described above.

3.2.4 Jurisdictional Wetlands and Waters

A formal jurisdictional waters delineation was completed by Dudek on March 2, 2017. The jurisdictional waters delineation was conducted in accordance with the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the federal Clean Water Act (CWA) as "waters of the United States," including wetlands; CDFW pursuant to Section 1602 of the California Fish and Game Code; or the California Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the federal CWA and the Porter-Cologne Water Quality Act as "waters of the State."

Prior to visiting the study area, potential and/or historic drainages and aquatic features were investigated based on a review of the following: USGS topographic maps (1:24,000 scale), aerial photographs, the National Wetland Inventory (NWI) database, and the Natural Resource Conservation Service (NRCS) soil survey map (2017). Following the initial data collection, all areas that were identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, and CDFW were field verified and mapped.

The ACOE wetlands delineation was performed in accordance with the Corps Wetlands Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Environmental Laboratory 2008), A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008), and recent changes to 33 CFR, Part 328 provided by the USACE and EPA on the geographic extent of jurisdiction based on the U.S. Supreme Court's interpretation of the CWA. Non-wetland waters of the U.S. were delineated based on the limits of an OHWM. During the jurisdictional delineation, drainage features were examined for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to a traditional navigable water of the U.S. If any of these criteria were met, transects were run to determine the extent of each regulatory agencies' jurisdiction.

Transects were taken every 50 to 300 feet. Data on transect widths, dominant vegetation present within the drainage and in the adjacent uplands, and channel morphology were recorded on field forms. In areas where ACOE jurisdictional wetlands were suspected, data on vegetation, hydrology, and soils were collected along transects.

Areas regulated by the RWQCB are generally coincident with the ACOE, but include features isolated from navigable waters of the U.S. that have evidence of surface water inundation. The CDFW jurisdiction was defined to the bank of the stream/channels or to the limit of the adjacent riparian vegetation.

Drainage features were mapped during the field observation to obtain characteristic parameters and detailed descriptions using standard measurement tools. The location of transects, upstream and downstream extents of each feature, and sample points were collected in the field using a 1:2,400 scale (1 inch = 200 feet) aerial photograph, topographic base, and global positioning system (GPS) equipment with sub-meter accuracy. Dudek Geographic Information System (GIS) technician Andrew Greiss digitized the jurisdictional extents based on the GPS data and transect width measurements into a project-specific GIS using ArcGIS software.

4 PHYSICAL CHARACTERISTICS

4.1 Land Use

The project site has served as a children's camp since 1997. Over the years, additional improvements and buildings have been constructed to support the camp's visitors. The project site is currently characterized by developed land that includes numerous camp facilities such as a medical building, visitor lodges, a fire suppression pond, activity fields, horse pastures, and environmental education centers.

The surrounding area is characterized by a mix of recreational and agricultural land uses, and open space. The County of Riverside's 120-acre Hurkey Creek Park occurs just to the south and west of the project site, just north of State Route 74, and offers campsites, playgrounds, picnic areas, RV hook-ups, and hiking trails. Private land holdings that have historically been used for agriculture occur to the southeast. Open space occurs to the north and east of the project site.

4.2 Topography

The project site is located in the Garner Valley, which stretches from the San Jacinto Mountains to the north and Rouse Ridge-Thomas Mountain to the south. The Garner Valley is generally bounded by Keen Camp Summit to the northwest and the general intersection of State Route 371 and State Route 74 to the southwest. The project vicinity generally slopes to the south (see Figure 2); however, the project site is relatively flat with a gentle slope to the southeast. The elevation ranges from a high of 4,414 feet above mean sea level near the northwest corner to approximately 4,381 feet above mean sea level in the southeast corner.

4.3 Hydrology

The project site is located within the Hemet Lake Hydrologic Subarea of the larger San Jacinto Valley Hydrologic Unit. This watershed is composed of a group of connected drained by surface streams that generally flow west and southwest toward Lake Elsinore and eventually the Pacific Ocean. The San Jacinto River watershed encompasses approximately 732 square miles and drains to the Santa Ana River through Lake Elsinore and Temescal Wash. Major tributaries include Bautista Creek, Poppet Creek, Potrero Creek, Perris Valley Drain, and Salt Creek. Elevations in the watershed range from 10,804 feet at San Jacinto Peak to 1,382 feet at the Railroad Canyon Dam spillway.

The USGS topographic quadrangle and National Hydrography Dataset (NHD; USGS 2017) depict two streams in the vicinity of the project site. The primary drainage is an unnamed stream (referred to as Apple Canyon Creek in this report), which flows intermittently along Apple Canyon Road from the northeast and continues south before draining into Hemet Lake. Lake Hemet is located approximately 0.7 mile south of the project site. The other drainage depicted by the USGS and NHD originates north of the project site and merges with the primary drainage in the north-central portion of the project site.

Another hydrologic feature not included on the USGS topographic map or NHD dataset includes one fire suppression pond, which is located within the center of the project site. This feature serves as a recreational amenity and supports surface water year-round. The fire suppression pond is stock with fish and is well-maintained.

A review of the NWI dataset revealed three aquatic resources within the project site (USFWS 2017). These features correspond with Apple Canyon Creek and Drainage A in the center of the study area.

- **R4SBC (Riverine, intermittent, streambed, seasonally flooded)** – This type of wetland includes natural or artificial channels/streambeds that support flowing water periodically. Surface water is present for extended periods, but absent by the end of the growing season in most years. The water table typically occurs well below the soil surface. This resource was mapped in the southern portion of the project site associated with Apple Canyon Creek and in the northern portion of the project site associated with Drainage A. Within Apple Canyon Creek, this feature was mapped as discontinuous and occurred next to other wetland features associated with Apple Canyon Creek (PSSC).
- **PSSC (Palustrine, scrub-shrub, seasonally flooded)** – This type of wetland is characterized by nontidal systems dominated by woody vegetation less than 20 feet tall (tree shrubs, young trees (saplings), and tree or shrubs that are small or stunted because of environmental conditions). Surface water is present for extended periods especially early in the growing season, but absent by the end of the growing season in most years. This resource was mapped in the central portion of the project site and associated with a majority of Apple Canyon Creek.
- **PEM1C (Palustrine, emergent, persistent, seasonally flooded)** – This type of wetland is characterized by nontidal systems dominated by erect, rooted, herbaceous hydrophytes that are present for most of the growing season. Species normally remain standing at least until the beginning of the next growing season. Surface water is present for extended periods especially early in the growing season, but absent by the end of the growing season in most years. This resource was mapped in the southern-most portion of the study area and associated with Apple Canyon Creek south of Apple Canyon Road just off site.

4.4 Soils

According to U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (USDA NRCS 2017) the soils within the study area include the following: Wapi-Pacifico families and Oak Glen-Rush families. The majority of the project site (over 95%) is mapped as Oak glen-rush (Figure 5). The areas adjacent to the northwest are mapped as Wapi-Pacifico. Descriptions provided below are summarized from USDA NRCS (2017).

- **Oak Glen-Rush families complex, 2% to 15% slopes (OmD)** consists of well drained, moderately permeable and occur on gently sloping to steep uplands in areas of deeply weathered alluvium. Vegetation is primarily Coulter pine (*Pinus coulteri*) or ponderosa/Jeffrey pine (*Pinus jeffreyi*). The A and B horizons of this soil series are characterized by a dark, sandy loam that are neutral to slightly acidic.
- **Wapi-Pacifico families, dry-rock outcrop complex, 15% to 30% slopes (DxE)** consists of somewhat excessively drained soils that formed in material weathered from granitic rock. Vegetation is mainly ceanothus (*Ceanothus* sp.), manzanita (*Arctostaphylos* sp.), chamise (*Adenostoma* sp.), and interior live oak (*Quercus wislizeni*). The A and B horizons of this soil series are characterized by a grayish, brown loamy sand that are slightly or medium acidic. The rock outcrops typically contain less than 15% soil material capable of supporting vegetation.

The MSHCP has a list of sensitive soils that are known to be associated with listed and sensitive plant species in the region. These soils include clay soils and Traver-Domino-Willows association soils. None of the soils on site are designated as a sensitive soil by the MSHCP (County of Riverside 2003).

Soils within the study area were notably different most likely due to the debris flows that occurred following the 2013 Mountain Fire, which burned approximately 27,490 acres within the San Jacinto Mountains between San Jacinto Peak, on the north, and Garner Valley, on the south.

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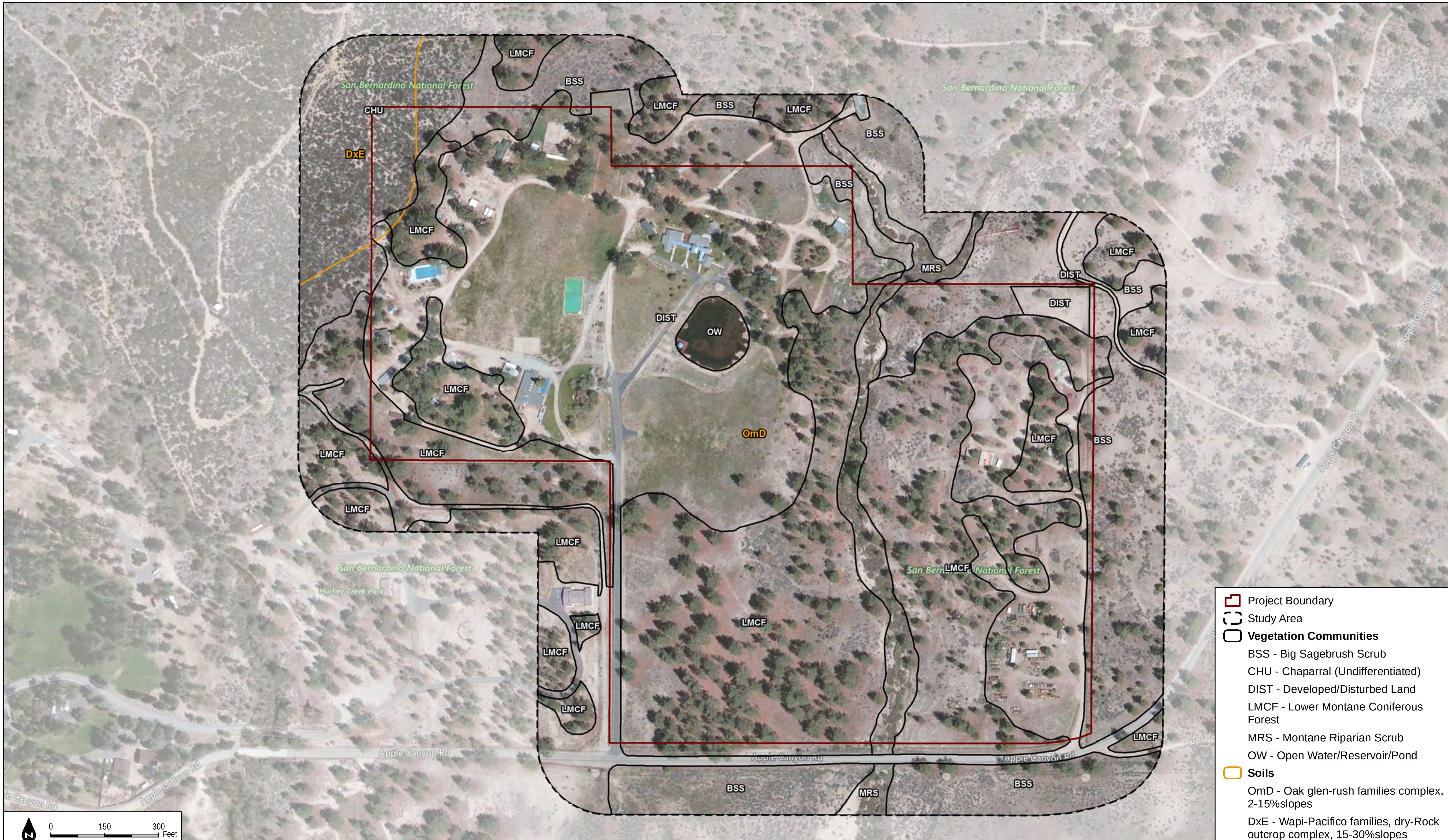

DUDEK

SOURCE: USDA/NRCS; Bing Maps, 2017

FIGURE 5

Vegetation Communities and Soils

Camp Ronald McDonald for Good Times Project

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5 RESULTS

The results of the surveys are discussed in the following order: vegetation communities and land covers (Section 5.1), general botanical and wildlife observations (Section 5.2), special-status biological resources (Section 5.3), and wildlife corridors/habitat linkages (Section 5.4). A list of wildlife and plant species observed on site is provided in Appendix A, and site photographs are provided in Appendix B. Additionally, an analysis of the project site's consistency with the MSHCP is discussed in Section 5.5 below.

5.1 Vegetation Communities and Land Covers

The study area is characterized by six vegetation communities and land covers: lower montane coniferous forest, chaparral (undifferentiated), big sagebrush scrub, montane riparian scrub, open water/reservoir/pond, and developed/disturbed land. These vegetation communities and land covers are illustrated on Figure 5 and described below.

5.1.1 Lower Montane Coniferous Forest

The lower montane coniferous forest vegetation community, as defined by the MSHCP, includes several subassociations based on elevation, slope aspect, and regional conditions. The account provided by Thorne (1976) identifies a community dominated by ponderosa pine (or Jeffrey pine) and may include Coulter pine, black oak (*Quercus kelloggii*), big-cone Douglas fir (*Pseudotsuga macrocarpa*), incense cedar (*Calocedrus decurrens*), canyon live oak (*Quercus chrysolepis*), and Pacific dogwood (*Cornus nuttallii*). Other species that occur within the understory of this community include manzanitas, deer brush (*Ceanothus integerrimus*), yerba santa (*Eriodictyon trichocalyx*), chinquapin (*Chrysolepis sempervirens*), thimbleberry (*Rubus parviflorus*), silk tassel bush (*Garrya flavescens*), lupine (*Lupinus excubitus, Lupinus formosus*), cherry (*Prunus* sp.), California coffeeberry (*Rhamnus californica*), Sierra gooseberry (*Ribes roezlii*) and nightshade (*Solanum xanti*)(County of Riverside 2003). The herbaceous layer may include morning-glory (*Calystegia occidentalis* ssp. *fulcrata*), sedge (*Carex multicaulis*), clarkia (*Clarkia rhomboidea*), bird's-beak (*Cordylanthus rigidus*), eriastrum (*Eriastrum densifolium*), splendid gilia (*Gilia splenden*), phacelia (*Phacelia imbricata*), California brome (*Bromus carinatus* var. *carinatus*), melic (*Melica imperfecta*), and bluegrass (*Poa scabrella*) (County of Riverside 2003).

Lower montane coniferous forest occurs in several areas throughout the study area and often intergrades with the develop/disturbed land cover described below. The community is dominated by ponderosa pine and often occurs with an understory of big sagebrush. Other species include

California juniper (*Juniperus californica*), eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *polifolium*), pinbush, and wedge leaf ceanothus.

5.1.2 Chaparral (Undifferentiated)

Undifferentiated chaparral, or mixed chaparral, as defined by the MSHCP, includes chaparral communities with the largest elevational gradient and highest variation in species composition within the plan area. At higher elevations, this chaparral community transitions with coniferous forests to support Eastwood's manzanita (*Arctostaphylos glandulosa*), bigberry manzanita (*Arctostaphylos glauca*), pink-bract manzanita (*Arctostaphylos pringlei* ssp. *drupacea*), chaparral whitethorn (*Ceanothus leucodermis*), deer brush (*Ceanothus integerrimus*), Veatch's silk-tassel (*Garrya veatchii*), Jeffrey pine, ponderosa pine, Coulter pine, black oak, canyon live oak, and interior live oak (*Quercus wislizenii*) (County of Riverside 2003). The understory typically includes Bigelow's spike-moss (*Selaginella bigelovii*), bedstraw (*Galium* sp.), bird's-beak (*Cordylanthus* sp.), wallflower (*Erysimum capitatum*), yarrow (*Achillea millefolium*), rock cress (*Arabis perennans*), whiskerbrush (*Linanthus ciliatus*), claytonia (*Claytonia parviflora*), and Indian paintbrush (*Castilleja* sp.) (County of Riverside 2003).

Undifferentiated chaparral occurs in the northwestern corner of the study area just beyond the camp. The community is dominated by Eastwood's manzanita, bigberry manzanita, chamise (*Adenostoma fasciculatum*), big sagebrush, pinebush (*Ericameria pinifolia*), and wedge leaf ceanothus (*Ceanothus cuneatus*). Other species included Eastwood's goldenbush (*Ericameria fasciculata*), birch leaf mountain mahogany (*Cercocarpus betuloides*), scrub oak (*Quercus dumosa*), cholla (*Cylindropuntia californica*), and creeping snowberry (*Symphoricarpos mollis*).

5.1.3 Big Sagebrush Scrub

The big sagebrush scrub vegetation community, as defined by the MSHCP, includes big sagebrush (*Artemisia tridentata*) as pure stands or the dominant shrub within a mixed shrub community. Other species that occur within this community include bitterbrush (*Purshia tridentata*), rubber rabbit-bush (*Chrysothamus nauseosus*), yellow rabbitbrush (*Chrysothamus viscidiflorus*) black bush (*Coleogyne ramosissima*), Mormon-tea (*Ephedra viridis*), horsebrush (*Tetradymia canescens*), plateau gooseberry (*Ribes velutinum*) and hopsage (*Grayia spinosa*)(County of Riverside 2003). The understory is dominated by a herbaceous cover of perennial bunch grasses such as ricegrass (*Achnatherum hymenoides*), needle-and-thread (*Stipa comata*), letterman's needlegrass (*S. lettermanii*), needlegrass (*S. occidentalis*), needlegrass (*S.*

thurberiana), desert needlegrass (*S. speciosa*), one-sided bluegrass (*Poa secunda*), bluebunch wheatgrass (*Elymus spicata*), and ashy ryegrass (*Elymus cinereus*) (County of Riverside 2003).

Big sagebrush scrub occurs in several areas around the perimeter of the study area. The community is dominated by big sagebrush and often occurs with an open overstory of ponderosa pine. Other dominant species include redstem stork's bill, manzanita, needlegrass, bluebunch wheatgrass, ashy ryegrass, and spiny sowthistle (*Sonchus asper*).

5.1.4 Montane Riparian Scrub

Montane riparian scrub is a dense, broad-leafed, winter-deciduous riparian thicket dominated by several species of willow (*Salix* sp.), dogwood (*Cornus* sp.), and/or alders (*Alnus* sp.) with Jeffrey pine and incense cedar often occurring along the edges of the vegetation community (County of Riverside 2003). This habitat is considered seral due to repeated disturbance/flooding and is, therefore, unable to develop into the more mature montane riparian forest.

There are two areas within the study area that are mapped as montane riparian scrub: Apple Canyon Creek and Drainage A. These features enter the project site from the north and merge approximately 620 feet from the northern study area boundary and support a contiguous montane riparian scrub vegetation community. The community is dominated by arroyo willow (*Salix lasiolepis*), white alder (*Alnus rhombifolia*), mulefat (*Baccharis salicifolia*), and willow baccharis (*Baccharis salicina)*. Due to the high flows from recent winter rains the understory of this community was limited to red stem stork's bill (*Erodium cicutarium*), stinging nettle (*Urtica dioica*), and other non-native grasses.

5.1.5 Open Water/Reservoir/Pond

The open water/reservoir/pond land cover is typically a closed-contour depression, often manmade, that supports little to no vegetation due to a lack of light penetration. The fire suppression pond located within the center of the project site supports open water land cover.

5.1.6 Developed/Disturbed Land

Developed/disturbed land refers to areas that support permanent structures and building, lack vegetation, and/or generally are the result of severe or repeated mechanical perturbation that limits native vegetation establishment and growth. The majority of the project site is developed/disturbed land. There are portions of the land cover where no vegetation occurs, because the area is frequently disturbed, disced, or maintained as access trails and roads. Some areas support ornamental tree species that have been planted and receive frequent or periodic maintenance. The remaining areas support annual, weedy species that serve as a lawn for the camp, including, but not limited to, annual bluegrass (*Poa annua*), Bermuda grass, Mexican rush (*Juncus mexicanus*), saltgrass (*Distichlis spicata*), redstem stork's bill, cheatgrass, annual yellow sweetclover (*Melilotus indicus*), and cudweed (*Pseudognaphalium* sp.).

5.2 Plants and Wildlife Observed

5.2.1 Plants

The majority of the project site has been planted with ornamental species and frequently maintained. The developed/disturbed land cover supports a lawn that experiences routine mowing throughout the center of the project site. However the area surrounding the camp supports a high diversity and richness of plants. A total of 47 vascular plant species, consisting of 34 native species (72%) and 13 non-native species (28%), were recorded within the study area during the survey. A full list of plant species observed is provided in Appendix A.

5.2.2 Wildlife

The project site supports limited habitat diversity, since it is primarily characterized by developed/disturbed land cover. Consequently, the wildlife diversity and richness on the project site is also limited. However the area surrounding the camp supports a high diversity of wildlife.

A total of 26 wildlife species, consisting of 22 native species (85%) and 4 non-native species (15%), were recorded within the study area during the survey. A full list of wildlife species by taxonomic group observed in the project site is provided here, as well as in Appendix A.

Birds

The avian species observed during the survey are very common in the habitats present within the study area. Some of the common bird species detected within the study area included: acorn woodpecker (*Melanerpes formicivorus*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), Brewer's blackbird (*Euphagus cyanocephalus*), bushtit (*Psaltriparus minimus*), California scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), dark-eyed junco (*Junco hyemalis*), house finch (*Haemorhous mexicanus*), mallard (*Anas platyrhynchos*), spotted towhee (*Pipilo maculatus*), and white-crowned sparrow (*Zonotrichia leucophrys*).

Reptiles and Amphibians

One reptile (western fence lizard [*Sceloporus occidentalis*]) and one amphibian (Baja California treefrog [*Pseudacris hypochondriaca*]) were detected within the study area during the survey.

Invertebrates

No invertebrates were detected within the study area during the survey.

Fish

Three fish species are known to occur within the project site: bullhead catfish (*Ameiurus* sp.), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*).

Mammals

Four mammal species were detected within the project site during the survey: cottontail rabbit (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus [Otospermophilus] beecheyi*), domestic dog (*Canis lupus familiaris*), and raccoon (*Procyon lotor*).

5.3 Special-Status Biological Resources

Appendix C provides a table of all special-status species whose geographic ranges fall within the general project site vicinity. Species potentially occurring based on habitat relationships are identified as having moderate or high potential to occur based on habitat conditions, and species for which there is little or no suitable habitat are identified as not expected to occur or having low potential to occur.

5.3.1 Special-Status Plants

A total of 79 special-status plant species were reported in the CNDDB, CNPS, and USFWS databases as occurring in the vicinity of the study area. Appendix C, Table C-1 summarizes the special-status plant species that were included in these databases and evaluated as part of this assessment. For each species evaluated, a determination was made regarding the potential for the species to occur on site based on information gathered during the field reconnaissance, including the location of the site, habitats present, current site conditions, and past and present land use.

No federally- or state-listed plant species or other special-status plant species were detected during survey.

There are several special-status plant species that are documented in the region that were determined to have no or low potential to occur within the project site based on an evaluation of elevation and vegetation communities known to occur within the project site. Of the 79 special-status plant species listed in the CNDDB, CNPS, and USFWS databases as occurring in the vicinity of the study area, 57 are not expected to occur within the project site and 16 were determined to have a low potential to occur within the project site. A total of 6 special-status plant species have at least a moderate potential to occur within the project site: California beardtongue (*Penstemon californicus*; CRPR 1B.2), chickweed oxytheca (*Sidotheca caryophylloides*; CRPR 4.3), Hall's Monardella (*Monardella macrantha* ssp. *hallii*; CRPR 1B.3), lemon lily (*Lilium parryi*; CRPR 1B.2), San Bernardino aster (*Symphyotrichum defoliatum*; CRPR 1B.2), and San Bernardino Mountains owl's-clover (*Castilleja lasiorhyncha*; CRPR 1B.2).

5.3.2 Special-Status Wildlife

A total of 54 special-status wildlife species were reported in the CNDDB and USFWS databases as occurring in the vicinity of the study area. Appendix C, Table C-2 summarizes the special-status wildlife species that were included in these databases and evaluated as part of this assessment. For each species evaluated, a determination was made regarding the potential for the species to occur on site based on information gathered during the field reconnaissance, including the location of the site, habitats present, current site conditions, and past and present land use.

No federally- or state-listed wildlife species or other special-status wildlife species were detected during the survey.

There are several special-status wildlife species that are documented in the region that were determined to have no or low potential to occur within the project site based on an evaluation of elevation and vegetation communities known to occur within the project site. Of the 54 special-status wildlife species listed in the CNDDB and USFWS databases as occurring in the vicinity of the study area, 18 are not expected to occur within the project site and 7 were determined to have a low potential to occur within the project site. A total of 10 special-status wildlife species have at least a moderate potential to occur within the project site: bald eagle (*Haliaeetus leucocephalus*; State Endangered/Fully Protected), California mountain kingsnake (San Bernardino population)(*Lampropeltis zonata* (*parvirubra*; Watch List), large-blotched salamander (*Ensatina klauberi*; Watch List), purple martin (*Progne subis*; California Species of Special Concern), San Bernardino flying squirrel (*Glaucomys sabrinus californicus*;

California Species of Special Concern), San Diegan tiger whiptail (*Aspidoscelis tigris stejnegeri*; California Species of Special Concern), southern rubber boa (*Charina umbratica*; State Threatened), Townsend's big-eared bat (*Corynorhinus townsendii*; California Species of Special Concern), tricolored blackbird (*Agelaius tricolor*; California Species of Special Concern), and Yuma Myotis (*Myotis yumanensis*; California Species of Special Concern).

5.3.3 Jurisdictional Wetlands and Waters

Three features were identified as potentially jurisdictional waters due to topography, presence of riparian vegetation, and local hydrology: two drainage features that bisect the project site and one fire suppression pond located in the center of the project site. Figure 6 illustrates the location and extent of jurisdiction within the study area, and Table 2 summarizes the amount of jurisdiction calculated within the study area.

The two drainages were determined to support 1.97 acres of non-wetland jurisdictional waters of the United States and waters of the State, as regulated by the ACOE, RWQCB, and CDFW. The pond was determined to support a 0.69 acre isolated, non-natural water body not subject to the jurisdiction of the ACOE, RWQCB, or CDFW. There are no federal jurisdictional wetlands, as regulated by the ACOE under CWA, within the project site.

Table 2
Summary of Jurisdictional Features

Feature	Length (feet)	Width (feet)		Area (acre)		Nature
		USACE / RWQCB	*CDFW*	*USACE / RWQCB*	*CDFW*	
Apple Canyon Creek	1,848	9	12-60	0.51	1.93	Intermittent
Drainage A	620	3	30-40	0.04	0.52	Intermittent
Fire Suppression Pond	-	-	-	-	-	Perennial
Total	**2,468**			**0.55**	**2.45**	

The following description is a detailed account of the jurisdictional features investigated within the study area. The features are described from their upstream to downstream extent. The wetland indicator status was assigned to each species using the National Wetland Plant List (California) (Lichvar et al. 2014), as shown in Table 3. The wetland indicator status of each plant species observed within the OHWM is provided for easy reference.

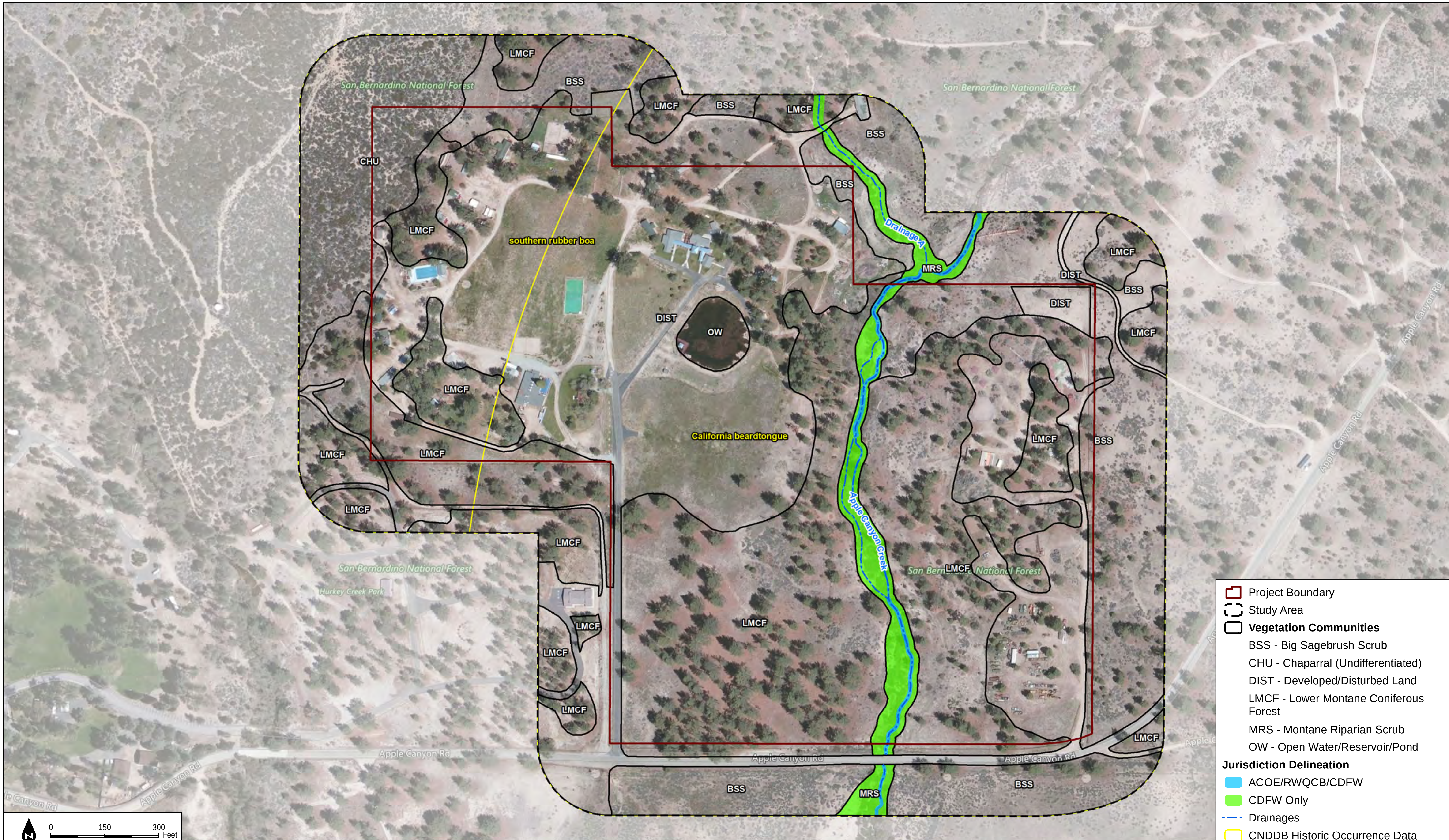
Table 3
Summary of Wetland Indicator Status

Category	Probability
Obligate Wetland (OBL)	Almost always occur in wetlands (estimated probability of >99%)
Facultative Wetland (FACW)	Usually occur in wetlands (estimated probability of 67% to 99%)
Facultative (FAC)	Equally likely to occur in wetlands/non-wetlands (estimated probability of 34% to 66%)
Facultative Upland (FACU)	Usually occur in non-wetlands (estimated probability 67% to 99%)
Obligate Upland (UPL)	Almost always occur in non-wetlands (estimated probability >99%)
No Indicator (NI)	Species not listed with a wetland indicator status

Apple Canyon Creek

Apple Canyon Creek appears to originate to the north of the study area near Antsell Rock, parallels Apple Canyon Road, traverses the study area for approximately 1,848 linear feet (0.35 mile), and exits the study area through two, 48-inch corrugated metal pipe culverts underneath Apple Canyon Road along the southern boundary. Apple Canyon Creek is an intermittent stream supported by seasonal storm flows from upstream areas. Downstream, the creek eventually merges with other streams that enter Hemet Lake (TNW) located approximately 6,178 feet (1.2 miles) southwest of the project site.

Apple Canyon Creek is characterized by an earthen streambed with a gentle trapezoidal structure. A majority of the on-site drainage was braided and formed two distinct channels with a continuous OHWM that ranged from 3 to 12 feet in width. The CDFW jurisdictional width encompassed the lateral extent of the montane riparian scrub vegetation community within the study area and ranged from 17 to 50 feet in width. The average ACOE width was 9 feet and the CDFW average width was 25 feet.



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SOURCE: CDFW 2017; Bing Maps, 2017

FIGURE 6

Biological Resources and Jurisdictional Areas

Camp Ronald McDonald for Good Times Project

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Surface water was present and flowing within Apple Canyon Creek at the time of the investigation due to the recent heavy winter rains. Although much of the vegetation within the drainage was absent due to the high flows from recent winter rains, dominant species within the drainage included Bermuda grass (*Cynodon dactylon*; FACU), redstem stork's bill (*Erodium cicutarium*; NI), and stinging nettle (*Urtica dioica*; FAC). The overstory was dominated by arroyo willow (*Salix lasiolepis*; FAC), white alder (*Alnus rhombifolia*; FACW), and ponderosa pine (*Pinus ponderosa*; FACU). Other species included mulefat (*Baccharis salicifolia*; FAC), common monkey flower (*Mimulus guttatus*; OBL), plantain (*Plantago* sp.; FAC), and wild mustard (*Brassica nigra*; UPL). Species within the adjacent uplands included big sagebrush (*Artemisia tridentata*), Bermuda grass, annual bluegrass (*Poa annua*), red brome (*Bromus madritensis*), and soft brome (*Bromus hordeaceus*). Two data stations were established along Apple Canyon Creek, one within a potential adjacent wetland to the OHWM and one outside the zone dominated by hydrophytic vegetation (lower montane coniferous forest) (Appendix D). Soil pits were excavated at each data station to confirm the presence of hydric soils within potentially adjacent wetland and upland areas. Both soil pits revealed the same profile, which lacked hydric soil indicators but showed evidence of historic debris flows within the top 5 inches from the 2013 Mountain Fire. As a result, Apple Canyon Creek does not contain jurisdictional wetlands.

Drainage A (Tributary)

Drainage A appears to originate to the north of the study area, traverses the study area for approximately 620 linear feet (0.12 mile), and merges with Apple Canyon Creek near the northern project site boundary. The tributary is an intermittent stream supported by seasonal storm flows from upstream areas.

Drainage A is characterized by an earthen streambed with a gentle trapezoidal structure. The channel supported a discontinuous OHWM (interrupted by a dirt access road/trail) that measured approximately 3 feet in width. The CDFW jurisdictional width encompassed the lateral extent of the montane riparian scrub vegetation community within the study area that measured approximately 30 feet in width.

Surface water was present and flowing within Drainage A at the time of the investigation due to the recent heavy winter rains. Vegetation within the drainage was absent due to the high flows from recent winter rains. Dominant species identified on the adjacent drainage terrace included Bermuda grass and redstem stork's bill. The overstory was dominated by arroyo willow. Other species included mulefat, plantain, and wild mustard. Species within the adjacent uplands included big sagebrush, Bermuda grass, annual bluegrass, red brome, and soft brome. One data station was established along Drainage A (Appendix D). A soil pit was excavated immediately adjacent to the OHWM on a defined, narrow terrace due to the presence of a dominance of hydrophytic vegetation. The soil pit lacked hydric soil indicators but showed evidence of historic debris flows within the top 7 inches from the 2013 Mountain Fire. As a result, Drainage A does not contain jurisdictional wetlands.

Fire Suppression Pond

An approximately 0.69-acre manmade pond occurs within the center of the project site. Constructed in 1997, the perennial pond serves multiple purposes for the camp including a source of water for fire suppression, and a recreational and fishing destination. Access to the pond is available from all sides, and a wooden boardwalk and gazebo are located along the western bank. The pond is stocked with catfish, carp, and mosquito fish to control aquatic plants and nuisance wildlife. The fire suppression pond supports a 2- to 3-foot wide vegetated perimeter that is frequently maintained and included broadleaf cattail (*Typha latifolia*) surrounded by a few planted cottonwood (*Populus fremontii*) trees.

The fire suppression pond is considered an isolated, non-natural feature that would not be subject to ACOE, RWQCB, or CDFW jurisdiction.

5.4 Wildlife Corridors/Habitat Linkages

The project site is surrounded by a mix of recreational, agricultural, and open space areas. The project site is bounded to the south by State Route 74. Although this road may present some restrictions, movement of medium and large wildlife through the region is not limited.

The project site is located within Existing Core K, as designated in the MSHCP. Existing Core K includes the San Bernardino National Forest and the Potrero Area of Critical Environmental Concern. According to the MSHCP, this core area provides nesting, breeding, foraging, and live-in habitat for a number of species, and supports several Narrow Endemic Plant Species (County of Riverside 2003):

> "Planning Species for which habitat is provided within this Core include peninsular spine flower, San Bernardino kangaroo rat, slender-horned spine flower, graceful tarplant, mountain lion, California spotted owl, granite spiny lizard, Johnston's rock cress, western pond turtle and Stephens' kangaroo rat. Maintenance of habitat quality and maintenance of existing large intact habitat blocks are important for these species. This Core likely provides for Live-In

> Habitat for common mammals, including bobcat, and larger mammals such as mountain lion moving through the Core Area to other Core Areas in Wilson Valley and Cactus Valley."

This Core is contiguous with Proposed Core 3, Proposed Core 4, Proposed Core 5, and Proposed Core 7 and connects to the eastern portions of Riverside County.

The areas targeted for conservation include the project site. However, due to the limited construction and function of the property as a nature camp following project implementation, the proposed project is not anticipated to significantly affect wildlife movement within the conservation area.

5.5 MSHCP Consistency Analysis

This section addresses the consistency of the proposed project with the requirements of the MSHCP. The project site is located within the REMAP Area Plan, which has portions of 10 conservation areas: Existing Core K, Proposed Core 4, Proposed Core 5, Proposed Core 6, Proposed Core 7, Proposed Linkage 11, Proposed Linkage 13, Proposed Linkage 14, Proposed Linkage 15, and Proposed Linkage 16. The project site is within Existing Core K, but does not overlap any criteria cells.

Chapter 6 of the MSHCP outlines additional implementation measures with which permittees must comply. The relevant section of the MSHCP, requirements, and proposed project's consistency with the requirement are outlined below.

- MSHCP Section 6.1.2, Riparian/Riverine and Vernal Pools Guidelines: Compliance is discussed in Section 5.5.1 of this report.
- MSHCP Section 6.1.3, Narrow Endemic Plant Species: The project site is within a Narrow Endemic Plant Species Survey Area. Compliance is discussed in Section 5.5.2 of this report.
- MSHCP Section 6.1.4, Urban Wildlands/Interface Guidelines: Compliance is discussed in Section 5.5.3 of this report.
- MSHCP Section 6.3.2, Additional Survey Requirements: This section of the MSHCP outlines survey requirements for criteria area plant species, burrowing owl, mammals, and amphibians. The project site is within the amphibian survey area. Compliance is discussed in Section 5.5.4 of this report.

5.5.1 Riparian/Riverine and Vernal Pool Habitat

The MSHCP defines riparian/riverine areas as "lands which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year." In addition, riverine areas (streams) include areas that "do not contain riparian vegetation, but that have water flow for all or a portion of the year, and contain biological functions and values that contribute to downstream habitat values for covered species inside the MSHCP Conservation Area."

Riparian/Riverine Habitat

Two areas supporting montane riparian scrub habitat occur within the project site: Apple Canyon Creek and Drainage A (a tributary to Apple Canyon Creek). These areas were investigated by Dudek in March 2017 to determine if they met the MSHCP's definition of riparian/riverine habitats.

The montane riparian scrub associated with Apple Canyon Creek and Drainage A totals approximately 2.75 acres. This community supports young, emergent trees and seasonally available surface water, providing a structure more favorable for riparian wildlife species. This area meets the definition for riparian habitat as defined by the MSHCP. The focused habitat assessment conducted for riparian-dependent species concluded that the drainage supports potential habitat for riparian wildlife species; however, is not likely to support mountain yellow-legged frog or other planning species within Core K. Although this area meets the definition for riparian habitat, it does not provide habitat to support riparian species covered by the MSHCP.

The project would avoid impacts to this community and therefore no additional steps are required under the MSHCP.

Vernal Pools and Fairy Shrimp Habitat

There are no soils associated with vernal pools within the project site, including clay soils or soils of the Willows/Travers/Domino series. No stock ponds, ephemeral pools, or other similar features that would provide potential habitat were observed during biological surveys within the project site.

The fire suppression pond located in the center of the project site supports surface water throughout the year and therefore would not support vernal pool species that are dependent on the alternation of seasonal drying and ponding. Outside of the pond, a few areas that had been previously graded and/or disturbed showed signs of inundation as a result of recent rainfall but showed no indicators of prolonged ponding that would support vernal pools and fairy shrimp habitat.

Based on the soils present and the history of the site, the project site does not support vernal pools or fairy shrimp habitat.

5.5.2 Narrow Endemic Plant Species

The project site is within the survey area for three narrow endemic plant species: Johnston's rock cress, San Jacinto (Munz's) mariposa lily, and San Jacinto Mountains bedstraw. Of these species, the Johnston's rock cress and San Jacinto Mountains bedstraw are not expected to occur since the project site is outside of the species' known elevation range. The San Jacinto (Munz's) mariposa lily was determined to have a low potential to occur on the project site. Potential chaparral and coniferous forest habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat. Further, during the focused survey for NEPS, this perennial herb was not detected. As a result, NEPS have little to no potential to occur within the project site, and no additional actions are required.

5.5.3 Urban/Wildlands Interface Guidelines

As discussed above, the project site is within Existing Core K, but does not overlap any criteria cells. Development within or in proximity to MSHCP Conservation Areas requires compliance with the MSHCP Section 6.1.4 Urban/Wildlands Interface Guidelines to address potential indirect effects. Standard construction BMPs and construction-related minimization measures to control dust, erosion, and runoff, including, but not limited to, straw bales and silt fencing, will be implemented during the proposed project improvements to minimize these effects. Specific elements addressed in the proposed project design include:

- **Drainage**. The project would not adversely alter the quantity or quality of runoff discharged to the MSHCP Conservation Area. Several ponds have been incorporated within the design to capture surface runoff (north of pond village, south of pond village, and south of Dining Hall delivery and parking area).
- **Toxics**. There would be no change to the handling and use of toxic chemicals (such as pesticides and fertilizers) currently used on the project site. As a result, no toxic discharges that would adversely affect the MSHCP Conservation Area are anticipated.
- **Lighting**. There would be no change to the use or type of night lighting currently used on the project site. As a result, no adverse lighting effects to the MSHCP Conservation Area are anticipated.

- **Noise**. Noise levels during and after construction will not exceed residential noise standards. The proposed improvements will complement the project design and not result in adverse noise effects to the MSHCP Conservation Area.
- **Invasives**. There would be no change to the use or type of landscaping currently used on the project site. Use of non-native, invasive plant species would be avoided. As a result, no adverse invasive effects to the MSHCP Conservation Area are anticipated.
- **Barriers**. There would be no change to the use or type of fencing currently used on the project site. As a result, no adverse barrier effects to the MSHCP Conservation Area are anticipated.
- **Grading and Land Development**. Land clearing and minor grading is anticipated to implement the proposed project improvements. However, standard construction BMPs and construction-related minimization measures will be implemented to minimize potential dust, erosion, and runoff effects. Additionally, no manufactured slopes within the MSHCP Conservation Area are proposed as part of the project design. As a result, no adverse grading effects to the MSHCP Conservation Area are anticipated.

The proposed project would not result in long-term adverse edge effects that may affect biological resources within areas proposed for conservation. The project would not facilitate unauthorized public access, domestic animal predation, illegal trespass, or dumping into the MSHCP Conservation Areas. Therefore, the proposed project is consistent with the MSHCP Urban/Wildlands Interface Guidelines.

5.5.4 Additional Survey Requirements

The project site is within the survey area for one amphibian species: mountain yellow-legged frog. The mountain yellow-legged frog is not expected to occur on the project site due to the lack of suitable habitat. Apple Canyon Creek and Drainage A are intermittent streams that do not support the relatively permanent, open stream systems characterized by gently sloping banks with rocks and vegetation for shelter. Additionally, these intermittent drainages have been known to seasonally support fish species. Similarly, the fire suppression pond would not be considered suitable habitat since it contains fish species year-round. As a result, special-status amphibian species are not expected to occur within the project site, and no additional actions are required.

The project site is not located within any other additional focused survey areas according to the MSHCP.

6 PROJECT IMPACTS

This section addresses direct, indirect, and cumulative impacts to biological resources that would result from implementation of the proposed project.

Direct impacts refer to 100% loss of a biological resource. For purposes of this report, it refers to the area where vegetation clearing, grubbing, or grading replaces biological resources. Direct impacts were quantified by overlaying the proposed impact limits on the biological resources map of the project site. Direct impacts would occur from development of the site.

Indirect impacts are reasonably foreseeable effects caused by project implementation on remaining or adjacent biological resources outside the direct construction disturbance zone. Indirect impacts may affect areas within the project site but outside the construction disturbance zone, including open space and areas outside the project site. Indirect impacts may be short term and construction-related or long term in nature and associated with development in proximity to biological resources. Short-term indirect impacts could include: dust, which could disrupt plant vitality in the short term; construction-related soil erosion and water runoff; and construction-related vibration and noise and lighting, which could disturb wildlife species. Long-term indirect impacts could include invasion by exotic plants and domestic pets, lighting, noise, traffic collisions, exposure to urban pollutants (e.g., fertilizers, pesticides, herbicides, and other hazardous materials), soil erosion, and hydrologic changes (e.g., surface and groundwater level and quality).

Cumulative impacts refer to the combined environmental effects of the proposed project and other relevant projects.

6.1 Impacts to Vegetation Communities and Land Covers

6.1.1 Direct Impacts

Construction of the proposed project would result in direct permanent and temporary impacts to disturbed land covers and common vegetation communities, as presented in Table 4 and shown on Figure 7.

Table 4
Permanent and Temporary Impacts to Vegetation Communities

Vegetation Community/Land Cover	Permanent Impact (acres)	Temporary Impact (acre)
Lower Montane Coniferous Forest	1.38	2.19
Chaparral (undifferentiated)	<0.01	0.02
Big Sagebrush Scrub	0.00	0.01
Developed/Disturbed Land	3.53	4.54
Open Water/Reservoir/Pond	0.00	0.00
Montane Riparian Scrub*	0.00	0.00

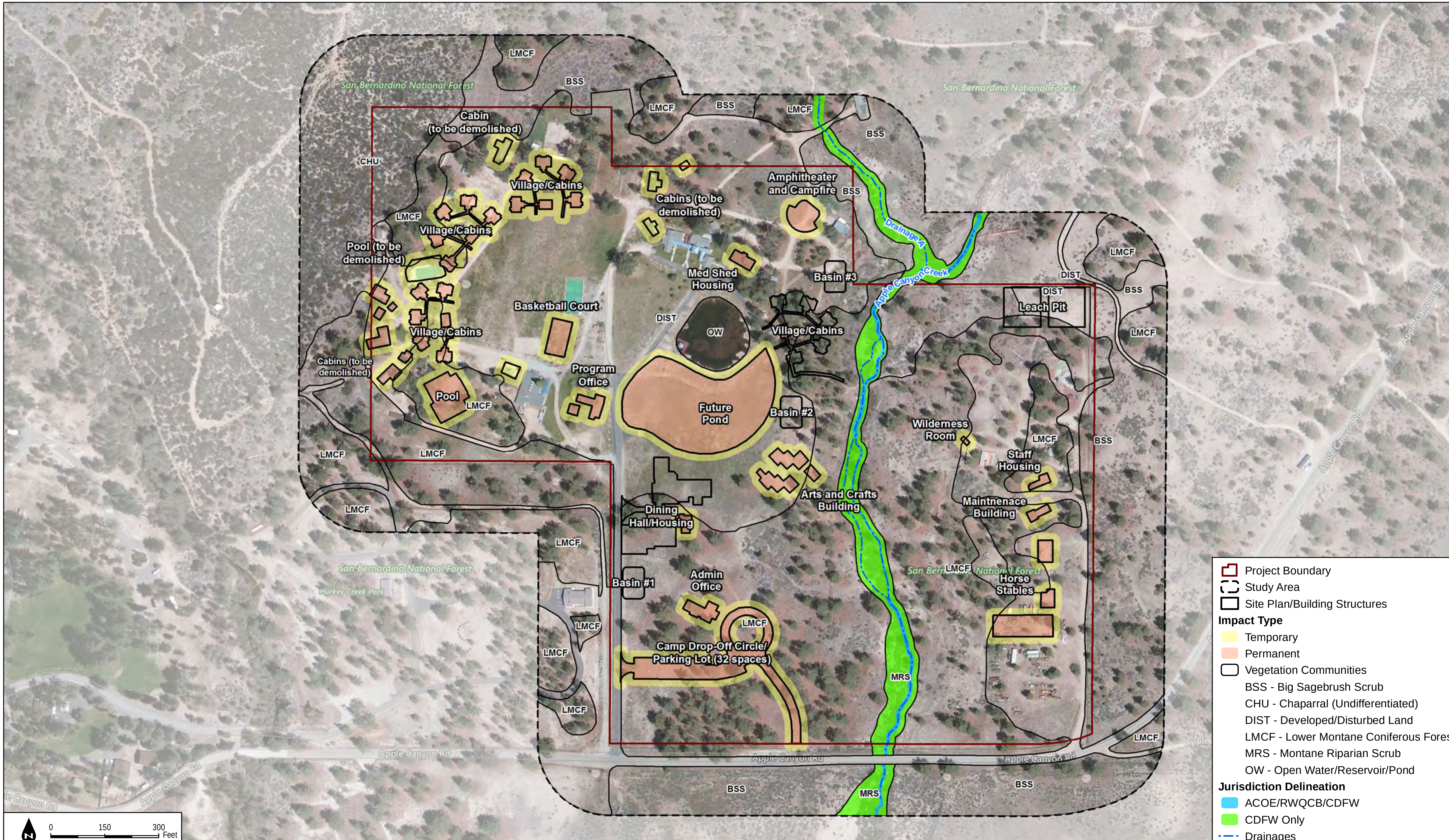
* Vegetation communities considered special-status by CDFG (2010).

The proposed project has been designed to avoid the natural vegetation communities present within the study area, including the open water and montane riparian scrub. However, a small area of chaparral would be affected by project implementation. Direct, permanent impacts that total less than 0.01 acre would occur to this vegetation community.

Project improvements would be constructed under a 1.38-acre portion of the lower montane coniferous forest in the western portion of the project site; however, it is assumed that impacts would occur under the tree canopy, and only ground cover would be removed for new facilities. Ground cover in this area is primarily non-native grass and forb species and does not constitute removal of habitat.

6.1.2 Indirect Impacts

During construction activities, indirect edge effects may include dust, which could disrupt plant vitality in the short term, or construction-related soil erosion and water runoff. In the absence of best management practices (BMPs), construction-related minimization measures to control dust, erosion, and runoff, and compliance with National Pollutant Discharge Elimination System (NPDES) requirements, indirect impacts to on-site aquatic resources (open water and montane riparian scrub) and off-site upland resources (lower montane coniferous forest, big sagebrush scrub, and chaparral) could occur. However, it is assumed that standard construction BMPs and construction-related minimization measures to control erosion and runoff, including, but not limited to, straw bales and silt fencing, will be implemented to minimize these adverse effects.



DUDEK

SOURCE: Bing Maps, 2017

FIGURE 7

Biological Resources and Jurisdictional Areas Impacts

Camp Ronald McDonald for Good Times Project

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6.2 Impacts to Special-Status Plants

6.2.1 Direct Impacts

No special-status plant species were identified on site during the focused survey, and no special-status plant species have a moderate or high potential to occur. Therefore, implementation of the project would not result in direct impacts to special-status plants.

6.2.2 Indirect Impacts

Construction-related dust, soil erosion, and water runoff can affect any potentially occurring special-status plant species that may occur on site. However, no special-status plant species are expected to occur on site; therefore, no significant indirect short-term or long-term impacts to special-status plant species would occur.

6.3 Impacts to Special-Status Wildlife

6.3.1 Direct Impacts

The project was designed and would be implemented to minimize impacts to special-status wildlife species. However, clearing and grubbing activities may have a direct impact on special-status species that have at least a moderate potential to occur on the project site, including bald eagle, California mountain kingsnake, large-blotched salamander, purple martin, San Bernardino flying squirrel, San Diegan tiger whiptail, southern rubber boa, Townsend's big-eared bat, tricolored blackbird, and Yuma myotis. However, due to the small size of the proposed project, direct impacts to these species, if present, would not be expect to significantly reduce regional populations numbers. Therefore, impacts to these species would be less than significant.

6.3.2 Indirect Impacts

The project site is currently an active camp with numerous access roads and trails. Indirect impacts from construction-related noise and vibration and lighting are not anticipated. Substantial long-term impacts due to noise, lighting, and traffic collisions to nocturnal wildlife are not expected beyond the existing condition. Some wildlife may be at higher risk of collision due to increased traffic Apple Canyon Road, but this increased risk is unlikely to measurably reduce the sustainability of the off-site populations.

6.4 Impacts to Jurisdictional Wetlands and Waters

6.4.1 Direct Impacts

Project-related activities are not expected to directly impact Apple Canyon Creek or Drainage A; therefore, implementation of the proposed project will not require regulatory permits from ACOE, RWQCB, or CDFW pursuant to the Clean Water Act and Sections 1600 of the California Fish and Game Code. However, if project-related activities are anticipated to encroach within any of these jurisdictional features, appropriate permits would need to be obtained from the regulatory agencies prior to project-related activities.

6.4.2 Indirect Impacts

Indirect impacts to jurisdictional waters could result primarily from adverse indirect edge effects. Indirect edge effects are defined as side effects of the project that do not directly impact habitat, vegetation communities, species, or water quality, but might have an effect on the long-term vitality of these resources if left unmanaged. During construction activities, edge effects may include construction-related soil erosion and water runoff. Potential long-term indirect impacts on jurisdictional waters within the site could result from increased human presence (utilizing the Thrive Path), trash, and pollution. However, with implementation of construction and water quality BMPs, there would be no short-term or long-term indirect impacts to jurisdictional waters.

6.5 Impacts to Wildlife Corridors/Habitat Linkages

6.5.1 Direct Impacts

The project site is located within a Western Riverside MSHCP core area. However, the proposed project improvements would not result in significant direct impacts to wildlife corridors/habitat linkages.

6.5.2 Indirect Impacts

The proposed project would not result in significant indirect impacts to wildlife corridors or habitat linkages. Furthermore, no long-term edge effects to a corridor or linkage, such as noise or lighting, would occur with project implementation.

6.6 Cumulative Impacts

Cumulative biological impacts due to construction of the project, in combination with other past, current, and future development projects, could adversely impact biological resources in the region. However, incorporation of similar project design features on a project-by-project basis, would reduce cumulative biological impacts to less than significant. Other past, current, and foreseeable future projects would have to mitigate for impacts to sensitive biological resources and comply with the same jurisdictional waters requirements. Therefore, the project would not contribute to long-term cumulative impacts to biological resources.

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7 SIGNIFICANT IMPACTS AND MITIGATION

7.1 Explanation of Findings of Significance

Impacts to special-status vegetation communities, plant and wildlife species, and jurisdictional waters, including wetlands, must be quantified and analyzed to determine whether such impacts are significant under CEQA. CEQA Guidelines Section 15064(b) states that an ironclad definition of "significant" effect is not possible, because the significance of an activity may vary with the setting. Appendix G of the CEQA Guidelines, however, does provide "examples of consequences which may be deemed to be a significant effect on the environment" (CEQA Guidelines, Section 15064[e]). These effects include substantial effects on rare or endangered species of animal or plant or the habitat of the species. CEQA Guidelines Section 15065(a) is also helpful in defining whether a project may have "a significant effect on the environment." Under that section, a proposed project may have a significant effect on the environment if the project has the potential to: (1) substantially degrade the quality of the environment, (2) substantially reduce the habitat of a fish or wildlife species, (3) cause a fish or wildlife population to drop below self-sustaining levels, (4) threaten to eliminate a plant or animal community, (5) reduce the number or restrict the range of a rare or endangered plant or animal, or (6) eliminate important examples of a major period of California history or prehistory.

The following are the significance thresholds for biological resources provided in the CEQA Guidelines Appendix G Environmental Checklist, which states that a project could potentially have a significant affect if it:

- **Impact BIO-1.** Has a substantial adverse effect, either directly or through habitat modifications, on any species identified as being a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS
- **Impact BIO-2.** Has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by CDFW or USFWS
- **Impact BIO-3.** Has a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means
- **Impact BIO-4.** Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedes the use of native wildlife nursery sites

- **Impact BIO-5.** Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance
- **Impact BIO-6.** Conflicts with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

The evaluation of whether or not an impact to a particular biological resource is significant must consider both the resource itself and the role of that resource in a regional context. Substantial impacts are those that contribute to, or result in, permanent loss of an important resource, such as a population of a rare plant or animal species. Impacts may be important locally, because they result in an adverse alteration of existing site conditions, but considered not significant because they do not contribute substantially to the permanent loss of that resource regionally. The severity of an impact is the primary determinant of whether or not that impact can be mitigated to a level below significance.

The following significance determinations were made based on the impacts of the proposed Project.

7.2 Impact BIO-1: Special-Status Species

7.2.1 Special-Status Plants

There are no special-status plant species within the project site and there would be no indirect impacts to off-site special-status plants; therefore, there would be no significant impacts to special-status plant species.

7.2.2 Special-Status Wildlife

Potential direct impacts could occur to special-status species covered by the MSHCP. However, impacts would not be significant and no additional mitigation would be required beyond ensuring compliance with the MSHCP.

The study area supports suitable habitat for migratory bird species. Nesting migratory birds are protected under the Migratory Bird Treaty Act and California Fish and Game Code Section 3500. Compliance with these regulations is required. Therefore, as a project design feature for the proposed project, construction activities would avoid the bird breeding season (generally February through August) to ensure compliance with federal and state laws. If avoidance of the bird breeding season is not feasible, then a preconstruction nesting bird survey would be conducted by a qualified biologist to ensure that birds are not engaged in active nesting within 300 feet of the project's construction limits. If the biologist finds any nesting birds within 300 feet of the limits of construction (or within 500 feet for raptors), the biologist shall clearly mark the location of the nest (with staking and flags) and, if warranted, identify feasible measures to avoid any potential adverse effects on nesting birds. Appropriate measures may include limiting disturbances within a certain distance of the nest until nesting is complete. If appropriate avoidance buffers are implemented, a biological monitor shall be present during construction activities to ensure that nesting birds are not disturbed. The biological monitor shall have authority to halt any construction activity determined to be potentially disturbing to the nesting of any bird. Construction may continue when the monitor determines the activity can be carried out without disruption of nesting, or when the nest is determined to have fledged or failed.

7.3 Impact BIO-2: Sensitive Vegetation Communities or Land Covers

No impacts to special-status vegetation communities are expected to occur as a result of the proposed improvements. Although not considered special-status, construction is expected to result in direct impacts to chaparral and big sagebrush scrub communities. However, due to the small footprint, impacts to this community are not expected to be significant. Construction of the project may result in short-term construction-related indirect impacts to the montane riparian scrub habitat. However, standard construction BMPs and construction-related minimization measures to control erosion and runoff will be implemented to minimize these adverse effects.

7.4 Impact BIO-3: Jurisdictional Waters

The proposed project would not result in direct or indirect impacts to jurisdictional waters.

7.5 Impact BIO-4: Wildlife Corridors and Migratory Routes

Project implementation would not interfere substantially with the movement of any native resident or migratory bird species. The project site has potential to support nesting resident and migratory birds. The applicant will comply with all federal and state regulations that protect nesting and migratory bird species; therefore, there would be no significant impacts to migratory birds.

7.6 Impact BIO-5: Local Policies or Ordinances

The proposed project has been designed to comply with the County's policies and ordinances. Implementation of the proposed project would not require removal of native trees located on the project site. Therefore, with compliance with local regulatory requirements, no impacts associated with local policies or ordinances would occur.

7.7 Impact BIO-6: Habitat Conservation Plan

As described in Section 5.5, the project is consistent with the MSHCP. The project will pay any MSHCP development fee, as required. As a result, the project will not be in conflict with the MSHCP.

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APPENDIX A

Species Compendiums

APPENDIX A
Species Compendiums

PLANT COMPENDIUM

VASCULAR SPECIES

GYMNOSPERMS AND GNETOPHYTES

CUPRESSACEAE—CYPRESS FAMILY

Juniperus californica—California juniper

PINACEAE—PINE FAMILY

Pinus jeffreyi—Jeffrey pine
Pinus ponderosa—Ponderosa pine

MONOCOTS

JUNCACEAE—RUSH FAMILY

Juncus mexicanus—Mexican rush

POACEAE—GRASS FAMILY

Stipa speciosa—desert needlegrass
* *Bromus hordeaceus*—soft brome
* *Bromus madritensis* ssp. *rubens*—red brome
* *Bromus tectorum*—cheatgrass
* *Cynodon dactylon*—Bermudagrass
* *Poa annua*—annual bluegrass
Muhlenbergia rigens—deer grass beds
Distichlis spicata—salt grass

TYPHACEAE—CATTAIL FAMILY

Typha latifolia—broadleaf cattail

EUDICOTS

ASTERACEAE—SUNFLOWER FAMILY

Artemisia tridentata—big sagebrush
Ericameria pinifolia—pinebush
Erigeron divergens—spreading fleabane
Pseudognaphalium sp.—cudweed
* *Matricaria discoidea*—disc mayweed
* *Sonchus asper*—spiny sowthistle
Baccharis salicifolia—mulefat

BETULACEAE—BIRCH FAMILY
Alnus rhombifolia—white alder

BRASSICACEAE—MUSTARD FAMILY
* *Brassica nigra*—black mustard

CACTACEAE—CACTUS FAMILY
Cylindropuntia sp.—cholla

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY
Symphoricarpos mollis—creeping snowberry

CHENOPODIACEAE—GOOSEFOOT FAMILY
* *Salsola tragus*—prickly Russian thistle

DIPSACACEAE—TEASEL FAMILY
* *Dipsacus sativus*—Indian teasel

ERICACEAE—HEATH FAMILY
Arctostaphylos glauca—bigberry manzanita
Arctostaphylos glandulosa—Eastwood manzanita

FABACEAE—LEGUME FAMILY
Lupinus sp.—lupine
* *Melilotus indicus*—annual yellow sweetclover

FAGACEAE—OAK FAMILY
Quercus dumosa—Nuttall’s scrub oak
Quercus agrifolia—coast live oak

GERANIACEAE—GERANIUM FAMILY
* *Erodium cicutarium*—redstem stork’s bill

MONTIACEAE—MONTIA FAMILY
Claytonia perfoliata—miner’s lettuce

PHRYMACEAE—LOPSEED FAMILY
Mimulus guttatus—common monkey flower

PLANTAGINACEAE—PLANTAIN FAMILY
* *Plantago lanceolata*—narrowleaf plantain

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum fasciculatum var. *polifolium*—Eastern Mojave buckwheat

RHAMNACEAE—BUCKTHORN FAMILY

Ceanothus perplexans—desert ceanothus
Ceanothus cuneatus—wedge leaf ceanothus

ROSACEAE—ROSE FAMILY

Adenostoma fasciculatum—chamise
Adenostoma sparsifolium—redshank
Cercocarpus betuloides—birch leaf mountain mahogany
Rosa californica—California rose briar

RUBIACEAE—MADDER FAMILY

Galium andrewsii—phloxleaf bedstraw

SALICACEAE—WILLOW FAMILY

Salix lasiolepis—arroyo willow
Populus fremontii—Fremont cottonwood

URTICACEAE—NETTLE FAMILY

Urtica dioica—stinging nettle

* signifies introduced (non-native) species

WILDLIFE COMPENDIUM

AMPHIBIAN

FROGS

HYLIDAE—TREEFROGS

Pseudacris hypochondriaca—Baja California treefrog

BIRD

BLACKBIRDS, ORIOLES AND ALLIES

ICTERIDAE—BLACKBIRDS

Agelaius phoeniceus—red-winged blackbird
Euphagus cyanocephalus—Brewer's blackbird

BUSHTITS

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

EMBERIZINES

EMBERIZIDAE—EMBERIZIDS

Junco hyemalis—dark-eyed junco
Pipilo maculatus—spotted towhee
Zonotrichia leucophrys—white-crowned sparrow

FINCHES

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Haemorhous mexicanus—house finch

HAWKS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Buteo jamaicensis—red-tailed hawk

HUMMINGBIRDS

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

JAYS, MAGPIES AND CROWS

CORVIDAE—CROWS AND JAYS

Aphelocoma californica—California scrub-jay
Corvus brachyrhynchos—American crow
Corvus corax—common raven

THRUSHES

TURDIDAE—THRUSHES

Sialia mexicana—western bluebird
Turdus migratorius—American robin

TITMICE

PARIDAE—CHICKADEES AND TITMICE

Poecile gambeli—mountain chickadee

WATERFOWL

ANATIDAE—DUCKS, GEESE, AND SWANS

Anas platyrhynchos—mallard

WOODPECKERS

PICIDAE—WOODPECKERS AND ALLIES

Melanerpes formicivorus—acorn woodpecker

FISH

NORTH AMERICAN FRESHWATER CATFISHES

ICTALURIDAE—CATFISH

* *Ameiurus* spp.—bullhead catfish

OTHER BONY FISHES

POECILIIDAE—POECILIIDS

* *Gambusia affinis*—mosquitofish

MINNOWS AND CARPS

CYPRINIDAE—MINNOWS AND CARPS

* *Cyprinus carpio*—common carp

MAMMAL

DOMESTIC

CANIDAE—WOLVES AND FOXES

* *Canis lupus familiaris*—domestic dog

HARES AND RABBITS

LEPORIDAE—HARES AND RABBITS

Sylvilagus audubonii—desert cottontail

RACCOONS

PROCYONIDAE—RACCOONS AND RELATIVES

Procyon lotor—raccoon

SQUIRRELS

SCIURIDAE—SQUIRRELS

Spermophilus (Otospermophilus) beecheyi—California ground squirrel

REPTILE

LIZARDS

PHRYNOSOMATIDAE—IGUANID LIZARDS

Sceloporus occidentalis—western fence lizard

* signifies introduced (non-native) species

APPENDIX B

Photo Documentation

APPENDIX B
Photo Documentation

	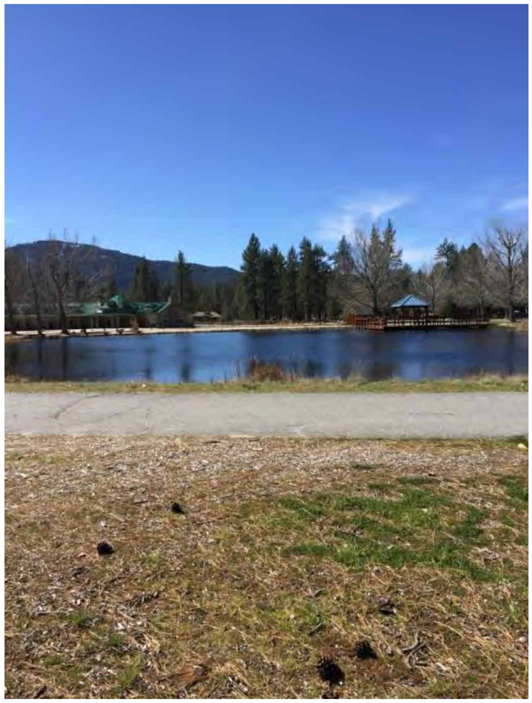
Photo 1: View of disturbed habitat from center of project site looking north	**Photo 2:** View of fire suppression pond in center of project site looking west
	
Photo 3: View of camp cabins from northwest portion of project site looking east	**Photo 4:** View of west-central portion of project site boundary next to Hurkey Creek Park looking west

Photo 5: Apple Canyon Creek in northeast portion of study area just offsite looking northeast (upstream).

Photo 6: Apple Canyon Creek in central portion of project site looking north (upstream).

Photo 7: Apple Canyon Creek in southern portion of project site looking south (downstream).

Photo 8: Drainage A in northern portion of study area just offsite looking southeast (downstream).

APPENDIX C

Special-Status Plant and Wildlife Detected or Potentially Occurring within the Project Site

Table C1
Special-Status Plants Detected or Potentially Occurring within the Project Site

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Abronia villosa var. *aurita*	chaparral sand-verbena	None/None/1B.1	Chaparral, coastal scrub, desert dunes; sandy/annual herb/Jan–Sep/246–5249	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Acmispon haydonii	pygmy lotus	None/None/1B.3	Pinyon and juniper woodland, Sonoran desert scrub; rocky/perennial herb/Jan–June/1706–3937	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Allium marvinii	Yucaipa onion	None/None/1B.2	Chaparral (clay, openings)/perennial bulbiferous herb/Apr–May/2493–3494	Not expected to occur. The project site is outside of the species' known elevation range.
Ambrosia monogyra	singlewhorl burrobrush	None/None/2B.2	Chaparral, Sonoran desert scrub; sandy/perennial shrub/Aug–Nov/33–1640	Not expected to occur. The project site is outside of the species' known elevation range.
Androsace elongata ssp. *acuta*	California androsace	None/None/4.2	Chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley and foothill grassland/annual herb/Mar–June/492–4281	Not expected to occur. The project site is outside of the species' known elevation range.
Arctostaphylos parryana ssp. *tumescens*	interior manzanita	None/None/4.3	Chaparral (montane), cismontane woodland/perennial evergreen shrub/Feb–Apr/6890–7579	Not expected to occur. The project site is outside of the species' known elevation range.
Astragalus lentiginosus var. *coachellae*	Coachella Valley milk-vetch	FE/None/1B.2	Desert dunes, Sonoran desert scrub (sandy)/annual / perennial herb/Feb–May/131–2149	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Astragalus pachypus var. *jaegeri*	Jaeger's bush milk-vetch	None/None/1B.1	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland; sandy or rocky/perennial shrub/Dec–June/1198–3199	Not expected to occur. The project site is outside of the species' known elevation range.
Atriplex parishii	Parish's brittlescale	None/None/1B.1	Chenopod scrub, playas, vernal pools; alkaline/annual herb/June–Oct/82–6234	Not expected to occur. No suitable habitat present.
Ayenia compacta	California ayenia	None/None/2B.3	Mojavean desert scrub, Sonoran desert scrub; rocky/perennial herb/Mar–Apr/492–3593	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Boechera johnstonii	Johnston's rockcress	None/None/1B.2	Chaparral, lower montane coniferous forest; often on eroded clay/perennial herb/Feb–June/4429–7054	Not expected to occur. The project site is outside of the species' known elevation range.
Calochortus palmeri var. *munzii*	San Jacinto mariposa lily	None/None/1B.2	Chaparral, lower montane coniferous forest, meadows and seeps/perennial bulbiferous herb/May–July/2805–7218	Low potential to occur. Potential chaparral and coniferous forest habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Calochortus palmeri var. *palmeri*	Palmer's mariposa lily	None/None/1B.2	Chaparral, lower montane coniferous forest, meadows and seeps; mesic/perennial bulbiferous herb/Apr–July/2329–7841	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Calochortus plummerae	Plummer's mariposa lily	None/None/4.2	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland; granitic, rocky/perennial bulbiferous herb/May–July/328–5577	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Carex occidentalis	western sedge	None/None/2B.3	Lower montane coniferous forest, meadows and seeps/perennial rhizomatous herb/June–Aug/5397–10285	Not expected to occur. The project site is outside of the species' known elevation range.
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	None/None/1B.2	Chaparral, meadows and seeps, pebble plain, riparian woodland, upper montane coniferous forest; mesic/annual herb (hemiparasitic)/May–Aug/4265–7841	Moderate potential to occur. Potential coniferous forest habitat is present adjacent to the project site.
Caulanthus simulans	Payson's jewelflower	None/None/4.2	Chaparral, coastal scrub; sandy, granitic/annual herb/(Feb) Mar–May (June)/295–7218	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Centromadia pungens ssp. *laevis*	smooth tarplant	None/None/1B.1	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland; alkaline/annual herb/Apr–Sep/0–2100	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Chaenactis parishii	Parish's chaenactis	None/None/1B.3	Chaparral (rocky)/perennial herb/May–July/4265–8202	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Chorizanthe leptotheca	Peninsular spineflower	None/None/4.2	Chaparral, coastal scrub, lower montane coniferous forest; alluvial fan, granitic/annual herb/May–Aug/984–6234	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Chorizanthe parryi var. *parryi*	Parry's spineflower	None/None/1B.1	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland; sandy or rocky, openings/annual herb/Apr–June/902–4003	Not expected to occur. The project site is outside of the species' known elevation range.

Table C1
Special-Status Plants Detected or Potentially Occurring within the Project Site

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Chorizanthe polygonoides var. *longispina*	long-spined spineflower	None/None/1B.2	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools; often clay/annual herb/Apr–July/98–5020	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Chorizanthe xanti var. *leucotheca*	white-bracted spineflower	None/None/1B.2	Coastal scrub (alluvial fans), Mojavean desert scrub, pinyon and juniper woodland; sandy or gravelly/annual herb/Apr–June/984–3937	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Cryptantha costata	ribbed cryptantha	None/None/4.3	Desert dunes, Mojavean desert scrub, Sonoran desert scrub; sandy/annual herb/Feb–May/-197–1640	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Cryptantha holoptera	winged cryptantha	None/None/4.3	Mojavean desert scrub, Sonoran desert scrub/annual herb/Mar–Apr/328–5545	Not expected to occur. No suitable habitat present.
Deinandra mohavensis	Mojave tarplant	None/CE/1B.3	Chaparral, coastal scrub, riparian scrub; mesic/annual herb/(May) June–Oct (Jan)/2100–5249	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Deinandra paniculata	paniculate tarplant	None/None/4.2	Coastal scrub, valley and foothill grassland, vernal pools; usually vernally mesic, sometimes sandy/annual herb/Apr–Nov/82–3084	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Delphinium hesperium ssp. *cuyamacae*	Cuyamaca larkspur	None/CR/1B.2	Lower montane coniferous forest, meadows and seeps, vernal pools; mesic/perennial herb/May–July/4003–5351	Not expected to occur. The project site lacks suitable habitat (meadows, seeps, and vernal pools).
Delphinium parishii ssp. *subglobosum*	Colorado Desert larkspur	None/None/4.3	Chaparral, cismontane woodland, pinyon and juniper woodland, Sonoran desert scrub/perennial herb/Mar–June/1969–5906	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Delphinium parryi ssp. *purpureum*	Mt. Pinos larkspur	None/None/4.3	Chaparral, Mojavean desert scrub, pinyon and juniper woodland/perennial herb/May–June/3281–8530	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Dieteria canescens var. *ziegleri*	Ziegler's aster	None/None/1B.2	Lower montane coniferous forest, upper montane coniferous forest/perennial herb/July–Oct/4501–8199	Not expected to occur. The project site is outside of the species' known elevation range.
Dodecahema leptoceras	slender-horned spineflower	FE/CE/1B.1	Chaparral, cismontane woodland, coastal scrub (alluvial fan); sandy/annual herb/Apr–June/656–2493	Not expected to occur. The project site is outside of the species' known elevation range.
Draba saxosa	Southern California rock draba	None/None/1B.3	Alpine boulder and rock field, subalpine coniferous forest, upper montane coniferous forest; rocky/perennial herb/June–Sep/8005–11811	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Erigeron breweri var. *jacinteus*	San Jacinto Mountains daisy	None/None/4.3	Subalpine coniferous forest, upper montane coniferous forest; rocky/perennial rhizomatous herb/June–Sep/8858–9514	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Eriogonum evanidum	vanishing wild buckwheat	None/None/1B.1	Chaparral, cismontane woodland, lower montane coniferous forest, pinyon and juniper woodland; sandy or gravelly/annual herb/July–Oct/3609–7300	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Euphorbia arizonica	Arizona spurge	None/None/2B.3	Sonoran desert scrub (sandy)/perennial herb/Mar–Apr/164–984	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Galium angustifolium ssp. *jacinticum*	San Jacinto Mountains bedstraw	None/None/1B.3	Lower montane coniferous forest/perennial herb/June–Aug/4429–6890	Not expected to occur. The project site is outside of the species' known elevation range.
Galium californicum ssp. *primum*	Alvin Meadow bedstraw	None/None/1B.2	Chaparral, lower montane coniferous forest; granitic, sandy/perennial herb/May–July/4429–5577	Not expected to occur. The project site is outside of the species' known elevation range.
Heuchera hirsutissima	shaggy-haired alumroot	None/None/1B.3	Subalpine coniferous forest, upper montane coniferous forest; rocky, granitic/perennial rhizomatous herb/(May) June–July/4987–11483	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Heuchera parishii	Parish's alumroot	None/None/1B.3	Alpine boulder and rock field, lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest; rocky, sometimes carbonate/perennial rhizomatous herb/June–Aug/4921–12467	Not expected to occur. The project site is outside of the species' known elevation range.
Horkelia bolanderi	Bolander's horkelia	None/None/1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland; edges, vernally mesic areas/perennial herb/June–Aug/1476–3609	Not expected to occur. The project site is outside of the species' known elevation range.
Hulsea vestita ssp. *callicarpha*	beautiful hulsea	None/None/4.2	Chaparral, lower montane coniferous forest; rocky or gravelly, granitic/perennial herb/May–Oct/3002–10007	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.

Table C1
Special-Status Plants Detected or Potentially Occurring within the Project Site

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Imperata brevifolia	California satintail	None/None/2B.1	Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub; mesic/perennial rhizomatous herb/Sep–May/0–3986	Not expected to occur. The project site is outside of the species' known elevation range.
Ivesia callida	Tahquitz ivesia	None/CR/1B.3	Upper montane coniferous forest (granitic, rocky)/perennial herb/July–Sep/7907–8038	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Jaffueliobryum raui	Rau's jaffueliobryum moss	None/None/2B.3	Alpine dwarf scrub, chaparral, Mojavean desert scrub, Sonoran desert scrub; dry openings, rock crevices, carbonate/moss/N.A./1608–6890	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Juncus duranii	Duran's rush	None/None/4.3	Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest; mesic/perennial rhizomatous herb/July–Aug/5801–9199	Not expected to occur. The project site is outside of the species' known elevation range.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/None/1B.1	Marshes and swamps (coastal salt), playas, vernal pools/annual herb/Feb–June/3–4003	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None/None/4.3	Chaparral, coastal scrub/annual herb/Jan–July/3–2904	Not expected to occur. The project site is outside of the species' known elevation range.
Lilium parryi	lemon lily	None/None/1B.2	Lower montane coniferous forest, meadows and seeps, riparian forest, upper montane coniferous forest; mesic/perennial bulbiferous herb/July–Aug/4003–9006	Moderate potential to occur. Potential coniferous forest habitat is present adjacent to the project site.
Limnanthes alba ssp. *parishii*	Parish's meadowfoam	None/CE/1B.2	Lower montane coniferous forest, meadows and seeps, vernal pools; vernally mesic/annual herb/Apr–June/1969–6562	Not expected to occur. The project site lacks suitable habitat (meadows, seeps, and vernal pools).
Linanthus jaegeri	San Jacinto linanthus	None/None/1B.2	Subalpine coniferous forest, upper montane coniferous forest; granitic, rocky/perennial herb/July–Sep/7201–10007	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Linanthus maculatus ssp. *maculatus*	Little San Bernardino Mtns. linanthus	None/None/1B.2	Desert dunes, Joshua tree woodland, Mojavean desert scrub, Sonoran desert scrub, sandy/annual herb/Mar–May/459–4003	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Malaxis monophyllos var. *brachypoda*	white bog adder's-mouth	None/None/2B.1	Bogs and fens, meadows and seeps, upper montane coniferous forest; mesic/perennial bulbiferous herb/June–Aug/7218–8999	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Meesia triquetra	three-ranked hump moss	None/None/4.2	Bogs and fens, meadows and seeps, subalpine coniferous forest, upper montane coniferous forest (mesic); soil/moss/July/4265–9688	Not expected to occur. No suitable habitat present.
Meesia uliginosa	broad-nerved hump moss	None/None/2B.2	Bogs and fens, meadows and seeps, subalpine coniferous forest, upper montane coniferous forest; damp soil/moss/Oct/3970–9199	Not expected to occur. No suitable habitat present.
Mimulus diffusus	Palomar monkeyflower	None/None/4.3	Chaparral, lower montane coniferous forest; sandy or gravelly/annual herb/Apr–June/4003–6004	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Monardella macrantha ssp. *hallii*	Hall's monardella	None/None/1B.3	Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland/perennial rhizomatous herb/June–Oct/2395–7201	Moderate potential to occur. Potential chaparral habitat is present adjacent to the project site.
Monardella nana ssp. *leptosiphon*	San Felipe monardella	None/None/1B.2	Chaparral, lower montane coniferous forest/perennial rhizomatous herb/June–July/3937–6086	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Nemacaulis denudata var. *gracilis*	slender cottonheads	None/None/2B.2	Coastal dunes, desert dunes, Sonoran desert scrub/annual herb/(Mar) Apr–May/-164–1312	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Penstemon californicus	California beardtongue	None/None/1B.2	Chaparral, lower montane coniferous forest, pinyon and juniper woodland; sandy/perennial herb/May–June (Aug)/3839–7546	Moderate potential to occur. Potential chaparral habitat is present adjacent to the project site.
Penstemon clevelandii var. *connatus*	San Jacinto beardtongue	None/None/4.3	Chaparral, pinyon and juniper woodland, Sonoran desert scrub; rocky/perennial herb/Mar–May/1312–4921	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.

Table C1
Special-Status Plants Detected or Potentially Occurring within the Project Site

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Potential to Occur
Pentachaeta aurea ssp. *aurea*	golden-rayed pentachaeta	None/None/4.2	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland, valley and foothill grassland/annual herb/Mar–July/262–6070	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Potentilla rimicola	cliff cinquefoil	None/None/2B.3	Subalpine coniferous forest, upper montane coniferous forest; granitic, rocky/perennial herb/July–Sep/7874–9186	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Rupertia rigida	Parish's rupertia	None/None/4.3	Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, pebble plain, valley and foothill grassland/perennial herb/June–Aug/2297–8202	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Saltugilia latimeri	Latimer's woodland-gilia	None/None/1B.2	Chaparral, Mojavean desert scrub, pinyon and juniper woodland; rocky or sandy, often granitic, sometimes washes/annual herb/Mar–June/1312–6234	Not expected to occur. Minimal suitable habitat is present and there are no recent occurrence records of the species within the vicinity of the study area. Further, project activities are not expected to disturb adjacent undisturbed, native habitat.
Scutellaria bolanderi ssp. *austromontana*	southern mountains skullcap	None/None/1B.2	Chaparral, cismontane woodland, lower montane coniferous forest; mesic/perennial rhizomatous herb/June–Aug/1394–6562	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Sedum niveum	Davidson's stonecrop	None/None/4.2	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest; rocky/perennial rhizomatous herb/June–Aug/6808–9843	Not expected to occur. The project site is outside of the species' known elevation range.
Selaginella asprella	bluish spike-moss	None/None/4.3	Cismontane woodland, lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, upper montane coniferous forest; granitic, rocky/perennial rhizomatous herb/July/5249–8858	Not expected to occur. The project site is outside of the species' known elevation range.
Selaginella eremophila	desert spike-moss	None/None/2B.2	Chaparral, Sonoran desert scrub (gravelly or rocky)/perennial rhizomatous herb/(May) June (July)/656–4249	Not expected to occur. The project site is outside of the species' known elevation range.
Sidotheca caryophylloides	chickweed oxytheca	None/None/4.3	Lower montane coniferous forest (sandy)/annual herb/July–Sep/3655–8530	Moderate potential to occur. Potential coniferous forest habitat is present adjacent to the project site.
Sidotheca emarginata	white-margined oxytheca	None/None/1B.3	Chaparral, lower montane coniferous forest, pinyon and juniper woodland/annual herb/(Feb) Apr–July (Aug)/3937–8202	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Stemodia durantifolia	purple stemodia	None/None/2B.1	Sonoran desert scrub (often mesic, sandy)/perennial herb/Jan–Dec/591–984	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Streptanthus bernardinus	Laguna Mountains jewelflower	None/None/4.3	Chaparral, lower montane coniferous forest/perennial herb/May–Aug/2198–8202	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Streptanthus campestris	southern jewelflower	None/None/1B.3	Chaparral, lower montane coniferous forest, pinyon and juniper woodland; rocky/perennial herb/(Apr) May–July/2953–7546	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Symphyotrichum defoliatum	San Bernardino aster	None/None/1B.2	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, valley and foothill grassland (vernally mesic); near ditches, streams, springs/perennial rhizomatous herb/July–Nov/7–6693	Moderate potential to occur. Potential coniferous forest habitat is present adjacent to the project site.
Syntrichopappus lemmonii	Lemmon's syntrichopappus	None/None/4.3	Chaparral, Joshua tree woodland, pinyon and juniper woodland; sandy or gravelly/annual herb/Apr–May (June)/1640–6004	Low potential to occur. Potential chaparral habitat is present adjacent to the project site; however, project activities are not expected to disturb adjacent undisturbed, native habitat.
Thelypteris puberula var. *sonorensis*	Sonoran maiden fern	None/None/2B.2	Meadows and seeps (seeps and streams)/perennial rhizomatous herb/Jan–Sep/164–2001	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Trichostema austromontanum ssp. *compactum*	Hidden Lake bluecurls	FT/None/1B.1	Upper montane coniferous forest (seasonally submerged lake margins)/annual herb/July–Sep/7874–8793	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.
Xylorhiza cognata	Mecca-aster	None/None/1B.2	Sonoran desert scrub/perennial herb/Jan–June/66–1312	Not expected to occur. The project site is outside of the species' known elevation range and there is no suitable habitat present.

Table C2
Special-Status Wildlife Detected or Potentially Occurring within the Project Site

Group	Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Amphibians	*Anaxyrus californicus*	arroyo toad	FE/SSC	Semi-arid areas near washes, sandy riverbanks, riparian areas, palm oasis, Joshua tree, mixed chaparral and sagebrush; stream channels for breeding (typically third order); adjacent stream terraces and uplands for foraging and wintering	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Amphibians	*Ensatina klauberi*	large-blotched salamander	None/WL	Moist and shaded evergreen and deciduous woodlands	Moderate potential to occur. Some suitable habitat occurs within the study area.
Amphibians	*Rana draytonii*	California red-legged frog	FT/SSC	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands	Low potential to occur. Minimal suitable habitat within the proposed program area and there are no records within the vicinity.
Amphibians	*Rana muscosa*	mountain yellow-legged frog	FE/SE, WL	Lakes, ponds, meadow streams, isolated pools, and open riverbanks; rocky canyons in narrow canyons and in chaparral	Not expected to occur. No suitable habitat present.
Reptiles	*Arizona elegans occidentalis*	California glossy snake	None/SSC	Commonly occurs in desert regions throughout southern California. Prefers open sandy areas with scattered brush. Also found in rocky areas.	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Reptiles	*Aspidoscelis hyperythra*	orange-throated whiptail	None/WL	Low-elevation coastal scrub, chaparral, and valley–foothill hardwood	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Reptiles	*Aspidoscelis tigris stejnegeri*	San Diegan tiger whiptail	None/SSC	Hot and dry areas with sparse foliage, including chaparral, woodland, and riparian areas.	High potential to occur. Suitable habitat occurs within the study area and there are records of the species in the vicinity of the study area.
Reptiles	*Charina umbratica*	southern rubber boa	None/ST	Montane oak–conifer and mixed-conifer forests, montane chaparral, wet meadows; usually in vicinity of streams or wet meadows	High potential to occur. Suitable habitat occurs within the study area and there are records of the species in the vicinity of the study area.
Reptiles	*Crotalus ruber*	red diamondback rattlesnake	None/SSC	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	Low potential to occur. Minimal suitable habitat within the proposed program area and there are no records within the vicinity.
Reptiles	*Lampropeltis zonata (parvirubra)*	California mountain kingsnake (San Bernardino population)	None/WL	Wide range of habitats including conifer forest, oak–pine woodlands, riparian woodland, chaparral, manzanita, and coastal scrub	High potential to occur. Suitable habitat occurs within the study area and there are records of the species in the vicinity of the study area.
Reptiles	*Phrynosoma blainvillii*	Blainville's horned lizard	None/SSC	Open areas of sandy soil in valleys, foothills, and semi-arid mountains including coastal scrub, chaparral, valley–foothill hardwood, conifer, riparian, pine–cypress, juniper, and annual grassland habitats	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Reptiles	*Phrynosoma mcallii*	flat-tailed horned lizard	None/PSE, SSC	Desert washes and flats with sparse low-diversity vegetation cover and sandy soils	Not expected to occur. No suitable vegetation present.
Reptiles	*Uma inornata*	Coachella fringe-toed lizard	FT/SE	Sand dunes in sparse desert scrub, alkali scrub, and desert wash	Not expected to occur. No suitable vegetation present.
Birds	*Accipiter cooperii* (nesting)	Cooper's hawk	None/WL	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland habitats often near water	Not expected to occur. No suitable vegetation present.
Birds	*Agelaius tricolor* (nesting colony)	tricolored blackbird	None/PSE, SSC	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberrry; forages in grasslands, woodland, and agriculture	Moderate potential to occur. Minimal suitable habitat is present within the project site.
Birds	*Aimophila ruficeps canescens*	Southern California rufous-crowned sparrow	None/WL	Nests and forages in open coastal scrub and chaparral with low cover of scattered scrub interspersed with rocky and grassy patches	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Birds	*Aquila chrysaetos* (nesting and wintering)	golden eagle	None/FP, WL	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	Low potential to occur. Some suitable habitat is present but has not been recorded in the vicinity of the study area.
Birds	*Artemisiospiza belli belli*	Bell's sage sparrow	None/WL	Nests and forages in coastal scrub and dry chaparral; typically in large, unfragmented patches dominated by chamise; nests in more dense patches but uses more open habitat in winter	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Birds	*Cypseloides niger* (nesting)	black swift	None/SSC	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Birds	*Empidonax traillii extimus* (nesting)	southwestern willow flycatcher	FT/SE	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	Not expected to occur. No suitable vegetation present.

Table C2
Special-Status Wildlife Detected or Potentially Occurring within the Project Site

Group	Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Birds	*Falco mexicanus* (nesting)	prairie falcon	None/WL	Forages in grassland, savanna, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Birds	*Haliaeetus leucocephalus* (nesting and wintering)	bald eagle	FDL, BCC/SE, FP	Nests in forested areas adjacent to large bodies of water, including seacoasts, rivers, swamps, large lakes; winters near large bodies of water in lowlands and mountains	Moderate potential to occur. Minimal suitable habitat is present within the project site.
Birds	*Polioptila californica californica*	coastal California gnatcatcher	FT/SSC	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%; majority of nesting at less than 1,000 feet above mean sea level	Not expected to occur. No suitable vegetation present.
Birds	*Polioptila melanura*	black-tailed gnatcatcher	None/WL	Nests and forages in wooded desert wash and desert scrub	Not expected to occur. No suitable vegetation present.
Birds	*Progne subis* (nesting)	purple martin	None/SSC	Nests and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways	High potential to occur. Suitable habitat occurs within the study area and there are records of the species in the vicinity of the study area.
Birds	*Setophaga petechia* (nesting)	yellow warbler	None/SSC	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine, and mixed-conifer habitats	Low potential to occur. Some suitable habitat is present but has not been recorded in the vicinity of the study area.
Birds	*Toxostoma crissale*	Crissal thrasher	None/SSC	Nests and forages in desert riparian and desert wash; dense thickets of sagebrush and other shrubs such as mesquite, iron catclaw acacia, and arrowweed willow within juniper and pinyon–juniper woodlands	Not expected to occur. No suitable vegetation present.
Birds	*Toxostoma lecontei*	Le Conte's thrasher	None/SSC	Nests and forages in desert wash, desert scrub, alkali desert scrub, desert succulent, and Joshua tree habitats; nests in spiny shrubs or cactus	Not expected to occur. No suitable vegetation present.
Birds	*Vireo bellii pusillus* (nesting)	least Bell's vireo	FT/SE	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	Low potential to occur. Some suitable habitat is present but has not been recorded in the vicinity of the study area.
Mammals	*Antrozous pallidus*	pallid bat	None/SSC	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	Low potential to occur. Minimal suitable habitat within the proposed program area and there are no records within the vicinity.
Mammals	*Chaetodipus californicus femoralis*	Dulzura pocket mouse	None/SSC	Open habitat, coastal scrub, chaparral, oak woodland, chamise chaparral, mixed-conifer habitats; disturbance specialist; 0 to 3,000 feet above mean sea level	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Chaetodipus fallax pallidus*	pallid San Diego pocket mouse	None/SSC	Desert wash, desert scrub, desert succulent scrub, and pinyon–juniper woodland	Not expected to occur. No suitable vegetation present.
Mammals	*Corynorhinus townsendii*	Townsend's big-eared bat	None/SSC	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	Moderate potential to occur. Minimal suitable habitat is present within the project site.
Mammals	*Dipodomys merriami collinus*	Earthquake Merriam's kangaroo rat	None/None	Riversidean sage scrub, chaparral, and non-native grassland; associated with sandy loam soils	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Dipodomys merriami parvus*	San Bernardino kangaroo rat	FE/SSC	Sparse scrub habitat, alluvial scrub/coastal scrub habitats on gravelly and sandy soils near river and stream terraces	Not expected to occur. No suitable vegetation present.
Mammals	*Dipodomys stephensi*	Stephens' kangaroo rat	FE/ST	Annual and perennial grassland habitats, coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Glaucomys sabrinus californicus*	San Bernardino flying squirrel	None/SSC	Coniferous and deciduous forests, including riparian forests	Moderate potential to occur. Minimal suitable habitat is present within the project site.
Mammals	*Lasiurus xanthinus*	western yellow bat	None/SSC	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Lepus californicus bennettii*	San Diego black-tailed jackrabbit	None/SSC	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed areas, and rangelands	Not expected to occur. No suitable vegetation present.
Mammals	*Myotis yumanensis*	Yuma myotis	None/None	Riparian, arid scrublands and deserts, and forests associated with water (streams, rivers, tinajas); roosts in bridges, buildings, cliff crevices, caves, mines, and trees	Moderate potential to occur. Minimal suitable habitat is present within the project site.

Table C2
Special-Status Wildlife Detected or Potentially Occurring within the Project Site

Group	Scientific Name	Common Name	Status (Federal/State)	Habitat	Potential to Occur
Mammals	*Neotamias speciosus speciosus*	lodgepole chipmunk	None/None	Lodgepole pine forests	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Neotoma lepida intermedia*	San Diego desert woodrat	None/SSC	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Nyctinomops femorosaccus*	pocketed free-tailed bat	None/SSC	Pinyon–juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oases; roosts in high cliffs or rock outcrops with drop-offs, caverns, and buildings	Low potential to occur. Minimal suitable habitat within the proposed program area and there are no records within the vicinity.
Mammals	*Nyctinomops macrotis*	big free-tailed bat	None/SSC	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	Not expected to occur. No suitable vegetation present.
Mammals	*Onychomys torridus ramona*	southern grasshopper mouse	None/SSC	Grassland and sparse coastal scrub	Not expected to occur. No suitable vegetation present.
Mammals	*Ovis canadensis nelsoni* pop. 2 DPS	Peninsular bighorn sheep DPS	FE/ST, FP	Dry, rocky, low-elevation desert slopes, canyons, and washes; females near water during lambing season	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Mammals	*Perognathus longimembris brevinasus*	Los Angeles pocket mouse	None/SSC	Lower-elevation grassland, alluvial sage scrub, and coastal scrub	Not expected to occur. No suitable vegetation present.
Mammals	*Spermophilus (Xerospermophilus) tereticaudus chlorus*	Palm Springs round-tailed ground squirrel	None/SSC	Sandy arid regions of Lower Sonoran Life Zone including creosote bush scrub and creosote–palo verde	Not expected to occur. No suitable vegetation present.
Mammals	*Taxidea taxus*	American badger	None/SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Invertebrates	*Calileptoneta oasa*	Andreas Canyon leptonetid spider	None/None	Known only from the type locality Andreas Canyon, Palm Springs, Riverside County	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Invertebrates	*Dinacoma caseyi*	Casey's June beetle	FE/None	Found only in two populations in a small area of southern Palm Springs	Not expected to occur. No suitable vegetation present.
Invertebrates	*Euphydryas editha quino*	quino checkerspot butterfly	FE/None	Annual forblands, grassland, open coastal scrub and chaparral; often soils with cryptogamic crusts and fine-textured clay; host plants include Plantago erecta, Antirrhinum coulterianum, and Plantago patagonica (Silverado Occurrence Complex)	Not expected to occur. There is no suitable habitat within the study area and the species is not recorded in the vicinity.
Invertebrates	*Halictus harmonius*	haromonius halictid bee	None/None	Known only from the foothills of the San Bernardino Mountains, possibly also the San Jacinto Mountains	Not expected to occur. No suitable vegetation present.
Invertebrates	*Stenopelmatus cahuilaensis*	Coachella Valley jerusalem cricket	None/None	Inhabits a small segment of the sand and dune areas of the Coachella Valley, in the vicinity of Palm Springs	Not expected to occur. No suitable vegetation present.

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APPENDIX D

Wetland Data Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Camp Ronald McDonald for Good Times | City/County: Riverside | Sampling Date: 03/02/17

Applicant/Owner: Camp Ronald McDonald for Good Times | State: CA | Sampling Point: AT4-P1

Investigator(s): R. Henry; K. Mullen | Section, Township, Range: S4, T6S, R3E

Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): linear | Slope (%): 1

Subregion (LRR): C - Mediterranean California | Lat: 33.677012 | Long: -116.673082 | Datum: NAD83

Soil Map Unit Name: Oak glen-rush families complex, 2 to 15 percent slopes (OmD) | NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ○ No ◉

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: Region has experienced seasonally high precipitation (19.24 inches) and snow fall (54.9 inches) from Sept to Mar, which have resulted in excessive and prolonged surface flows within onsite drainages. Additionally, the 2013 Mountain Fire affected the upper watershed and resulted in several inches of debris flow sediment being deposited within local drainages.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pin pon*	30	Yes	Not Listed
2.			
3.			
4.			
Total Cover:	30 %		
Sapling/Shrub Stratum			
1. *Sal las*	50	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	50 %		
Herb Stratum			
1. *Cyn dac*	40	Yes	Not Listed
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	40 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 30 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	50	x 2 =	100
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	70	x 5 =	350
Column Totals:	120	(A)	450 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: Approximately 1-foot surface water flowing within OHWM. Vegetation limited to adjacent stream terrace and upland areas. Plant identification of other species difficult due to stream scour and lack of leaves/flowering parts.

SOIL

Sampling Point: AT4-P1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	10YR 2/1	100	N/A	N/A			Loam	Mountain Fire debris flow
8-16	10YR 3/3	100	N/A	N/A			Loamy sand	Medium-fine grained sizes

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Soil pit excavated in stream terrace. Upland areas distinct due to gradient and vegetation community changes. Approximately 4 inches of water in soil pit. Soil profile shows evidence of historic debris flow resulting in abnormally low chroma values in upper strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ◉	No ○	Depth (inches): 1
Water Table Present?	Yes ○	No ○	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches): 4

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Approximately 1 inch of surface water present and flowing within OHWM.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Camp Ronald McDonald for Good Times City/County: Riverside Sampling Date: 03/02/17

Applicant/Owner: Camp Ronald McDonald for Good Times State: CA Sampling Point: ACT4-P2

Investigator(s): R. Henry; K. Mullen Section, Township, Range: S4, T6S, R3E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): linear Slope (%): 1

Subregion (LRR): C - Mediterranean California Lat: 33.677148 Long: -116.672822 Datum: NAD83

Soil Map Unit Name: Oak glen-rush families complex, 2 to 15 percent slopes (OmD) NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ◉ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉
Hydric Soil Present?	Yes ○	No ◉
Wetland Hydrology Present?	Yes ○	No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks: Region has experienced seasonally high precipitation (19.24 inches) and snow fall (54.9 inches) from Sept to Mar, which have resulted in excessive and prolonged surface flows within onsite drainages. Additionally, the 2013 Mountain Fire affected the upper watershed and resulted in several inches of debris flow sediment being deposited within local drainages.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pin pon*	50	Yes	Not Listed
2.			
3.			
4.			
Total Cover:	50 %		
Sapling/Shrub Stratum			
1. *Art tri*	1	No	Not Listed
2.			
3.			
4.			
5.			
Total Cover:	1 %		
Herb Stratum			
1. *Bra nig*	40	Yes	Not Listed
2. *Ero cic*	40	Yes	Not Listed
3. *Bro sp.*	20	No	Not Listed
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 0 % % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	151	x 5 =	755
Column Totals:	151 (A)		755 (B)

Prevalence Index = B/A = 5.00

Hydrophytic Vegetation Indicators:

- ○ Dominance Test is >50%
- ○ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: Data station established in uplands within lower montane coniferous forest community approximately 90 feet east of OHWM.

SOIL

Sampling Point: ACT4-P2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	10YR 3/2	100	N/A	N/A			Loam	
4-5	10YR 2/1	100	N/A	N/A			Clay loam	thin organic layer-needles-roots
6-11	10YR 3/3	100	N/A	N/A			Loam	
11-16	10YR 3/3	100	N/A	N/A			Loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks: Soil pit excavated in upland area to confirm deposition of debris flows within riparian community. Upland area distinct due to gradient and vegetation community changes.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Camp Ronald McDonald for Good Times | City/County: Riverside | Sampling Date: 03/02/17
Applicant/Owner: Camp Ronald McDonald for Good Times | State: CA | Sampling Point: AT1-P1
Investigator(s): R. Henry; K. Mullen | Section, Township, Range: S4, T6S, R3E
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): linear | Slope (%): 1
Subregion (LRR): C - Mediterranean California | Lat: 33.680592 | Long: -116.673760 | Datum: NAD83
Soil Map Unit Name: Oak glen-rush families complex, 2 to 15 percent slopes (OmD) | NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ( ) No (•) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [X] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (•)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	(•)	( )
Hydric Soil Present?	( )	(•)
Wetland Hydrology Present?	(•)	( )

Is the Sampled Area within a Wetland? Yes ( ) No (•)

Remarks: Region has experienced seasonally high precipitation (19.24 inches) and snow fall (54.9 inches) from Sept to Mar, which have resulted in excessive and prolonged surface flows within onsite drainages. Additionally, the 2013 Mountain Fire affected the upper watershed and resulted in several inches of debris flow sediment being deposited within local drainages.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pin pon*	2	No	Not Listed
2.			
3.			
4.			
Total Cover:	2 %		
Sapling/Shrub Stratum			
1. *Sal las*	40	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	40 %		
Herb Stratum			
1. *Cyn dac*	60	Yes	Not Listed
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	40	x 2 =	80
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species	62	x 5 =	310
Column Totals:	102 (A)		390 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

- [ ] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: Approximately 1-foot surface water flowing within OHWM. Vegetation limited to adjacent stream terrace and upland areas. Plant identification of other species difficult due to stream scour and lack of leaves/flowering parts.

SOIL

Sampling Point: AT1-P1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	10YR 2/1	100	N/A	N/A			Loam	Mountain Fire debris flow
8-16	10YR 3/3	100	N/A	N/A			Loamy sand	Medium-fine grained sizes

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? **Yes** ○ **No** ●

Remarks: Soil pit excavated in stream terrace. Upland areas distinct due to gradient and vegetation community changes. Approximately 4 inches of water in soil pit. Soil profile shows evidence of historic debris flow resulting in abnormally low chroma values in upper strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [x] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Plowed Soils (C6)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [x] Drift Deposits (B3) (**Riverine**)
- [x] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Thin Muck Surface (C7)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?	●	○	1
Water Table Present?	○	○	
Saturation Present? (includes capillary fringe)	●	○	4

Wetland Hydrology Present? **Yes** ● **No** ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Approximately 1 inch of surface water present and flowing within OHWM.

DUDEK

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MEMORANDUM

To:	Brian Crater, *Camp Ronald McDonald for Good Times*
From:	Ian McIntire / Jennifer Reed, *Dudek*
Subject:	Camp Ronald McDonald for Good Times Greenhouse Gas Emissions Assessment
Date:	March 24, 2017
cc:	Collin Ramsey, *Dudek*
Attachment(s):	Appendix A – CalEEMod Modeling Output

Dudek is pleased to submit this greenhouse gas (GHG) emissions assessment for the Camp Ronald McDonald for Good Times construction project (project) located in Riverside County (County) to assist with environmental planning requirements. This memorandum estimates GHG emissions from construction of the project and evaluates associated potential GHG emissions environmental impacts. Since the proposed project would not increase capacity, but rather improve existing facilities, operational emissions would be similar to existing levels and associated operational impacts are qualitatively discussed.

The contents and organization of this memorandum are as follows: 1) project description and background; 2) general analysis and methodology, including construction assumptions; 3) GHG emissions assessment; 4) conclusions; and 5) references cited.

1 PROJECT DESCRIPTION AND BACKGROUND

The applicant proposes to construct new buildings and facilities on the approximately 59.14-acre campground within an unincorporated portion of Riverside County near the community of Idyllwild. The project would demolish approximately 21,165 square feet of the existing 45,691 square feet of structures on-site and would construct replacement facilities totaling approximately 31,201 square feet.

The proposed facility improvements would not result in an increase in the number of visitors served by the camp or camp staff. Rather, the proposed project would provide necessary improvements to serve the needs of the existing camp activities and provide modernized facilities for the campers and their families.

2 GENERAL ANALYSIS AND METHODOLOGY

2.1 Greenhouse Gases and Climate Change Overview

The project site is located within the South Coast Air Basin (SCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAB is characterized as having a Mediterranean climate (typified as semiarid with mild winters, warm summers, and moderate rainfall).

GHGs are gases that absorb infrared radiation in the atmosphere. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise. Globally, climate change has the potential to impact numerous environmental resources though uncertain impacts related to future air temperatures and precipitation patterns. Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. Climate change is already affecting California: average temperatures have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

Principal GHGs, which are estimated in this analysis, include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).[1] The effect each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP), which varies among GHGs. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalent (CO_2E).The current version of the California Emissions Estimator Model (CalEEMod) (version 2016.3.1) assumes that the GWP for CH_4 is 25 (so emissions of 1 MT of CH_4 are equivalent to emissions of 25 MT of CO_2), and the GWP for N_2O is 298, based on the IPCC

[1] California Health and Safety Code, Section 38505, identifies seven GHGs that the California Air Resources Board is responsible to monitor and regulate to reduce emissions: CO_2, CH_4, N_2O, sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF_3). CalEEMod calculates project-generated emissions of CO_2, CH_4, and N_2O, which is what is presented in this analysis. Furthermore, construction of the project would not include activities would generate emissions of fluorinated gases.

Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the project.

Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs (CAT 2010). This approach is consistent with the *Final Statement of Reasons for Regulatory Action* for amendments to the California Environmental Quality Act (CEQA) Guidelines, which confirms that an environmental impact report or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable (CNRA 2009).

2.2 Construction Assumptions

GHG emissions associated with construction of the proposed project were estimated for the following emission sources: operation of off-road construction equipment, on-road vendor and haul trucks, and worker vehicles.

CalEEMod version 2016.3.1 was used to estimate project-generated construction emissions. For purposes of estimating project emissions, and based on information provided by the applicant and CalEEMod default values, it is assumed that construction of the project would commence in January 2018 and would last approximately 11 months, ending in November 2018[2]. Demolition of 21,165 square feet of existing structures would take approximately 20 days. Site preparation, which includes clearing and grubbing activities, would take approximately 2 days, followed by grading, which would occur over 4 days. Construction of the new camp facilities would take approximately 200 days, while application of architectural coatings would take approximately 10 days.

In summary, the analysis contained herein is based on the following assumptions (duration of phases is approximate):

- Demolition – 20 days (January 2018)
- Site Preparation – 2 days (January 2018)
- Grading– 4 days (February 2018)
- Building Construction – 200 days (February 2018 – November 2018)

[2] The construction schedule assumed in the CalEEMod modeling represents a compressed, and thus, conservative or "worst-case" construction timeframe. Realistically, project construction is largely dependent on the availability of funding and would be phased over several years.

- Application of Architectural Coatings – 10 days (November 2018)

The construction equipment mix used for estimating the construction emissions of the project is based on information provided by the applicant and is shown in Table 1, Construction Scenario Assumptions. For this analysis, it was assumed that heavy construction equipment will operate 5 days a week during project construction.

Table 1
Construction Scenario Assumptions

Construction Phase	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Type*	*Quantity*	*Usage Hours*
Demolition	14	0	96	Concrete/Industrial Saws	1	8
				Rubber Tired Dozers	1	8
				Tractors/Loaders/Backhoes	3	8
Site Preparation	8	0	0	Graders	1	8
				Rubber Tired Dozers	1	7
				Tractors/Loaders/Backhoes	1	8
Grading	8	0	0	Graders	1	6
				Rubber Tired Dozers	1	6
				Tractors/Loaders/Backhoes	1	7
Building Construction	156	26	0	Cranes	1	6
				Forklifts	1	6
				Generator Sets	1	8
				Tractors/Loaders/Backhoes	1	6
				Welders	3	8
Architectural Coating	32	0	0	Air Compressors	1	6

Notes: See Attachments A for details.

3 GREENHOUSE GAS EMISSIONS ASSESSMENT

3.1 Thresholds of Significance

The significance criteria used to evaluate the project's GHG emissions impacts incorporate recommendations provided in Appendix G of the CEQA Guidelines.[3] The following questions from Appendix G were evaluated to help assess if the project would result in a significant impact on climate change:

a. Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

b. Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

In evaluating GHG related impacts, and in exercising the County's independent lead agency discretion to define a significance threshold applicable to this project, the criteria outlined in the County's Climate Action Plan (CAP) was applied to the project. Per the CAP, each new project within the County subject to CEQA would require to meet one of the following criteria:

- Projects below the screening threshold of 3,000 metric tons of carbon dioxide equivalent (MT CO_2E) per year for GHGs are determined to be less than significant and no further GHG analysis would be required, or
- Projects that exceed the screening threshold are able to tier from the GHG analysis associated with the CAP by accumulating 100 points from the Screening Tables in Appendix F of the CAP.

Estimated project-generated construction emissions from the project were amortized over the life of the project, which is assumed to be 30 years, and then compared to the CAP threshold of 3,000 MT CO_2E per year, consistent with SCAQMD guidance on assessing construction GHG emissions.[4]

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[3] The CEQA Guidelines do not prescribe specific methodologies for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methodologies and thresholds of significance consistent with the manner in which other impact areas are handled in CEQA (CNRA 2009).

[4] The SCAQMD *Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold* (2009) recommends that "construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies."

3.2 Impact Analysis

3.2.1 Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The proposed project is located in the unincorporated area of Riverside County, which has an adopted CAP. The County's CAP includes GHG inventories of community-wide and municipal sources based on the most recent data available for the year 2008. As provided in the County's CAP, projects that exceed a screening threshold of 3,000 MT CO_2E are required to garner at least 100 points worth of reduction quantities from the Screening Tables in Appendix F of the CAP in order to determine a project's consistency with the County's GHG Technical Report.

Construction Greenhouse Gas Emissions Analysis

Construction of the proposed project would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. The County has not proposed or adopted relevant quantitative GHG thresholds for construction-generated emissions. Nonetheless, amortized GHG emissions generated during construction of the proposed project are included in this assessment for disclosure purposes.

CalEEMod was used to calculate the annual GHG emissions based on the construction scenario. Construction of the proposed project was assumed to commence in January 2018 and reach completion in November 2018, lasting a total of 11 months. Construction would involve demolition of about 21,165 square-feet of existing structures, clearing and grubbing, and grading of the site. The proposed earthwork would not require import or export of soils.

Standard construction methods would be employed for building construction. Sources of emissions would include: off-road construction equipment exhaust, on-road vehicles exhaust and entrained road dust (i.e., demolition trucks, material delivery trucks, and worker vehicles), fugitive dust associated with site preparation and grading activities, and paving and architectural coating activities. Table 2 presents construction emissions for the proposed project in 2018 from on-site and off-site emission sources. Detailed assumptions associated with project construction are included as an attachment to this memorandum.

Table 2
Estimated Annual Construction Greenhouse Gas Emissions

Year	CO_2	CH_4	N_2O	CO_2E
	metric tons per year			
2018	495.35	0.06	0.00	496.75

Notes: See Appendix A for detailed results.
CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2E = carbon dioxide equivalent

As shown in Table 2, the estimated total GHG emissions during construction of would be approximately 497 MT CO_2E. Estimated project-generated construction emissions amortized over a 30-year period would be approximately 17 MT CO_2E per year. GHG emissions generated during construction of the proposed project would be short-term in nature, lasting only for the duration of the construction period and would not represent a long-term source of GHG emissions.

Operational Greenhouse Gas Emissions Analysis

Currently, Camp Ronald McDonald for Good Times sees a total of approximately 3,534 persons throughout the year including campers and families, volunteer staffing, and employees. As discussed previously, proposed updates to the camp include the demolition of the outdated structures and construction of updated facilities to replace the demolished structures. The proposed facility improvements would not result in an increase in the number of visitors served by the camp or camp staff. Rather, the proposed project would provide necessary improvements to serve the needs of the existing camp activities and provide modernized facilities for the campers and their families. The proposed project would result in a minimal change to existing trips to the project site; therefore, it would be reasonable to assume that the proposed updates would not substantially increase the camp's existing operational GHG emissions related to mobile sources, which are typically the primary source of GHG emissions from land use development.

In regards to non-mobile source emissions, newer facilities constructed at the camp may result in less GHG emissions per square foot as the new buildings would be more energy efficient as they would be constructed in accordance with, at minimum, the most recent adopted California Energy Code (Part 6, Title 24, California Code of Regulations) and Riverside County Ordinances. Furthermore, indoor and outdoor water consumption and wastewater generation is anticipated to be the same as the existing buildings because the proposed project would continue to serve the same number of visitors and staff. Accordingly, electricity consumption associated with water supply, treatment, and distribution and wastewater treatment would be similar to the existing electricity required to provide such water and wastewater services. GHG emissions associated with solid waste generation would also be similar to existing solid waste generation as the proposed project would accommodate the same amount of visitors and staffs.

As discussed previously, amortized construction GHG emissions resulting from proposed improvements made to the camp are anticipated to be approximately 17 MT CO_2E per year which would not exceed the County's threshold of 3,000 MT CO_2E per year. As such, operation of the proposed project would not result in a substantial increase of long-term GHG emissions, potential GHG impacts of the proposed project would be less than significant and the proposed project's contribution to climate change would not be cumulatively considerable. Therefore, the proposed project would be have a less than significant individual and cumulative impact for GHG emissions and would not require further analysis regarding utilizing the CAP's Screening Tables.

3.2.2 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As previously discussed, operational project-specific GHG quantification was not provided because the proposed updates would result a minimal change to the camp's existing operational GHG emissions. However, the proposed project would result in amortized construction GHG emissions of approximately 17 MT CO_2E, which would be significantly below the County's threshold of 3,000 MT CO_2E. Because the proposed project would result GHG emissions substantially less than the County's threshold, it would be consistent with the County's CAP.

Regarding consistency with Senate Bill (SB) 32 (goal of reducing GHG emissions to 40% below 1990 levels by 2030) and Executive Order S-3-05 (goal of reducing GHG emissions to 80% below 1990 levels by 2050), there are no established protocols or thresholds of significance for that future-year analysis. However, CARB forecasts that compliance with the Scoping Plan puts the state on a trajectory of meeting these long-term GHG goals, although the specific path to compliance is unknown (CARB 2014). The draft Second Update to the Scoping Plan reaffirmed that the state is on the path toward achieving these long-term goals, by continuing the cap and trade program until 2030 and requiring a 20% reduction in refinery emissions (CARB 2017). As discussed previously, the proposed project would result in minimal GHG emissions associated with construction of the proposed updates while operational GHG emissions would not result in a substantial change compared with existing conditions. Therefore, the proposed project's GHG emissions were estimated to be well below the County's threshold, thus not conflicting with the state's trajectory toward future GHG reductions. In addition, since the specific path to compliance for the state in regards to the long-term goals will likely require development of technology or other changes that are not currently known or available, specific additional mitigation measures for the proposed project would be speculative and cannot be identified at this time. With respect to future GHG targets under SB 32 and Executive Order S-3-05, CARB has also made clear its legal interpretation that it has the requisite authority to adopt whatever regulations are necessary, beyond the AB 32 horizon year of 2020, to meet the reduction targets in 2030 and in 2050; this legal interpretation by an expert agency provides evidence that future regulations will be adopted to continue the state on its trajectory toward meeting these future GHG targets.

Based on the preceding considerations, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be less than significant.

4 CONCLUSIONS

The proposed project's potential effect on global climate change was evaluated, and emissions of GHGs were estimated based on the use of construction equipment and vehicle trips associated with construction activities. Estimated total GHG emissions generated during construction would be 497 MT CO_2E resulting in amortized (over a 30-year period) GHG emissions of 17 MT CO_2E. Operational GHG emissions associated with the proposed project were not determined to result in a substantial change to the existing camp's operational GHG emissions, the primary source of operational GHG emissions are attributed to mobile sources, which would not increase as a result of the proposed project. Therefore, the proposed project's GHG emissions would be substantially below the County's significance threshold of 3,000 MT CO_2E. Impacts associated with project-generated GHG emissions would be less than significant.

5 REFERENCES

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APPENDIX A

CalEEMod Model Output

Camp Ronald McDonald

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	205.00	Dwelling Unit	1.19	51,816.00	205
User Defined Recreational	1.00	User Defined Unit	0.47	20,361.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2019
Utility Company	Riverside Public Utilities				
CO2 Intensity (lb/MWhr)	1325.65	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Camp Ronald McDonald. Riverside County (SCAB).

Land Use - The proposed project would construct 51,816 square feet of short-term housing (205 beds) and 20,361 square feet of recreational facilities.

Construction Phase - Construction assumed to occur from Jan 2018 to Nov 2018.

Off-road Equipment -

Grading -

Demolition - Demolition of 21,165 square feet of existing facilities.

Trips and VMT - Rounded trips.

Area Coating - Defaults.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Parking	100.00	0.00
tblAreaCoating	Area_EF_Parking	100	0
tblConstructionPhase	PhaseEndDate	12/10/2018	11/26/2018
tblConstructionPhase	PhaseStartDate	11/27/2018	11/13/2018
tblLandUse	BuildingSpaceSquareFeet	205,000.00	51,816.00
tblLandUse	BuildingSpaceSquareFeet	0.00	20,361.00
tblLandUse	LandUseSquareFeet	205,000.00	51,816.00
tblLandUse	LandUseSquareFeet	0.00	20,361.00
tblLandUse	LotAcreage	12.81	1.19
tblLandUse	LotAcreage	0.00	0.47
tblLandUse	Population	586.00	205.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	VendorTripNumber	25.00	26.00
tblTripsAndVMT	WorkerTripNumber	31.00	32.00
tblTripsAndVMT	WorkerTripNumber	13.00	14.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.6665	2.4904	2.5164	5.6000e-003	0.2814	0.1280	0.4094	0.0778	0.1230	0.2008	0.0000	495.3476	495.3476	0.0562	0.0000	496.7513
Maximum	**0.6665**	**2.4904**	**2.5164**	**5.6000e-003**	**0.2814**	**0.1280**	**0.4094**	**0.0778**	**0.1230**	**0.2008**	**0.0000**	**495.3476**	**495.3476**	**0.0562**	**0.0000**	**496.7513**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.6665	2.4904	2.5164	5.6000e-003	0.2814	0.1280	0.4094	0.0778	0.1230	0.2008	0.0000	495.3474	495.3474	0.0562	0.0000	496.7511
Maximum	**0.6665**	**2.4904**	**2.5164**	**5.6000e-003**	**0.2814**	**0.1280**	**0.4094**	**0.0778**	**0.1230**	**0.2008**	**0.0000**	**495.3474**	**495.3474**	**0.0562**	**0.0000**	**496.7511**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2018	1/26/2018	5	20	
2	Site Preparation	Site Preparation	1/27/2018	1/30/2018	5	2	
3	Grading	Grading	1/31/2018	2/5/2018	5	4	
4	Building Construction	Building Construction	2/6/2018	11/12/2018	5	200	
5	Architectural Coating	Architectural Coating	11/13/2018	11/26/2018	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 0

Residential Indoor: 104,927; Residential Outdoor: 34,976; Non-Residential Indoor: 30,542; Non-Residential Outdoor: 10,181; Striped

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	32.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	156.00	26.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	5	14.00	0.00	96.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	19.80	7.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0105	0.0000	0.0105	1.5900e-003	0.0000	1.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0248	0.2436	0.1511	2.4000e-004		0.0144	0.0144		0.0134	0.0134	0.0000	21.6923	21.6923	5.5000e-003	0.0000	21.8297
Total	**0.0248**	**0.2436**	**0.1511**	**2.4000e-004**	**0.0105**	**0.0144**	**0.0248**	**1.5900e-003**	**0.0134**	**0.0150**	**0.0000**	**21.6923**	**21.6923**	**5.5000e-003**	**0.0000**	**21.8297**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9000e-004	0.0134	1.6300e-003	4.0000e-005	8.3000e-004	5.0000e-005	8.8000e-004	2.3000e-004	5.0000e-005	2.7000e-004	0.0000	3.5487	3.5487	2.4000e-004	0.0000	3.5546
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	7.5000e-004	7.7000e-003	2.0000e-005	2.0700e-003	1.0000e-005	2.0900e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.8368	1.8368	5.0000e-005	0.0000	1.8381
Total	**1.2500e-003**	**0.0142**	**9.3300e-003**	**6.0000e-005**	**2.9000e-003**	**6.0000e-005**	**2.9700e-003**	**7.8000e-004**	**6.0000e-005**	**8.3000e-004**	**0.0000**	**5.3855**	**5.3855**	**2.9000e-004**	**0.0000**	**5.3927**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0105	0.0000	0.0105	1.5900e-003	0.0000	1.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0248	0.2436	0.1511	2.4000e-004		0.0144	0.0144		0.0134	0.0134	0.0000	21.6923	21.6923	5.5000e-003	0.0000	21.8297
Total	**0.0248**	**0.2436**	**0.1511**	**2.4000e-004**	**0.0105**	**0.0144**	**0.0248**	**1.5900e-003**	**0.0134**	**0.0150**	**0.0000**	**21.6923**	**21.6923**	**5.5000e-003**	**0.0000**	**21.8297**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.9000e-004	0.0134	1.6300e-003	4.0000e-005	8.3000e-004	5.0000e-005	8.8000e-004	2.3000e-004	5.0000e-005	2.7000e-004	0.0000	3.5487	3.5487	2.4000e-004	0.0000	3.5546
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	7.5000e-004	7.7000e-003	2.0000e-005	2.0700e-003	1.0000e-005	2.0900e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.8368	1.8368	5.0000e-005	0.0000	1.8381
Total	**1.2500e-003**	**0.0142**	**9.3300e-003**	**6.0000e-005**	**2.9000e-003**	**6.0000e-005**	**2.9700e-003**	**7.8000e-004**	**6.0000e-005**	**8.3000e-004**	**0.0000**	**5.3855**	**5.3855**	**2.9000e-004**	**0.0000**	**5.3927**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0208	8.0800e-003	2.0000e-005		9.5000e-004	9.5000e-004		8.8000e-004	8.8000e-004	0.0000	1.5743	1.5743	4.9000e-004	0.0000	1.5866
Total	**1.8100e-003**	**0.0208**	**8.0800e-003**	**2.0000e-005**	**5.8000e-003**	**9.5000e-004**	**6.7500e-003**	**2.9500e-003**	**8.8000e-004**	**3.8300e-003**	**0.0000**	**1.5743**	**1.5743**	**4.9000e-004**	**0.0000**	**1.5866**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	4.0000e-005	4.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1050	0.1050	0.0000	0.0000	0.1050
Total	**5.0000e-005**	**4.0000e-005**	**4.4000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1050**	**0.1050**	**0.0000**	**0.0000**	**0.1050**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0208	8.0800e-003	2.0000e-005		9.5000e-004	9.5000e-004		8.8000e-004	8.8000e-004	0.0000	1.5743	1.5743	4.9000e-004	0.0000	1.5866
Total	**1.8100e-003**	**0.0208**	**8.0800e-003**	**2.0000e-005**	**5.8000e-003**	**9.5000e-004**	**6.7500e-003**	**2.9500e-003**	**8.8000e-004**	**3.8300e-003**	**0.0000**	**1.5743**	**1.5743**	**4.9000e-004**	**0.0000**	**1.5866**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	4.0000e-005	4.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1050	0.1050	0.0000	0.0000	0.1050
Total	**5.0000e-005**	**4.0000e-005**	**4.4000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.1050**	**0.1050**	**0.0000**	**0.0000**	**0.1050**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0341	0.0135	3.0000e-005		1.5900e-003	1.5900e-003		1.4600e-003	1.4600e-003	0.0000	2.5787	2.5787	8.0000e-004	0.0000	2.5988
Total	**2.9900e-003**	**0.0341**	**0.0135**	**3.0000e-005**	**9.8300e-003**	**1.5900e-003**	**0.0114**	**5.0500e-003**	**1.4600e-003**	**6.5100e-003**	**0.0000**	**2.5787**	**2.5787**	**8.0000e-004**	**0.0000**	**2.5988**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	9.0000e-005	8.8000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2099	0.2099	1.0000e-005	0.0000	0.2101
Total	**1.1000e-004**	**9.0000e-005**	**8.8000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2099**	**0.2099**	**1.0000e-005**	**0.0000**	**0.2101**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.8300e-003	0.0000	9.8300e-003	5.0500e-003	0.0000	5.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0341	0.0135	3.0000e-005		1.5900e-003	1.5900e-003		1.4600e-003	1.4600e-003	0.0000	2.5787	2.5787	8.0000e-004	0.0000	2.5988
Total	**2.9900e-003**	**0.0341**	**0.0135**	**3.0000e-005**	**9.8300e-003**	**1.5900e-003**	**0.0114**	**5.0500e-003**	**1.4600e-003**	**6.5100e-003**	**0.0000**	**2.5787**	**2.5787**	**8.0000e-004**	**0.0000**	**2.5988**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-004	9.0000e-005	8.8000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2099	0.2099	1.0000e-005	0.0000	0.2101
Total	**1.1000e-004**	**9.0000e-005**	**8.8000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2099**	**0.2099**	**1.0000e-005**	**0.0000**	**0.2101**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2592	1.7428	1.3877	2.2000e-003		0.1058	0.1058		0.1022	0.1022	0.0000	184.2346	184.2346	0.0371	0.0000	185.1618
Total	**0.2592**	**1.7428**	**1.3877**	**2.2000e-003**		**0.1058**	**0.1058**		**0.1022**	**0.1022**	**0.0000**	**184.2346**	**184.2346**	**0.0371**	**0.0000**	**185.1618**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0104	0.3400	0.0691	7.5000e-004	0.0188	3.0300e-003	0.0218	5.4200e-003	2.9000e-003	8.3200e-003	0.0000	71.5206	71.5206	5.8100e-003	0.0000	71.6658
Worker	0.1068	0.0839	0.8582	2.2700e-003	0.2309	1.4300e-003	0.2323	0.0613	1.3200e-003	0.0626	0.0000	204.6710	204.6710	5.9800e-003	0.0000	204.8205
Total	**0.1172**	**0.4239**	**0.9273**	**3.0200e-003**	**0.2497**	**4.4600e-003**	**0.2542**	**0.0667**	**4.2200e-003**	**0.0710**	**0.0000**	**276.1916**	**276.1916**	**0.0118**	**0.0000**	**276.4863**

Mitigated Construction On-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Off-Road	0.2592	1.7428	1.3877	2.2000e-003		0.1058	0.1058		0.1022	0.1022	0.0000	184.2344	184.2344	0.0371	0.0000	185.1616
Total	**0.2592**	**1.7428**	**1.3877**	**2.2000e-003**		**0.1058**	**0.1058**		**0.1022**	**0.1022**	**0.0000**	**184.2344**	**184.2344**	**0.0371**	**0.0000**	**185.1616**

Mitigated Construction Off-Site

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0104	0.3400	0.0691	7.5000e-004	0.0188	3.0300e-003	0.0218	5.4200e-003	2.9000e-003	8.3200e-003	0.0000	71.5206	71.5206	5.8100e-003	0.0000	71.6658
Worker	0.1068	0.0839	0.8582	2.2700e-003	0.2309	1.4300e-003	0.2323	0.0613	1.3200e-003	0.0626	0.0000	204.6710	204.6710	5.9800e-003	0.0000	204.8205
Total	**0.1172**	**0.4239**	**0.9273**	**3.0200e-003**	**0.2497**	**4.4600e-003**	**0.2542**	**0.0667**	**4.2200e-003**	**0.0710**	**0.0000**	**276.1916**	**276.1916**	**0.0118**	**0.0000**	**276.4863**

3.6 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2565					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4900e-003	0.0100	9.2700e-003	1.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	1.2766	1.2766	1.2000e-004	0.0000	1.2797
Total	**0.2580**	**0.0100**	**9.2700e-003**	**1.0000e-005**		**7.5000e-004**	**7.5000e-004**		**7.5000e-004**	**7.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.2000e-004**	**0.0000**	**1.2797**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	8.6000e-004	8.8000e-003	2.0000e-005	2.3700e-003	1.0000e-005	2.3800e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	2.0992	2.0992	6.0000e-005	0.0000	2.1007
Total	**1.1000e-003**	**8.6000e-004**	**8.8000e-003**	**2.0000e-005**	**2.3700e-003**	**1.0000e-005**	**2.3800e-003**	**6.3000e-004**	**1.0000e-005**	**6.4000e-004**	**0.0000**	**2.0992**	**2.0992**	**6.0000e-005**	**0.0000**	**2.1007**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2565					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4900e-003	0.0100	9.2700e-003	1.0000e-005		7.5000e-004	7.5000e-004		7.5000e-004	7.5000e-004	0.0000	1.2766	1.2766	1.2000e-004	0.0000	1.2797
Total	**0.2580**	**0.0100**	**9.2700e-003**	**1.0000e-005**		**7.5000e-004**	**7.5000e-004**		**7.5000e-004**	**7.5000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.2000e-004**	**0.0000**	**1.2797**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	8.6000e-004	8.8000e-003	2.0000e-005	2.3700e-003	1.0000e-005	2.3800e-003	6.3000e-004	1.0000e-005	6.4000e-004	0.0000	2.0992	2.0992	6.0000e-005	0.0000	2.1007
Total	**1.1000e-003**	**8.6000e-004**	**8.8000e-003**	**2.0000e-005**	**2.3700e-003**	**1.0000e-005**	**2.3800e-003**	**6.3000e-004**	**1.0000e-005**	**6.4000e-004**	**0.0000**	**2.0992**	**2.0992**	**6.0000e-005**	**0.0000**	**2.1007**

GEOTECHNICAL INVESTIGATION
REPORT UPDATE
CAMP RONALD MCDONALD FACILITY
56400 APPLE CANYON ROAD
MOUNTAIN CENTER AREA
RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR:

CAMP RONALD MCDONALD
1954 Cotner Avenue
Los Angeles, California 90025

PREPARED BY:

INLAND FOUNDATION ENGINEERING, INC.
1310 South Santa Fe Avenue
San Jacinto, California 92583

November 13, 2020
Project No. C457-007

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INLAND FOUNDATION ENGINEERING, INC.
Consulting Geotechnical Engineers and Geologists
P.O. Box 937, San Jacinto, California 92581

November 13, 2020
Project No. C457-007

CAMP RONALD MCDONALD FOR GOOD TIMES
1954 Cotner Avenue
Los Angeles, California 90025

Re: Geotechnical Investigation Report Update
Camp Ronald McDonald Facility
56400 Apple Canyon Road
Mountain Center Area, Riverside County, California

Ladies and Gentlemen:

We are pleased to submit this geotechnical investigation report update prepared for the referenced project. The site is located north of Apple Canyon Road, in the Mountain Center area of Riverside County, California.

The proposed development is feasible from a geotechnical engineering standpoint. The primary issues that will require mitigation are related to near-surface groundwater, soil liquefaction, non-uniform soil conditions and potentially loose and disturbed soils near the surface of the site.

We appreciate the opportunity of being of service to you on this project. If there are any questions, please contact our office.

Respectfully,

INLAND FOUNDATION ENGINEERING, INC.

PROFESSIONAL GEOLOGIST DANIEL R. LIND No. 2451 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

Daniel R. Lind, P.G., C.E.G.
Vice President

REGISTERED PROFESSIONAL ENGINEER ALLEN D. EVANS No. 2060 GEOTECHNICAL STATE OF CALIFORNIA

Allen D. Evans, P.E., G.E.
Principal

DRL:ADE:es
Distribution: Addressee

INTRODUCTION

This report presents an updated geotechnical investigation conducted for the Camp Ronald McDonald for Good Times in Mountain Center, California. The subject site occupies about 60± acres and is located near the center portion of Section 4, Township 6 South, Range 3 East, S.B.B.&M at 56400 Apple Canyon Road in the Mountain Center Area of Riverside County, California. The Assessor Parcel Number for the property is 568-070-025. This update report is based on testing and exploration previously conducted by our firm on the subject property, and our current review of existing site conditions. This report provides preliminary design parameters that may be applied to development on the site. The following references were used in the preparation of this report:

- Planning Case Progress Report, Project /Case Information, Case CUP03204R1, dated June 11, 2020, prepared by Riverside County Planning Department.

- Conditional Use Permit, Case #: CUP03204R1, Parcel No. 568-070-025, dated March 25, 2015, prepared by Riverside County Planning Department.

- A report entitled "Geotechnical Exploration, Camp Ronald McDonald Facility 56400 Apple Canyon Road, Mountain Center Area, Riverside County, California", dated April 1, 2010 and prepared Inland Foundation Engineering, Inc.

- A report entitled "Geotechnical Investigation Report Update, Camp Ronald McDonald Facility, 56400 Apple Canyon Road, Mountain Center Area, Riverside County, California", dated May 5, 2017 and prepared Inland Foundation Engineering, Inc.

- Plans entitled "CRM 3204 R1CUP Exhibits 2014", prepared by Andrew Holmquist, P.E.

- A report entitled "Preliminary Geotechnical Exploration Update, Camp Ronald McDonald Facility, 56400 Apple Canyon Road, Mountain Center Area, Riverside County, California", dated May 27, 2008, prepared by Inland Foundation Engineering, Inc.

- A percolation investigation report dated September 11, 2006, entitled "Percolation Investigation, Proposed Camp Improvements, 56400 Apple Canyon Road, Mountain Center Area of Riverside County, California, A.P.N. 568-070-001 & 002", prepared by Inland Foundation Engineering, Inc.

- A geotechnical exploration report dated January 31, 2006, entitled “Preliminary Geotechnical Investigation, Proposed Dining Hall and Administration Facility, Camp Ronald McDonald for Good Times, Mountain Center, California”, prepared by Inland Foundation Engineering, Inc.

- A geotechnical investigation report dated October 19, 1994, entitled “Geotechnical Investigation, Camp Ronald McDonald for Good Times, Garner Valley Area, Riverside County, California”, prepared by Inland Foundation Engineering, Inc.

- A report entitled "Geology and Seismicity Review for Camp Ronald McDonald" dated September 26, 1994, prepared by Lewis S. Lohr & Associates.

- A plan entitled "Preliminary Master Plan for Camp Ronald McDonald for Good Times, Southern California Children's Cancer Services, Inc.", with a revised date of September 26, 1994, prepared by Schmidt Copeland Parker Stevens, Inc.

- A report entitled "Groundwater Investigation, Portion of Assessor's Parcel 568-070-001 & 002" dated June 22, 1994 and prepared by Inland Foundation Engineering, Inc.

- A preliminary soil investigation report dated June 6, 1994, entitled "Geotechnical Investigation, Proposed Infirmary Building, Camp Ronald McDonald for Good Times, Garner Valley Area, Riverside County, California", prepared by Inland Foundation Engineering, Inc.

- A percolation investigation report dated May 26, 1994, entitled "Percolation Investigation, Proposed Infirmary Building, Camp Ronald McDonald for Good Times", prepared by Inland Foundation Engineering, Inc.

- A hydrology and hydraulics report dated April 25, 1994 entitled "Hydrology and Hydraulics Report, Camp Ronald McDonald for Good Times", prepared by Cozad and Thomsen, Inc.

Additional references are appended.

SCOPE OF SERVICE

The purpose of this geotechnical report is to provide updated geotechnical parameters for design and construction of the proposed improvements on the site. The scope of the geotechnical services included:

- *Updated review of 2019 California Building Code (CBC) requirements and the current geologic site conditions.*
- *Evaluation of the engineering and geologic data previously collected for the project site.*
- *Preparation of this report with updated geotechnical conclusions and recommendations for design and construction.*

The tasks performed to achieve these objectives included:

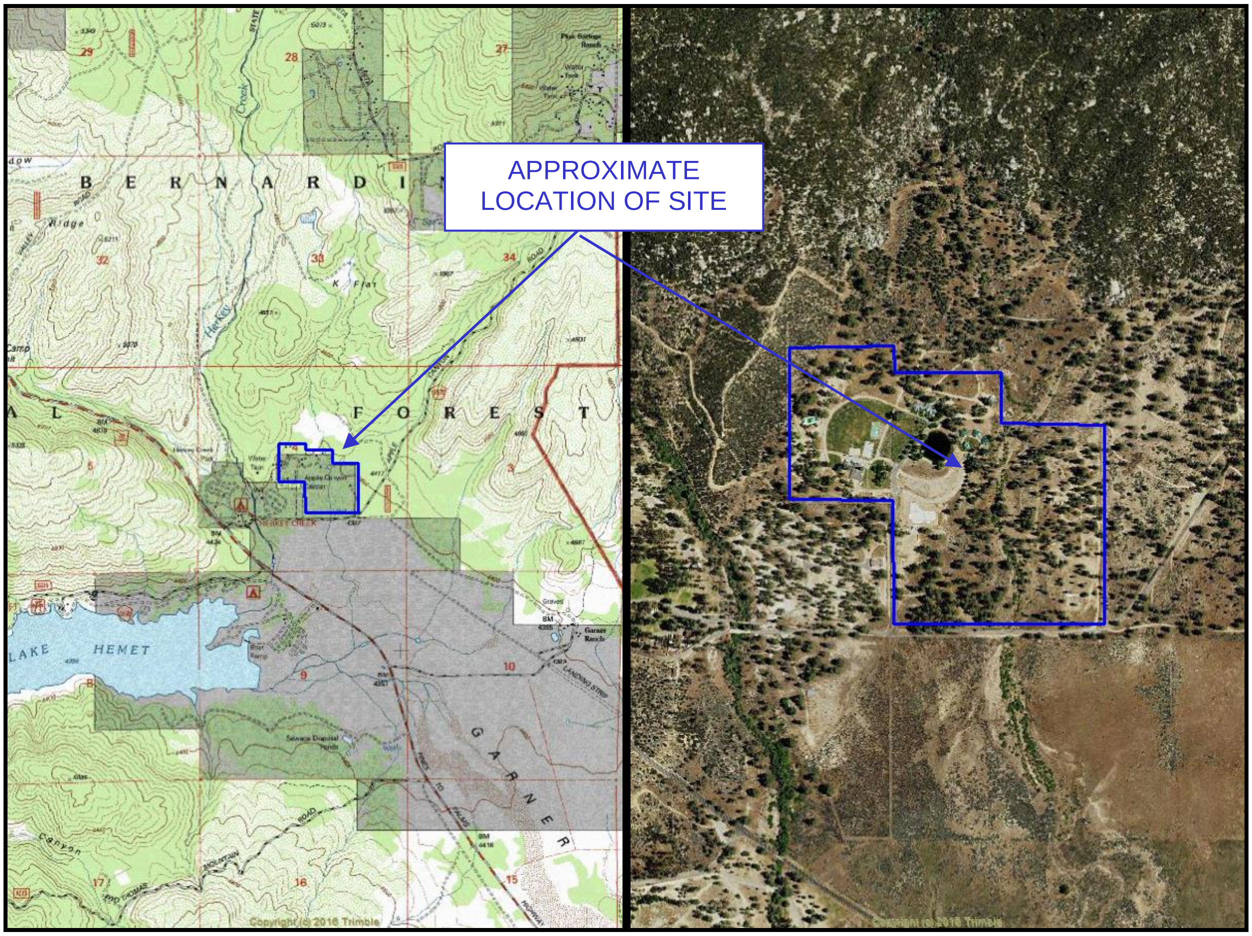
- *Collection and review of new and existing data relative to the site.*
- *Visual reconnaissance of the site and surrounding area to evaluate the presence of unstable or adverse geologic conditions.*
- *Analysis of the data collected and preparation of this report with our updated geotechnical conclusions and recommendations.*

Evaluation of hazardous waste was not within the scope of service provided by this report. The evaluation of seismic hazards was based upon field mapping, literature review and limited subsurface exploration previously conducted at the site. Because the site is not located in a defined active fault zone, a detailed subsurface investigation in this regard was not conducted. The information in this report represents professional opinions that have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No warranty, either expressed or implied, is made as to the professional advice included in this report.

PROJECT DESCRIPTION

The site under consideration occupies about 60± acres and is located north of Apple Canyon Road in the Mountain Center area of Riverside County, California. The site is bounded to the east and north by U.S. Forest Service land, to the west by Hurkey Creek Campground, and to the south by primarily vacant land. The location of the project site is shown on Figure 1 below.

<u>Figure 1</u>: USGS Topographic Map, Idyllwild 7.5' Quadrangle, and Aerial Photograph (2014)



The site is currently used by Camp Ronald McDonald as a camping/retreat facility. Several structures are present on the site, including housing units, offices, a medical facility, storage units, and various meeting and recreation places. A new dining hall and cabin cluster have recently been constructed on the site. The site is generally planar with a gradient to the south. Steeper terrain is present on the far northern region of the site. An intermittent stream is located in the eastern region of the site and drains to the south. Vegetation consists of a moderate growth of seasonal weeds and grasses and scattered pines.

Based on our review of the project documents and discussions with Camp Ronald McDonald, we understand that the proposed improvements under Conditional Use Permit # CUP0304R1 include additional cabin clusters, amphitheater, administration building, entry station, parking areas, pool, pool house, creative/performing arts center and improvements east of the seasonal creek, including staff housing, maintenance building, stables, and nature building. These will be located throughout the facility and will be underlain by various soil conditions. A site plan indicating the existing and proposed improvements is presented in Appendix A.

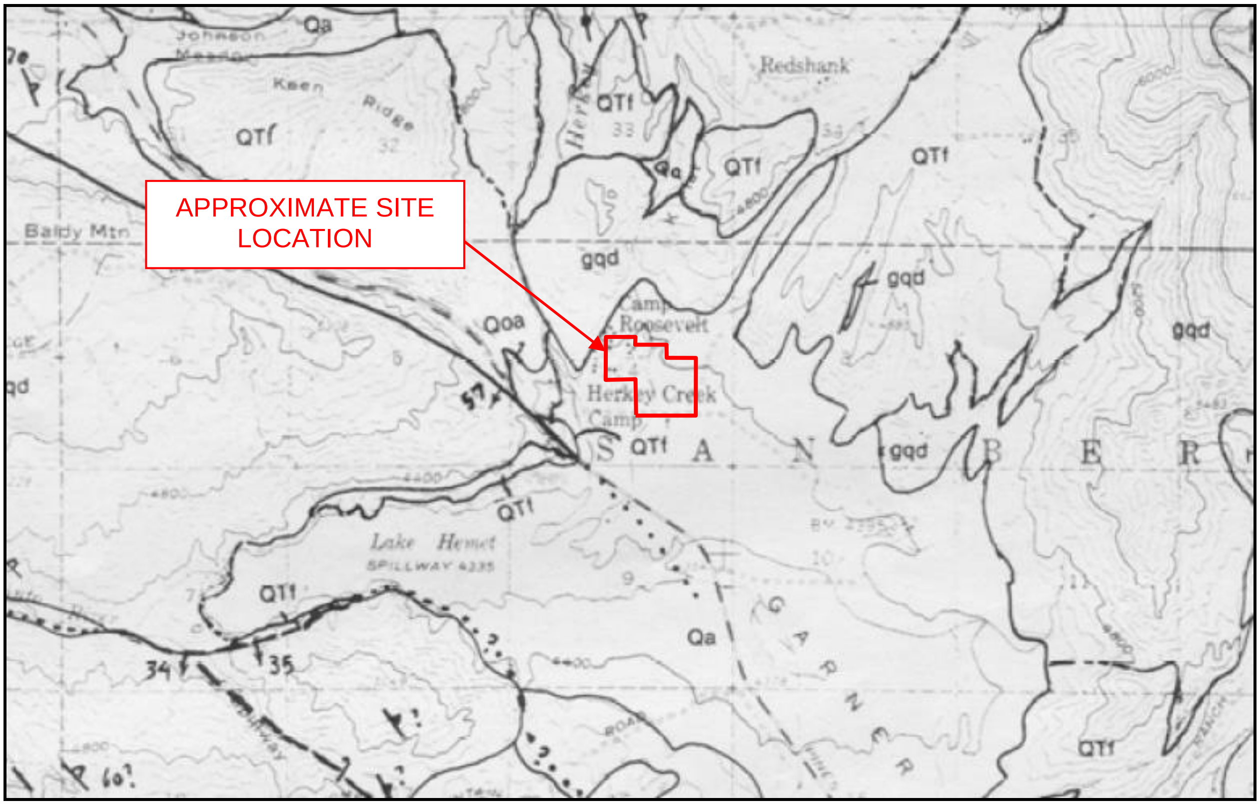
We anticipate that the structures will not exceed two stories in height and will be of wood frame construction primarily supported on continuous wall type footings. Footing loads are assumed to not exceed 3,000 pounds per lineal foot. Information provided from the structural engineer indicates that the period T is less than 0.5 seconds for the planned structures.

GEOLOGIC SETTING

The subject site is situated within a natural geomorphic province in southwestern California known as the Peninsular Ranges, which is characterized by steep, elongated ranges and valleys that trend northwesterly. This province is believed to have originated as a thick accumulation of predominantly marine sedimentary and volcanic rocks during the late Paleozoic and early Mesozoic (pre-batholithic rocks). Following this accumulation, in mid-Cretaceous time, the province underwent a pronounced episode of mountain building. The accumulated rocks were then complexly metamorphosed and intruded by igneous rocks, known locally as the Southern California Batholith. A period of erosion followed the mountain building, and during the late Cretaceous and Cenozoic time, sedimentary and subordinate volcanic rocks were deposited upon the eroded surfaces of the batholithic and pre-batholithic rocks (post-batholithic rocks). Most of these post-batholithic rocks occur along the western and northern portion of the province.

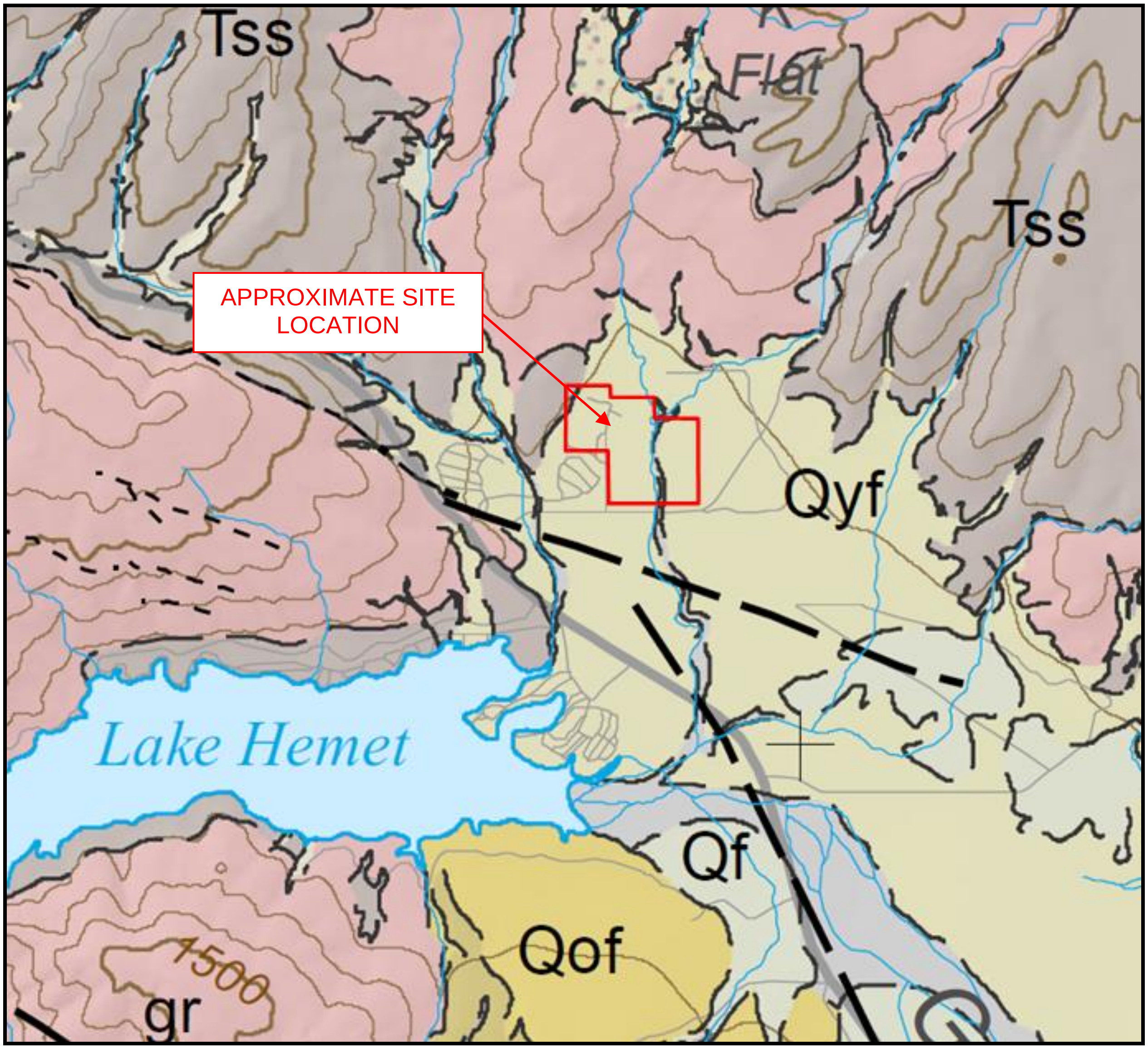
Based on regional geologic mapping by Dibblee (1982) as shown on following Geologic Map, the site is underlain by younger surficial deposits (alluvial sand, gravel, and clay). Figure 2 below shows a portion of the Geologic Map of the Idyllwild 15’ Quadrangle (Dibblee, 1982) depicting the approximate location of the project site.

Figure 2: **Geologic Map of the Idyllwild 15' Quadrangle (Dibblee, 1982)**



Mapping by Lancaster, et al. (2012) indicates that most of the site is underlain by young (Holocene and late Pleistocene) alluvial fan deposits consisting of unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits. Figure 3 below shows a portion of the Preliminary Geologic Map of the Palm Springs 30' x 60' Quadrangle (Lancaster, et al., 2012) showing the mapped geologic units in the vicinity of the project.

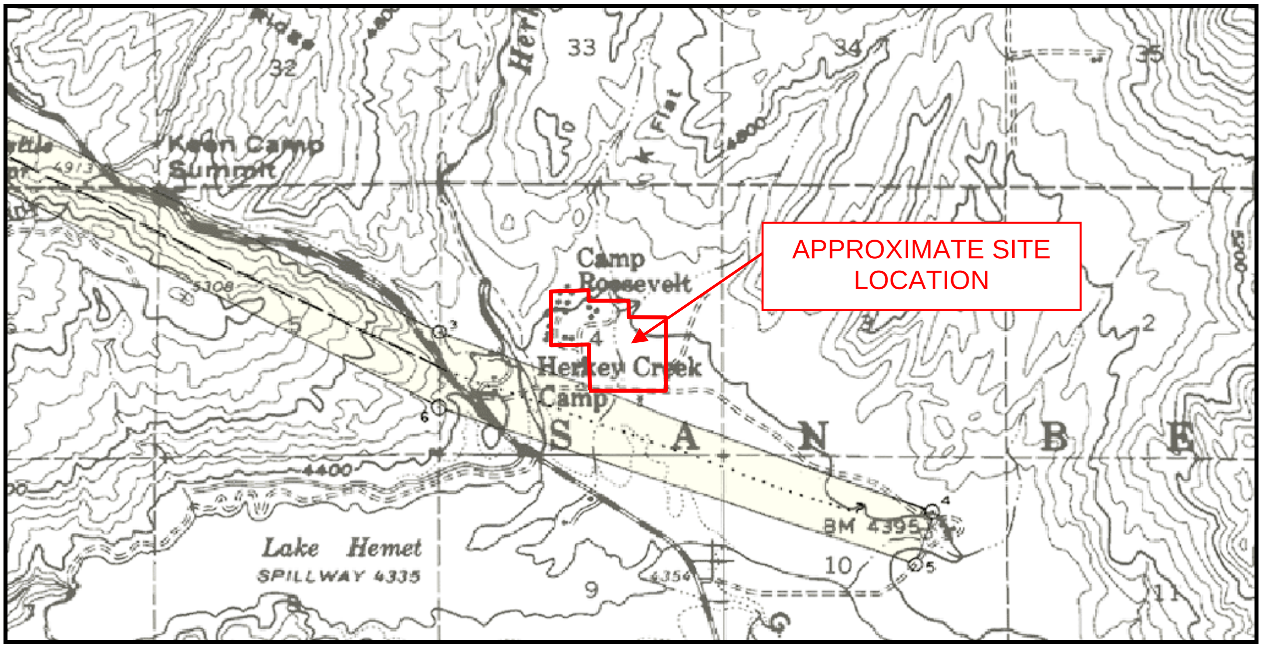
<u>Figure 3</u>: Preliminary Geologic Map of the Palm Springs 30' x 60' Quadrangle (Lancaster, et al., 2012)



Qyf	**Young Alluvial Fan Deposits** - unconsolidated to slightly consolidated, undissected to slightly dissected boulder, cobble, gravel, sand, and silt deposits issued from a confined valley or canyon
Tss	**Coarse-grained Tertiary age formations** - primarily sandstone and conglomerate

Figure 4 below shows a portion of the C.D.M.G. Earthquake Fault Zone Map of the NW ¼ Idyllwild Quadrangle (C.D.M.G., 1974). This map shows that the site is located just outside of a State of California "Alquist-Priolo Earthquake Fault Zone" for fault rupture hazard associated with the Hot Springs Fault. The Hot Springs Fault has been included along with the Buck Ridge Fault to form an offshoot to the San Jacinto Fault Zone and comprises a length of 75 kilometers.

Figure 4: C.D.M.G. Earthquake Fault Zone Map of the NW ¼ Idyllwild Quadrangle (C.D.M.G., 1974)



The Hot Springs Fault, originally named by Fraser (1931), steps eastward off the southeastern extent of the Claremont Fault, approximately 3 km north of the City of Hemet. It is expressed as a zone of faults that can be traced for about 50 km southeast along the mountain front of Garner Valley where the main trace is lost beneath the alluvium. Due to the lateral discontinuity of a single fault segment, and in order to include the large number of secondary faults along the Hot Springs trend, the term "fault zone" is used herein to describe the larger structural zone. A dominant southeast-striking fault can be identified along most of the length of the zone, however, and the name "Hot Springs fault" is applied to this feature (Onderdonk, 2008).

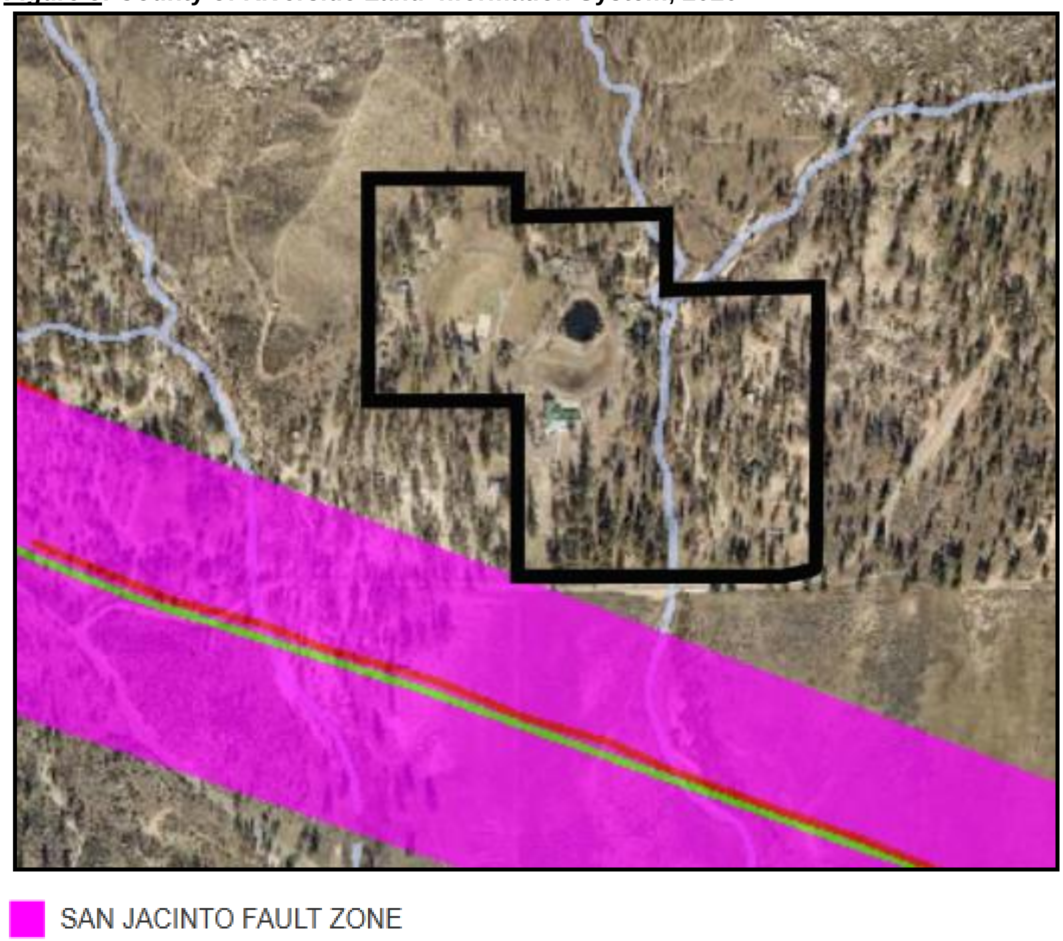
Although the State of California has not evaluated the specific fault characteristics of this zone, the Hot Springs Fault should be considered as having a maximum moment magnitude (M_W) of up to 6.7 and an estimated slip rate of 3.3-5.0± mm/year, primarily based on the length of the fault zone and it's inclusion as an active fault within the State.

Geomorphic expression and seismic activity suggest that although the Hot Springs fault is still active, it is not as active as the parallel Casa Loma fault (San Jacinto fault zone) to the southwest (Onderdonk, 2008). The San Jacinto Fault is considered to be one of the major splays of the San Andreas Fault system and is considered to be the most seismically active faults in southern California (Sharp, 1967). The tectonics and structure of the San Jacinto Fault Zone is very complex and is composed of numerous faults that are discontinuous and/or "en-echelon" in nature.

The San Jacinto Fault (Anza Segment) is a right-lateral, strike-slip fault, with an estimated maximum moment magnitude (M_w) earthquake of M_w7.2.

A review of the County of Riverside Land Information System mapping indicates that the site does not lie within a State or County Earthquake Fault Zone. This is shown on Figure 5 below:

Figure 5: County of Riverside Land Information System, 2020



Groundwater: Groundwater was encountered during our January 2006 exploration at depths ranging from seven (7) to 12.5 feet beneath the existing ground surface in the southwestern portion of the site. Previous exploration in 1994 encountered groundwater at depths ranging from seven to 14.5 feet beneath the existing ground surface. In October 2005, several on-site monitoring wells were installed for a percolation investigation. Observation of groundwater levels in these wells from October 2005 through March 2006 indicated that groundwater levels in the western and southeastern portions of the property were within 10 feet of the ground surface. Groundwater levels in the northeast corner of the property, however, were at least 16 feet deep.

Groundwater was encountered during our 2010 exploration across the site at depths ranging from 11 to 25 feet. Table 1 shows the depths to groundwater within our 2010 exploratory borings:

Table 1: Encountered Depths to Groundwater

Boring No.	Date Drilled	Depth to Groundwater (ft.)
B-01	1/5/10	20
B-02	1/5/10	11
B-03	1/5/10	22
B-04	1/5/10	18
B-05	1/7/10	19
B-06	1/7/10	15
B-07	1/7/10	18
B-08	1/7/10	22
B-09	1/7/10	25

Seismicity: The site is located in a seismically active area, typical for southern California. According to maps compiled by the California Department of Conservation, Division of Mines and Geology (DMG) and California Geologic Survey (CGS) the major faults influencing the site, distances and maximum earthquake magnitudes are shown in Table 2.

Table 2: Fault Zones, Distances and Maximum Earthquake Magnitudes

Fault Zone	Distance (Km)	Earthquake Magnitude (M_w)
Hot Springs-Buck Ridge (San Jacinto)	0.1	6.7
San Jacinto-Anza	7.4	7.2
San Jacinto-San Jacinto Valley	22.5	7.2
Glen Helen-Lytle Creek (San Jacinto)	27.8	7.0
San Jacinto-Coyote Creek	28.9	6.8

Although the Hot Springs fault lies closer to the project site, it is our opinion that the larger and more active San Jacinto fault zone (Anza segment) should be considered as the controlling fault for the seismicity analysis for this project. Published fault parameters indicate an estimated maximum moment magnitude (M_w) earthquake of 7.2 for the Anza segment of the San Jacinto fault zone (CGS, 2002). However, for seismic design purposes, based on recent published parameters for faults in California from the

Working Group on Earthquake Probabilities (Field and others, 2014) we are considering that a cascading effect of rupture will occur along the entire length of the San Jacinto Fault Zone (which includes the San Bernardino Valley, San Jacinto Valley (Casa Loma), Anza, Clark, Borrego Springs, Coyote Creek, and Superstition Mountain fault segments collectively) rather than just the singular Anza Fault segment. Based on published rupture-model data (Petersen et al., 2008), the total rupture area of these combined faults is 4,017.3 square kilometers with an associated Maximum Moment Magnitude (M_W) of 7.8.

Seismic Parameters: The site coordinates (WGS 84) are 33.6802°N / -116.6763°W. On the bases of the subsurface conditions and local fault characteristics, a detailed summary of the site-specific ground motion analysis, which follows Section 21 of the ASCE 7-16 (2017) and the 2019 California Building Code is presented below, with the Seismic Design Parameters Summary appended.

- **<u>Mapped Spectral Acceleration Parameters (CBC 1613A2.1)</u>**

  Based on maps prepared by the USGS (Risk-Adjusted Maximum Considered Earthquake (MCE_R) Ground Motion Parameter for the Coterminous United States for the 0.2 and 1-second Spectral Response Acceleration (5% of Critical Damping), a value of 1.59g for the 0.2 second period (S_s) and 0.618g for the 1.0 second period (S_1) was calculated (ASCE 7-16 Figures 22-1, 22-2 and CBC 1614A.2.1).

- **<u>Site Classification (CBC 1613A.2.2 & ASCE 7-16 Chapter 20)</u>**

  Our subconsultant Terra Geosciences, conducted a geophysical shear-wave velocity survey on the southeasterly portion of the project site. The approximate location of the shear wave survey is shown on Figure 6 Google Earth® imagery below. A copy of the shear wave survey results is appended.

<u>Figure 6:</u> Google Earth® Imagery and Shear Wave Survey Location

Based on the site-specific measured shear wave value of 337.4 m/sec (1,107.2 feet/second), the soil profile type used should be Site Class **"D".** This Class is defined as having the upper 100 feet (30 meters) of the subsurface being underlain by stiff soils with average shear-wave velocities of 600 to 1,200 feet/second, as detailed within Appendix D.

- **Site Coefficients (CBC 1613A2.3(1) and 1613A2.3(2)**

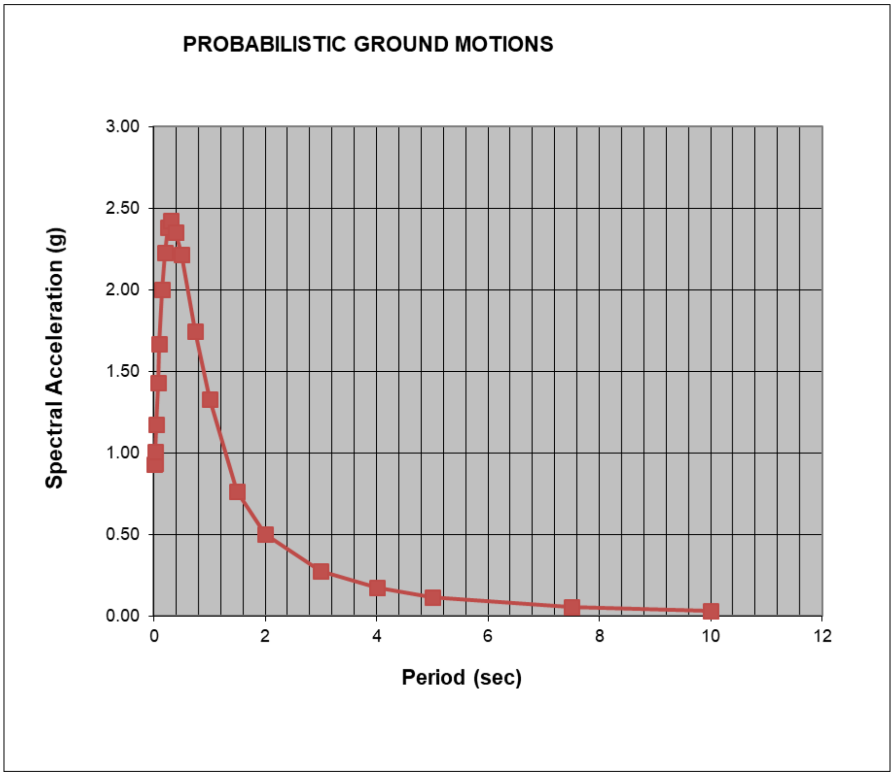
  Fa = 1.0
  Fv = 1.7

- **Probabilistic (MCE_R) Ground Motions (ASCE 7 Section 21.2.1)**

  Per Section 21.2.1, the probabilistic MCE spectral accelerations shall be taken as the spectral response accelerations in the direction of maximum response represented by a five percent damped acceleration response spectrum that is expected to achieve a one percent probability of collapse within a 50-year period.

  The probabilistic analysis included the use of Open Seismic Hazard Analysis (OpenSHA). The selected Earthquake Rupture Forecast (ERF) was UCERF3 along with a Probability of Exceedance of 2% in 50 years. The average of four

Next Generation Attenuation West-2 Relations (2014 NGA) were utilized to produce a response spectrum. These included Chiou & Youngs (2014), Abramson et al., (2014), Boore, et al., (2014) and Campbell & Borzignia (2014). The Probabilistic Risk Targeted Response Spectrum was determined as the product of the ordinates of the probabilistic response spectrum and the applicable risk coefficient (C_R). These values were then modified to produce a spectrum based on the maximum rotated components of ground motion. The resulting MCE_R Response Spectrum is indicated below:



- **<u>Deterministic Spectral Response Analyses (ASCE 7 Section 21.2.2)</u>**

The deterministic MCE_R response acceleration at each period shall be calculated as an 84^{th}-percentile 5 percent damped spectral response acceleration in the direction of mazimum rotated response computed at that period. The largest such accleration calculated for the characteristic earthquakes on all known active faults within the region shall be used. Analyses were conducted with the average of four Next Generation Attenuaton West-2 Relations (2014 NGA), including Chiou & Youngs (2014), Abramson et al., (2014), Boore, et al., (2014), and Campbell & Borzignia (2014).

Based on our review of the Fault Section Database within the Uniform California Earthquake Rupture Forecast (UCERF 3: Field, et al., 2013), discussions with the California Geologic Survey (CGS), and based on the length and maximum magnitude of each of the segments of the San Jacinto Fault Zone, the largest moment magnitude (Mw) for this fault is 7.8, considering a cascading event along the entire fault zone.

Following is a summary of the Deterministic Spectral Response Acceleration Values and Comparison with Deteministic Lower Limit.

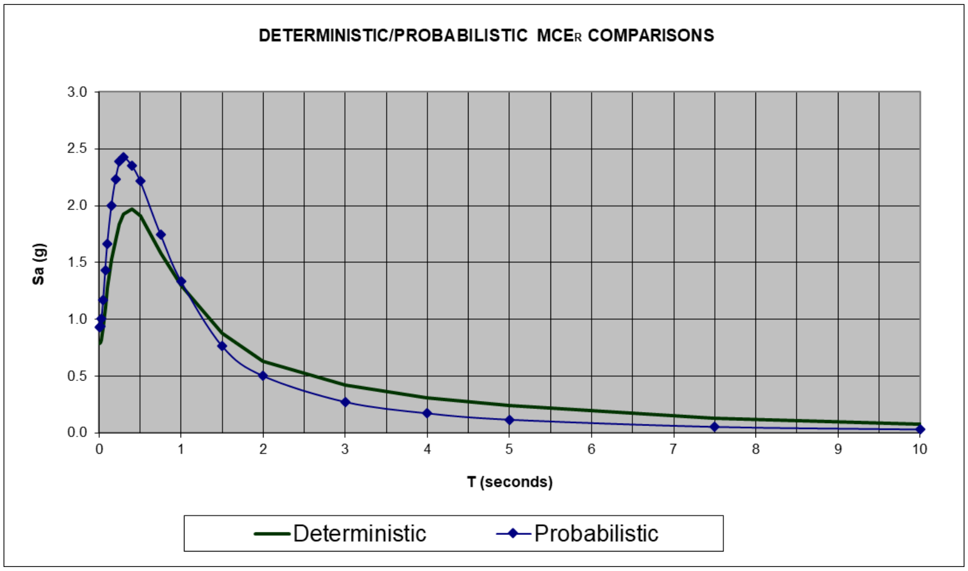
Table 3: Deterministic Summary and Comparison with Deterministic Lower Limit – Section 21.2.2

T	Median S_a (Average)	*Corrected* S_a (per ASCE7-16)*	*Scaled S_a (Average)*
0.010	0.71	0.79	0.79
0.020	0.72	0.79	0.79
0.030	0.74	0.82	0.82
0.050	0.84	0.93	0.93
0.075	1.01	1.11	1.11
0.100	1.16	1.28	1.28
0.150	1.39	1.53	1.53
0.200	1.54	1.70	1.70
0.250	1.65	1.84	1.84
0.300	1.71	1.92	1.92
0.400	1.71	1.97	1.97
0.500	1.62	1.91	1.91
0.750	1.28	1.58	1.58
1.000	1.00	1.30	1.30
1.500	0.66	0.88	0.88
2.000	0.47	0.63	0.63
3.000	0.30	0.42	0.42
4.000	0.21	0.31	0.31
5.000	0.16	0.24	0.24
7.500	0.08	0.13	0.13
10.000	0.05	0.08	0.08
PGA	0.71		0.71
Max Sa=	1.97		
Fa=	1.00	Per ASCE7-16 21.2.2	
1.5XFa=	1.5		
Scaling Factor=	1.00		

***** Correction is the ajustment for Maximum Rotated Value if Applicable

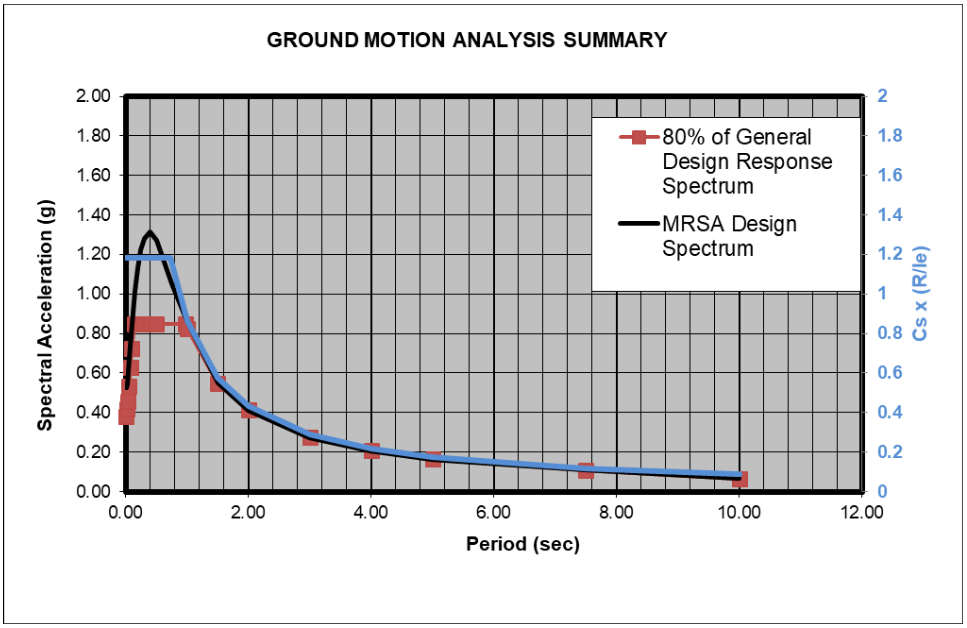
Site-Specific MCE_R (ASCE 7 21.2.3)

The site-specific MCE_R spectral response acceleration at any period, S_{aM}, shall be taken as the lesser of the spectral response accelerations for the probabilistic ground motions of Section 21.2.1 and the deterministic ground motions of Section 21.2.2. The deterministic ground motions were compared with the probabilistic ground motions that were determined per Section 21.2.1. These are plotted in the following diagram:



- **Design Response Spectrum (ASCE 7 Section 21.3)**

Per Section 21,3, the Design Response Spectrum was developed by the following equation: $S_a = 2/3S_{aM}$, where S_{aM} is the MCE_R spectral response acceleration obtained from Section 21.1 or 21.2. The design spectral response acceleration shall not be taken less than 80 percent of S_a. These are plotted and compared with 80% of the CBC Spectrum values in the following diagram:



- **<u>Design Acceleration Parameters (ASCE 7 Section 21.4)</u>**

Where the site-specific procedure is used to determine the design ground motion per Section 21.3, the parameter S_{DS} shall be 90 percent of the peak spectral acceleration, Sa, at any period larger than 0.2 s. The parameter S_{D1} shall be taken as the greater of the products of Sa * T for the periods between 1 and 5 seconds. The parameters S_{MS}, and S_{M1} shall be taken as 1.5 times S_{DS} and S_{D1}, respectively. The values so obtained shall not be less than 80 percent of the values determined per Section 11.4.4 for S_{MS}, SM1 and Section 11.4.5 for S_{DS} and S_{D1}.

S_{DS} is taken as 90% of the highest value for Sa at any period over 0.2 seconds except that it cannot be less than 80% of the maximum value in the General Design Spectrum. In this case, the value of S_{DS} is 1.18g based on upon the lower limit of 80 percent of the general design spectrum. A value of 0.86g was calculated for S_{D1} at a period of 1 second (ASCE 7-16, 21.4).

For the MCE_R 0.2 second period, a value of 1.775g (S_{MS}) was computed. A value of 1.295g (S_{M1}) for the MCE_R 1.0 second period was also calculated (ASCE 7-16, 21.2.3).

- **<u>Site-Specific MCE_G Peak Ground Accelerations (ASCE 7 Section 21.5)</u>**

  The probablistic geometric mean peak ground acceleration (2 percent probability of exceedance within a 50-year period) was calculated as 0.87g. The deterministic geometric mean peak ground acceleration (largest 84^{th} percentile geometric mean peak ground acceleration for characteristic earthquakes on all known active faults within the site region) was calculated as 0.71g. The site-specific MCE_G peak ground acceleration was calculated to be **0.71g**, which was determined by using the lesser of the probablistic (0.87g) or the deteministic (0.71g) geometric mean peak ground accelerations.

The depth to groundwater may be as shallow as seven (7) feet beneath the surface. A liquefaction and seismic settlement analysis was performed and is presented in later sections of this report. Other secondary effects and geologic hazards include slope failure, lurching, seiches, tsunamis and surface rupture along a fault. These are not considered to be of significance to the project.

SUBSURFACE CONDITIONS

Groundwater was encountered during our 2010 exploration across the site at depths ranging from 11 to 25 feet. During our previous exploration, groundwater was encountered at depths ranging from approximately 7 to 16 feet beneath the existing ground surface. We assumed a groundwater level of 5 to 14 feet in our analyses.

The soils consist of alternating layers of predominately granular soils consisting of silty sands and sands. Also of significance is the presence of shallow groundwater throughout the study area.

Within exploratory borings drilled in 2006, the relative compaction of the native undisturbed soils ranged from 80 to over 90 percent. The average relative compaction of the soil samples retrieved from within the upper ten feet of those borings was approximately 87 percent with a statistical uncertainty of approximately four (4) percent. Within our 2010 exploratory borings, the relative compaction of the native undisturbed soils ranged from 79 to over 90 percent. At these boring locations, the average relative compaction of the soil within the upper ten feet was approximately 91 percent with a statistical uncertainty of approximately four (4) percent.

Standard Penetration Testing (SPT) within our 2010 borings indicated blow counts ranging from 5 blows per foot to 28 blows per foot within the upper 30 feet.

Laboratory testing indicates that native soils within the zone of influence to the proposed development are non-plastic. Expansion index testing of a representative sample indicated an expansion index of 8, which is classified as very low expansion potential.

Consolidation testing indicates that the soil is slightly compressible and normally- to slightly over-consolidated. This testing indicated that the soil is not subject to saturation collapse.

Analytical testing indicates the concentration of sulfates in the soil is equal to or less than 0.0033 percent which is considered to be negligible with respect to sulfate attack on concrete. Chloride concentrations ranged from approximately 15 to 40 parts per million. The soil is neutral to slightly alkaline with pH values of 7.4 to 7.8. Saturated resistivity values ranged from approximately 8,400 to 22,000 ohm-cm.

CONCLUSIONS AND RECOMMENDATIONS

On the basis of our field and laboratory exploration and testing, it is our opinion that the proposed construction is feasible from a geotechnical engineering standpoint. The primary issues that will require mitigation are related to near-surface groundwater, soil liquefaction, non-uniform soil conditions and potentially loose and disturbed soils near the surface of the site. Our investigation indicates that liquefaction during a seismic event is expected to be the “controlling” issue in the development of geotechnical design factors for this project.

Expansion testing indicates that on-site soils have a very low expansion potential. Expansive soil design criteria are not required for non-expansive conditions.

Analytical testing indicates that sulfates concentrations are very low. In accordance with ACI 318, Table 4.2.1, the soil can be classified as Class S0 with respect to sulfate exposure. Chloride concentrations are also very low. Resistivity and pH values indicate only a slight corrosion hazard.

Groundwater was encountered during our 2010 exploration across the site at depths ranging from 11 to 25 feet. Groundwater was encountered at depths ranging from approximately seven (7) to 16 feet beneath the existing ground surface during earlier exploration on the site. Historical data suggests that groundwater beneath most of the site is less than 10 feet below the existing ground surface. Depending on the time of year of project construction, excavation dewatering may be necessary.

Ground improvement methods used for the mitigation of the potential for liquefaction will result in changes in the subsurface conditions that will ultimately control the development of the final design parameters. Therefore, the recommended geotechnical design factors presented later in this report are preliminary and will be subject to change. Ground improvement will resolve many of the issues related to the non-uniform conditions within the near surface soils.

The following paragraphs present more detailed discussions related to preliminary design criteria which have been developed on the basis of our previous field and laboratory studies.

Liquefaction: Liquefaction is a phenomenon where soil temporarily loses strength due to cyclic stresses such as those caused by an earthquake. The primary effects of liquefaction are loss of foundation support, sand boils, lateral spreading and seismically induced settlement. Liquefaction is generally considered a hazard in relatively loose sandy soils with the groundwater table within fifty feet of the surface.

The seismic parameters of our current study are based upon an overall soil profile representative of the site and the 2019 CBC (ASCE-16) seismic design criteria. The peak ground acceleration (PGA) used was 0.71g. The earthquake maximum moment magnitude (M_W) of 7.8 used is based on the assumption that a cascading effect of rupture will occur along the entire length of the San Jacinto Fault Zone rather than just the singular Anza Fault segment. Based on the recently published rupture-model data (Petersen et al., 2008), the total rupture area of these combined faults is 4,017.3 square kilometers with an associated Maximum Moment Magnitude (M_W) of 7.8.

Groundwater was encountered during our 2010 exploration across the site at depths ranging from 11 to 25 feet. Groundwater was encountered at depths ranging from approximately seven to 16 feet beneath the existing ground surface during exploration at the site. On the basis of previous studies and groundwater monitoring on the site, we developed a high-groundwater contour map which was used as a basis for the current liquefaction analyses.

The liquefaction analyses were conducted using Geologismiki Liquefaction Assessment Software (2014) utilizing cone penetration test (CPT) data collected at 13 locations. Cone penetration testing is conducted using a penetration device equipped with electronic sensors. As the penetrometer is pushed into the soil, the sensors transmit the forces at the tip and along the side of the device for a continuous record of those forces throughout the depth of the “sounding”.

CPT data are “normalized” for overburden pressures and soil types. Correlations have been developed relating liquefaction resistance to normalized data retrieved from CPT soundings. Analyses were conducted using procedures correlations developed by Boulanger and Idriss (2007) and Robertson (2009).

During a liquefaction event, the zones of potential liquefaction lose strength due to excessive pore pressure, causing the soil to become “quick”. The shear strength is reduced. During and immediately following the event, the ground may settle, sand boils may erupt at the surface and the ground may be subject to lateral movement. Distortion of the ground surface may vary, depending on the soil properties, the local terrain along with the thicknesses of the non-liquefiable and liquefiable layers.

A technical paper (Yi, 2014) summarizes recent work on surface manifestation of liquefaction. Yi references Ishihara's (1985) use of the term "surface manifestation" to describe liquefaction-induced earthquake surface damage.

A quantitative method of using an index called the liquefaction potential index (LPI) was developed and presented by Iwasaki (1978, 1982). The LPI is defined as:

$$LPI = \int_0^{20} F_1\, W(z)\, dz$$

where W(z) = 10 - 0.5z; F_1 = 1 - FS for FS < 1.0; F_1 = 0 for FS > 1.0 and z is the depth below the ground surface in meters. The LPI presents the risk of liquefaction damage as a single value with the following indicators of liquefaction-induced damage as summarized in Table 4 below:

Table 4: LPI Range and Damage

LPI Range and Damage	
LPI Range	**Damage**
LPI = 0	Damage risk is very low
0 < LPI ≤ 5	Damage risk is low
5 < LPI ≤ 15	Damage risk is high
LPI > 15	Damage risk is very high

Liquefaction analysis results are compiled in Appendix C. The results indicate that liquefaction-induced ground damage should be anticipated for most of the CPT sites. The data suggests that high to very high risk of liquefaction-induced damage is likely during a significant seismic event in the areas of CPT Nos. 5, 7 and 10 through 13.

Liquefaction-induced damage will typically be caused by settlement and lateral displacement. The computed lateral displacements were generally on the order of several inches. Due to the lack of open-face cuts or excavations in the immediate area, such displacements may only be a fraction of the computed values.

The following Table 5 presents a summary of computed displacements for each CPT site:

<u>Table 5</u>: CPT Settlement and Displacement

CPT No.	Average Settlement (in.)	Average Displacement (in.)
CPT-01	1.5	20
CPT-02	1.7	15
CPT-03	1.8	36
CPT-04	0.5	20
CPT-05	5.0	34
CPT-06	1.1	20
CPT-07	2.3	31
CPT-08	1.2	20
CPT-09	2.5	30
CPT-10	4.2	19
CPT-11	4.5	23
CPT-12	3.5	27
CPT-13	3.7	21

Average liquefaction-induced settlements were computed to range from less than one inch to five inches. Average lateral displacements were computed in the range of 15 to 36 inches. The computations for lateral displacements were highly variable.

In our opinion, surface deformations resulting from such an event would preclude a conventional foundation design without soil improvement. Displacements of a few inches can cause substantial damage when they result in tension cracks beneath structures. Footings extending into the subsoil on either side of a crack may act as keys, transmitting tensile forces from the spreading soil into the structure. Therefore, a mat foundation which can span the cracks and absorb the frictional forces may be a suitable method of reducing this type of damage. Deep foundations may not be feasible due to the potential for lateral sliding.

The only apparent means of mitigation suitable for conventional foundations will be in the realm of soil improvement. Soil improvement basically consists of making the soil non-liquefiable. This may be done by a variety of methodologies which may include but are not limited to dynamic compaction (heavy tamping), vibro-floatation, stone columns, deep soil mixing and pressure grouting. The selection of the alternative should be made on the basis of consultation with a geotechnical specialty contractor.

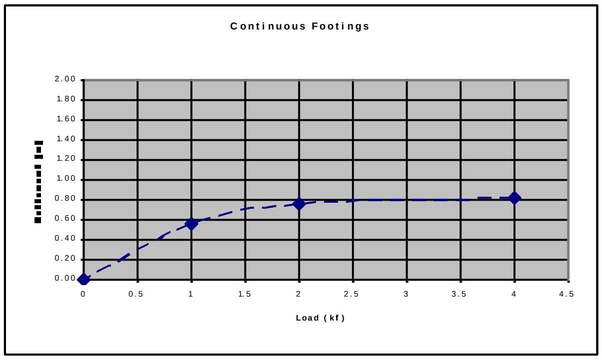
As an alternative to soil improvement, the structures may be designed to withstand the forces caused by the liquefaction event. Structural mitigation will not reduce or eliminate lateral displacements or settlements. This methodology may be used to prevent collapse of structures due to the surficial effects of a liquefaction event. This alternative may include a geogrid reinforced fill placed immediately below the foundations to buffer the surficial effects of settlement and lateral displacement. This will provide a stiff foundation material which will have some tensile strength to resist bending and tensile forces caused by differential settlement and lateral spreading beneath the structure. The benefit of this reinforced zone will primarily be to provide redundancy in the overall design.

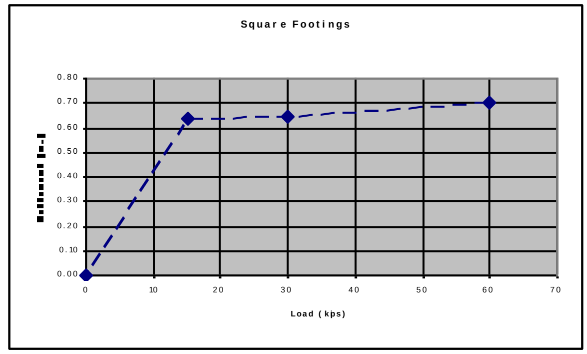
Foundation Design for Native Soils: Where non-habitable structures are proposed or where the liquefaction hazard is mitigated by ground improvement, footings which are supported on properly recompacted native materials may be expected to provide satisfactory support for the proposed structures. All footings should be underlain by properly compacted fill. This may be performed as described in the Site Grading Section of this report.

Footings should have a minimum width of twelve inches and should be founded a minimum of twelve inches beneath the lowest adjacent final grade. Foundations supporting two floors should have a minimum width of fifteen inches and should be supported a minimum of eighteen inches beneath the lowest adjacent final grade. For design, we recommend an allowable soil bearing capacity of 1,500 pounds per square foot.

The recommendations made in the preceding paragraphs are based on the assumption that the liquefaction hazard will be mitigated by ground improvement and that all footings will be supported upon properly compacted soil. All grading should be performed under the testing and observation of a representative of this firm. Prior to the placement of concrete, we recommend that the footing excavations be observed to verify that they extend into satisfactory soil and are free of loose and disturbed materials. If concrete is to be placed on dry absorptive soil in hot and dry weather, the soil should be dampened, but not to a point that there is freestanding water prior to placement. The formwork and reinforcement should also be dampened.

Settlements of properly designed and constructed footings are expected to be within tolerable limits for the proposed structures. Both continuous wall and isolated square footings carrying the design loads within the limits of the allowable bearing capacity are expected to experience a maximum settlement of one inch. Differential settlements of the proposed structures are expected to be less than one-half inch vertical over 20 feet horizontal. Differential settlement will occur across structures with variable loads and footing configurations. These may be estimated on the basis of computed settlements for various loads and loading conditions as presented in the following graphs:



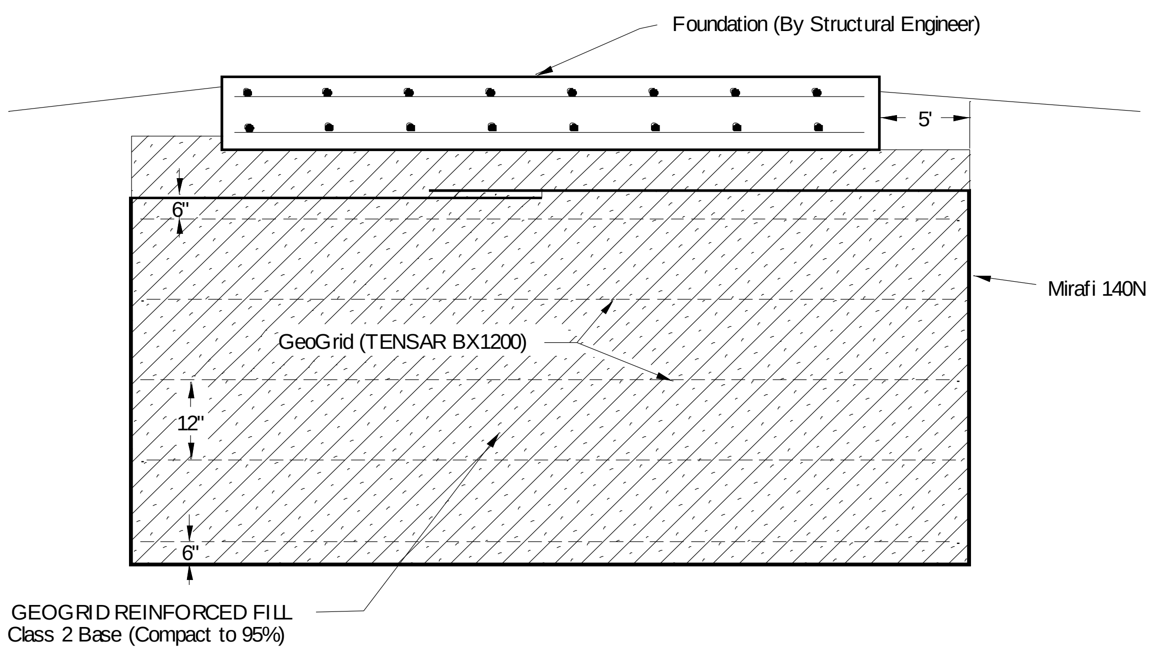


For non-essential structures that are not designed to withstand the effects of liquefaction, conventional foundation systems may be used. For these cases, we recommend recompaction of the existing soils to a depth of at least two times the footing width below the footing base.

Mat foundations may be deigned assuming a modulus of subgrade reaction of 125 pounds per square inch per inch.

Foundation Design on Geogrid Reinforced Base: We assume that foundation designs prepared to resist the effects of liquefaction will be based on the construction of a geogrid reinforced fill. This will be used to provide direct foundation support and to reduce the effects of differential settlement, lateral displacement and sand boils. This basically consists of Class 2 aggregate base with biaxial geogrid placed at one-foot vertical intervals. Figure 7 below is a cross-section of the recommended geogrid reinforced fill:

Figure 7: Typical Cross-Section Geogrid-Reinforced Fill



TYPICAL CROSS-SECTION GEOGRID-REINFORCED FILL

Although the geogrid reinforced fill will significantly reduce the effects of settlement and lateral spreading, it is recommended that the structural designs be based upon the computed values for settlement and lateral displacement.

In designing for lateral displacement, we recommend that designs be based on the assumption that all of the displacement will occur across the building area with one end of the building remaining "fixed". This basically assumes the development of a crack with a width equal to the computed displacement magnitudes provided.

Foundation designs may be based upon a maximum allowable soil bearing capacity of 2,000 pounds per square foot. This may be increased by 33 percent to provide for lateral loads of short duration such as those caused by wind or seismic forces.

Lateral Design: Resistance to lateral loads will be provided by a combination of friction acting at the base of the slab or foundation and passive earth pressure. A coefficient of friction of 0.35 between soil and concrete may be used with dead load forces only. A passive earth pressure of 240 pounds per square foot, per foot of depth, may be used for the sides of footings poured against recompacted or dense native material. Passive earth pressure should be ignored within the upper one foot except where confined as beneath a floor slab, for example.

Trench Wall Stability: Significant caving did not occur within our exploratory borings. All excavations should be configured in accordance with the requirements of Cal/OSHA. We would classify the soils as Type B above the groundwater level. Below the groundwater, special protection for trenches will be required. The classification of the soil and the shoring and/or slope configuration should be the responsibility of the contractor on the basis of the trench depth and the soil encountered. The contractor should have a "competent person" on-site for the purpose of assuring safety within and about all construction excavations.

Retaining Walls: Retaining walls may be necessary during construction and/or landscaping. The retaining walls may be designed for an active earth pressure equivalent to that exerted by a fluid weighing not less than that shown in the following Table 6:

Table 6: Retaining Wall Design Recommendations

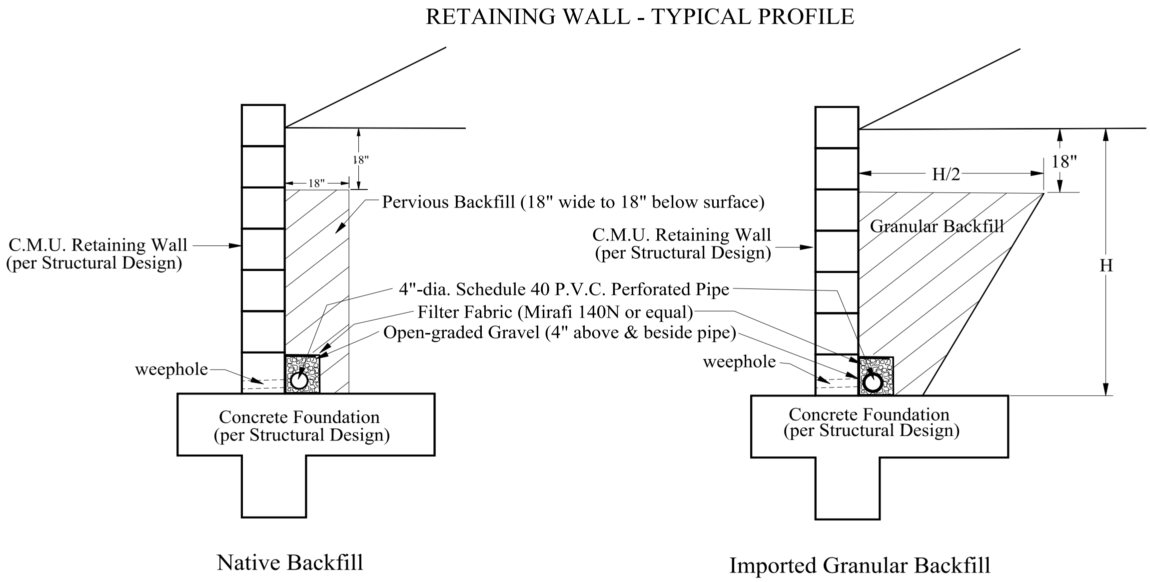
Surface Slope of Retained Material Horizontal:Vertical	If clean sand and/or gravel with ϕ = 38° is used to backfill	If native soils are used to backfill
Level	30	43
2 to 1	43	68

For walls that are restrained, an "at-rest" lateral earth pressure should be used. This may be taken as an equivalent fluid pressure of 65 pounds per cubic foot with the resultant applied at mid-height.

Any applicable construction and seismic surcharges should be added to the above pressures. The effects of seismic forces may be characterized as an equivalent fluid pressure of 33 pounds per cubic foot. The resultant of seismic forces should be applied above the base of the wall a distance of 0.6H where H is the total height.

At least 12 inches of granular material should be used in the backfill behind the walls and water pressure should not be permitted to build up behind retaining walls. The upper 12 to 18 inches of the backfill should consist of soil having a low permeability (less than 10^{-6} cm/sec). All backfill shall be non-expansive. A subdrain should be constructed along the base of the backfill as shown below on Figure 8.

Figure 8: Typical Retaining Wall Profile



Concrete Slabs-on-Grade: Concrete slabs-on-grade should have a minimum thickness of four inches. During final grading and prior to the placement of concrete, all surfaces to receive concrete slabs-on-grade should be compacted in order to maintain a minimum compacted fill thickness of 12 inches. Regardless of the extent of compaction, all concrete will crack due to shrinkage. The soils are not significantly expansive and there are no geotechnical engineering factors that would be used to develop recommendations for the design (e.g. thickness, reinforcement, joint spacing, etc.) of non-structural slabs. However, these are important elements of the design of concrete slabs-on-grade that should not be overlooked. Non-reinforced slabs with no control joints, poorly placed control joints and/or poorly constructed control joints will crack and random locations and could result in unsightly appearance regardless of the soil condition.

Load bearing slabs supported on compacted native soils may be designed using a modulus of subgrade reaction not exceeding 125 pounds per square inch per inch.

Slabs that are designed and constructed in accordance with the provisions of the American Concrete Institute (ACI) as a minimum will perform much better and will be more pleasing in appearance. Shrinkage of concrete should be anticipated. This will result in cracks in all concrete slabs-on-grade. Shrinkage cracks may be directed to saw-cut "control joints" spaced on the basis of slab thickness and reinforcement. ACI typically recommend control joint spacings in unreinforced concrete at maximum intervals equal to the slab thickness times 24. A level subgrade is also an important element in achieving some "control" in the locations of shrinkage cracks. Control joints should be cut immediately following the finishing process and prior to the placement of the curing cover or membrane. Control joints that are cut on the day following the concrete placement are generally ineffective. The placement of reinforcing steel will help in reducing crack width and propagation as-well-as providing for an increase in the control joint spacing. The use of welded wire mesh has typically been observed to be of limited value due to difficulties and lack of care in maintaining the level of the steel in the concrete during placement. The addition of water to the mix to enhance placement and workability frequently results in an excessive water-cement ratio that weakens the concrete, increases drying times and results more cracking due to concrete shrinkage during the initial cure.

It should be assumed that the soils under the slab will likely become saturated during the life of the structure. Moisture will also be emitted from the concrete mixture as it cures. Flooring manufacturers may have specific requirements related to emission rates from concrete that should be achieved prior to the placement of flooring. Typically, these range from 3 to 5 pounds of water per 1000 square feet per 24-hour period. The emission rates are measured using an approximate 72-hour test procedure that we are able to conduct upon request. The drying time of the concrete may be reduced using a lower water-cement ratio such as 0.5 or 0.45. The use of fly ash may enhance workability of the mix and reduce the alkali content within the slab. The use of a chemical membrane or curing compound may increase the drying time. Other suitable curing methods are available. The curing method is important in reducing plastic shrinkage cracking and should not be eliminated to reduce dry times.

Where slabs are to receive moisture sensitive floor coverings, we recommend the use of a vapor retarder. There are various products manufactured for this purpose. ASTM currently provides a standard water vapor permeance of 0.3 perms. Such materials would allow up to 18 gallons of water per week in a 50,000 square foot area. Therefore, it should be understood that these materials are not vapor "barriers". Some flooring applications may require more effective retarders. Therefore, the selection of the vapor retarder should be based upon the type of flooring material and is not considered to be a geotechnical engineering design parameter.

Vapor retarders should have a minimum thickness of 10-mil unless otherwise specified. It is possible that the retarders will be exposed to equipment loads such as ready-mix trucks, buggies, laser screeds, etc. In such cases, the thickness shall be increased to at least 15-mil. Vapor retarders should be placed between two 2-inch thick layers of sand in order to reduce the potential of punctures and to aid in the curing process. In lieu of this, the concrete may be placed directly upon the vapor retarder but should be designed with reinforcement to offset additional curling stresses. Seams and holes made for underground utilities should be properly sealed per the recommendations of the manufacturer.

The vapor retarder recommended in the preceding paragraphs is a common method of reducing the migration of moisture through the slab. It will not prevent all moisture migration through the slab nor will it prohibit the formation of mold or other moisture related problems. For moisture sensitive floor coverings, an expert in that field should be consulted to properly design a vapor retarder suitable for the specific application.

If concrete is to be placed on a dry absorptive subgrade in hot and dry weather, the subgrade should be dampened but not to a point that there is freestanding water prior to placement. The formwork and reinforcement should also be dampened.

Expansive Soils: On-site soils are not considered to be significantly expansive, with test data indicating an expansion index of 8. Special design criteria for expansive soils will not be necessary. Specifically, reinforcement and thickening of foundations and slabs-on-grade in order to resist expansive soil pressures will not be necessary. Reinforcement may be required for other purposes related to structural properties. Nominal reinforcement is recommended for all foundations and concrete slabs-on-grade.

Tentative Pavement Design: All surfaces to receive asphalt concrete paving should be underlain by a minimum compacted fill thickness of 12 inches (excluding aggregate base). This may be performed as described in the Site Grading Section of this report. Although actual R-Value testing was not performed during our investigation, we make the following tentative recommendations for structural street section design on the basis of an R-Value of 40 that was estimated on the basis of soil classification data as shown in Table 7 below:

Table 7: Tentative Recommendations for Structural Street Section

Service	Asphalt Concrete Thickness (ft.)	Base Course Thickness (ft.)
Light (General Parking TI=4.5)	0.25	0.33
Moderate (Driveways, Loading Areas TI=5.5)	0.29	0.5

These recommendations are provided for estimating purposes only. At the completion of rough grading, when the actual soils are more accurately defined, samples should be obtained for actual R-value testing which will serve as a basis for the actual structural street section design. All work within the roadway area will be performed under the inspection of the County of Riverside.

Unpaved surfaces may be used for light vehicle service roads and emergency vehicle access. We've considered two loading conditions. For emergency vehicles, we've assumed a 72,000 pound vehicle weight with axle loads of up to 16,000 pounds. Over a 20 year life span, we've assumed one repetition per month. For light vehicles, we've assumed a 4,000 pound axle load making up to five trips per day. The unpaved section will consist of Class 2 aggregate base. Decomposed granite (DG) will be used as a surface course. For light traffic, five inches of Class 2 aggregate base are recommended. For emergency vehicles, we recommend a thickness of six inches. The surface course should be two to three inches thick.

Shrinkage and Subsidence: Volumetric shrinkage of the material which is excavated and replaced as controlled compacted fill should be anticipated. We estimate that this shrinkage will be on the order of 10 to 15 percent. Subsidence of the surfaces which are scarified and compacted should be on the order of 0.10 feet per foot of recompaction. This will vary depending upon the type of equipment used and the moisture content of the soil at the time of grading. These values for shrinkage and subsidence are exclusive of losses which will occur due to the stripping of the organic material from the site and the removal of trees, utility or irrigation lines, and other subsurface obstructions.

General Site Grading: All grading should be performed in accordance with the applicable provisions of the California Building Code. The following specifications have been developed on the basis of our field and laboratory testing:

1. **Clearing and Grubbing:** All building, slab and pavement areas and all surfaces to receive compacted fill should be cleared of existing loose soil, vegetation, debris, and other unsuitable materials. We recommend a minimum overexcavation of at least 24 inches to provide assurance of processing loose and disturbed soils. Abandoned underground utility lines should be traced out and completely removed from the site. Each end of the abandoned utility line should be securely capped at the entrance and exit to the site to prevent any water from entering the site. Soils loosened due to the removal of trees should be removed and replaced as controlled compacted fill under the observation of a representative of this firm.

2. **Preparation of Surfaces to Receive Compacted Fill:** All surfaces to receive compacted fill should be subjected to compaction testing prior to processing. Testing should indicate a relative compaction of at least 85 percent within the unprocessed native soils. If roots or other deleterious materials are encountered or if the relative compaction fails to meet the acceptance criterion, additional overexcavation will be required until satisfactory conditions are encountered. Upon approval, surfaces to receive fill should be scarified, brought to near optimum moisture content, and compacted to a minimum of 90 percent relative compaction.

3. **Placement of Compacted Fill:** Fill materials consisting of on-site soils or approved imported granular soils, should be spread in shallow lifts, and compacted at near optimum moisture content to a minimum of 90 percent relative compaction. Due to shallow groundwater, the soils may be at very high moisture contents thus requiring drying back or processing in order to achieve stability prior to and during fill placement. This should be investigated by the grading contractor prior to the commencement of site grading.

4. **Preparation of Building Areas:** Within the larger building areas, grading should include the construction of a geogrid reinforced fill. This will consist of overexcavating to at least five feet below the footing base elevation. The overexcavation should also extend at least five feet beyond the building/foundation limits and 24 inches below the existing ground surface. The exposed surface will be subject to acceptance in accordance with Item 2 in this section. Upon acceptance, a non-woven geotextile such as Mirafi 140N should be placed upon the base of the overexcavation in accordance with the manufacturers specifications. The material should be placed in such a manner that it will provide a means of wrapping the sides

of the fill material as it is placed. A six-inch thick layer of Class 2 aggregate base should be placed and compacted to at least 95 percent relative compaction. The first layer of geogrid should be placed followed by 12 inches of Class 2 aggregate base compacted to at least 95 percent relative compaction. The direction of the geogrid should be alternated 90 degrees with each layer. After the placement of the final layer, the geotextile material should be wrapped over the top from the edges and overlapped at least 12 inches. A typical geogrid section is shown on Figure 7 above:

For conventional footings, all building areas should be underlain by a minimum compacted fill thickness based on the footing type and configuration. This assumes that the footing width is directly proportional to the applied load on the basis of the allowable soil bearing capacity provided in this report. The following Table 8 presents the estimated depth and extent of recompaction for continuous and isolated square footings:

Table 8: Estimated Depth and Extent of Recompaction

Foundation Type	Depth of Recompaction below Footing	Extent of Recompaction beyond Footing Edges (ft.)
Isolated Square	One times the footing width	5
Continuous	Two times the footing width	5

Footing areas should be overexcavated to the depths and extents indicated in the preceding table. This zone of recompaction should also extend a minimum of 24 inches below the existing or final ground surface, whichever is deeper. The surface of the overexcavation should then be reviewed for compliance with the criteria of Item 2 under this section. Upon approval the surface shall be scarified, brought to near optimum moisture content and compacted to a minimum of 90 percent relative compaction. An observation should then be made by a representative of this firm to verify the depth of the overexcavation and the relative compaction obtained. The excavated material may then be replaced as controlled compacted fill.

For mat foundations placed on recompacted native soils, we recommend a fill thickness of at least 5 feet below the base of the foundation. This zone of recompaction should also extend a minimum of 24 inches below the existing ground surface. The surface of the overexcavation should then be reviewed for compliance with the criteria of Item 2 under this section. Upon approval the surface shall be scarified, brought to near optimum moisture content and compacted to a minimum of 90 percent relative compaction. An observation should then be made by a representative of this firm to verify the depth of the overexcavation and the relative compaction obtained. The excavated material may then be replaced as controlled compacted fill.

5. **Preparation of Slab and Paving Areas:** During final grading and immediately prior to the placement of concrete or a base course, all surfaces to receive asphalt concrete paving or concrete slabs-on-grade should be processed and tested to assure compaction for a depth of at least of 12 inches. This may be accomplished by a combination of overexcavation, scarification and recompaction of the surface, and replacement of the excavated material as controlled compacted fill. Compaction of the slab areas should be to a minimum of 90 percent relative compaction. Compaction within the proposed pavement areas should be to a minimum of 95 percent relative compaction.

6. **Utility Trench Backfill:** It is our opinion that utility trench backfill consisting of the on-site soil types should be placed by mechanical compaction to a minimum of 90 percent relative compaction. Jetting of the native soils is not recommended.

7. **Testing and Inspection:** During grading tests and observations should be performed by a representative of this firm to verify that the grading is being performed in accordance with the project specifications. Field density testing should be performed in accordance with the ASTM D1556 or D6938 test method. The minimum acceptable degree of compaction should be 90 percent of the maximum dry density as obtained by the ASTM D1557 test method. Where testing indicates insufficient density, additional compactive effort shall be applied until retesting indicates satisfactory compaction.

Testing should also be conducted to verify that the soils will not subject concrete to sulfate attack and are not corrosive. Testing of any proposed import will be necessary prior to placement on the site. Testing of on-site soils may be done on either a selective or random basis as site conditions indicate.

GENERAL

The findings and recommendations presented in this report are based upon an interpolation of the soil conditions between previous borings and CPT sounding locations. Should conditions be encountered during grading that appears to be different than those indicated by this report, this office should be notified.

This update was prepared for Camp Ronald McDonald for Good Times for their use in the design of the proposed facilities. This report may only be used by Camp Ronald McDonald for Good Times for this purpose. The use of this report by parties other than Camp Ronald McDonald for Good Times or for other purposes is not authorized without written permission by Inland Foundation Engineering, Inc. Inland Foundation Engineering, Inc. will not be liable for any projects connected with the unauthorized use of this report.

The recommendations of this report are considered to be preliminary. The final design parameters may only be determined or confirmed at the completion of site grading on the basis of observations made during the site grading operation. To this extent, this report is not considered to be complete until the completion of both the design process and the site preparation.

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APPENDIX A –
2010 FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

For our field exploration, nine exploratory borings were excavated by means of a truck mounted rotary auger rig at the approximate locations shown on Figure No. A-12. Continuous logs of the materials encountered were made on the site by a Soil Engineer. These are presented on Figure Nos. A-3 through A-11.

Representative undisturbed samples were obtained within our borings by driving a thin-walled steel penetration sampler with successive 30-inch drops of a 140-pound hammer. The number of blows required to achieve each six inches of penetration were recorded on our boring logs and used for estimating the relative consistencies of the subsoils. Two different samplers were used. The first sampler used was a Standard Penetration Sampler for which published correlations relating the number of hammer blows to the strength of the soil are available. The second sampler type was larger in diameter, carrying brass sample rings having inner diameters of 2.41 inches. Undisturbed samples were removed from the sampler and placed in moisture sealed containers in order to preserve the natural soil moisture content. They were then transported to our laboratory for further observations and testing.

Representative bulk samples were obtained and returned to our laboratory for further testing and observations. The results of this testing are discussed and presented in Appendix B.

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487-06)

PRIMARY DIVISIONS			GROUP SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIALS IS LARGER THAN #200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN #4 SIEVE	CLEAN GRAVELS (LESS THAN) 5% FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVEL WITH FINES	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN #4 SIEVE	CLEAN SANDS (LESS THAN) 5% FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF OF MATERIALS IS SMALLER THAN #200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT IS LESS THAN 50	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT IS GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
	HIGHLY ORGANIC SOILS		PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS
TYPICAL FORMATIONAL MATERIALS	SANDSTONES		SS	
	SILTSTONES		SH	
	CLAYSTONES		CS	
	LIMESTONES		LS	
	SHALE		SL	

CONSISTENCY CRITERIA BASES ON FIELD TESTS

RELATIVE DENSITY – COARSE – GRAIN SOIL

RELATIVE DENSITY	SPT * (# BLOWS/FT)	RELATIVE DENSITY (%)
VERY LOOSE	<4	0-15
LOOSE	4-10	15-35
MEDIUM DENSE	10-30	35-65
DENSE	30-50	65-85
VERY DENSE	>50	85-100

CONSISTENCY – FINE-GRAIN SOIL

CONSISTENCY	SPT* (# BLOWS/FT)	TORVANE UNDRAINED SHEAR STRENGTH (tsf)	POCKET ** PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf)
Very Soft	<2	<0.13	<0.25
Soft	2-4	0.13-0.25	0.25-0.5
Medium Stiff	4-8	0.25-0.5	0.5-1.0
Stiff	8-15	0.5-1.0	1.0-2.0
Very Stiff	15-30	1.0-2.0	2.0-4.0
Hard	>30	>2.0	>4.0

* NUMBER OF BLOWS OF 140 POUND HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1 3/8 INCH I.D.) SPLIT BARREL SAMPLER (ASTM -1586 STANDARD PENETRATION TEST)

** UNCONFINED COMPRESSIVE STRENGTH IN TONS/SQ.FT. READ FROM POCKET PENETROMETER

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp but no visible water
WET	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbled or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

EXPLANATION OF LOGS

Figure A-2

LOG OF BORING B-01

Elevation:	4379.6	Logged by:	FWC
Date(s) Drilled:	1/5/10		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

USCS	Description
SW SM	**SAND with SILT,** fine to coarse grained, dark olive brown, moist, medium dense.
SM	**SILTY SAND,** very fine to medium grained with trace clay, olive, moist, medium dense, interbedded with thin layers sandy silt throughout.
SC	**CLAYEY SAND,** fine to medium grained, olive, moist, dense.
SM	**SILTY SAND,** fine to medium grained, olive, moist, dense.
SC	**CLAYEY SAND,** fine to medium grained, olive, moist, medium dense to dense, interbedded with thin layers sandy clay.
SM	**SILTY SAND,** fine to medium grained, mottled olive, moist, dense.
SW SM	**SAND with SILT,** fine to coarse grained, olive, moist, medium dense.
SC SM	**SILTY SAND,** fine grained, dark olive brown, moist to wet, medium dense, interbedded with layers of clayey sand or sandy clay throughout.
	SILTY, CLAYEY SAND, fine to medium grained, olive, wet, medium dense.
SM	**SILTY SAND,** fine to medium grained, dark olive brown, wet, medium dense.
SW	**SAND,** fine to coarse grained, olive brown, wet, medium dense.
SM	**SILTY SAND,** very fine to medium grained, olive brown, wet, medium dense, interbedded with thin layers sand throughout.
SM	**SILTY SAND,** fine to medium grained, olive brown, wet, medium dense to dense, interbedded with sand throughout.
SW	**SAND,** fine to coarse grained with gravel, gray, wet, dense. - hard drilling -
	GRANITE, highly to moderately weathered, olive. - very hard drilling -

End of boring at 51 feet. Auger Refusal. Groundwater encountered at 20 feet and mottling at 12.5 feet.

Sample Type	Blows/6"	Moisture (%)	Dry Unit Wt. (pcf)	Relative Compaction (%)
BULK		9	98	
SS	10, 15	6	112	
BULK				
SS	30, 40	6	123	
SS	25, 30	7	121	
BULK				
SS	26, 30	7	122	
SS	8, 14	7	112	
BULK				
SS	11, 20	14	119	
SPT	4, 5	20		
BULK				
SS	11	26	106	
SPT	12, 6, 9	22		
SPT	13, 15	17		
SS	26, 38	19	115	
SPT	22	25	106	
SS	32, 17	21		
SPT	30, 14	18		
SS	14, 10, 50/3"	21	116	
SPT	25, 50/4"	13		

INLAND FOUNDATION ENGINEERING, INC.

Geotechnical Exploration
56400 Apple Canyon Rd
Mountain Center Area, CA
Project No. C457-005

Figure No. A-3

LOG OF BORING B-02

Elevation:	4382.5	Date(s) Drilled:	1/5/10
Logged by:	FWC		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
	SM	**SILTY SAND,** fine to coarse grained with trace clay, dark olive brown, very moist, loose to medium dense.	BULK		10	88	
			SS	5, 7	10	117	
5			SS	5, 6	13	121	
	SP SM	**SAND with SILT,** fine to coarse grained, olive brown, moist, medium dense, interbedded with very thin layers silty sand throughout.	BULK				
			SS	11, 15	6	113	
10	SM	▽ **SILTY SAND,** fine to coarse grained, dark olive brown, very moist to wet, medium dense, interbedded with thin layers sand or clayey sand throughout.	BULK				
			SS	8, 11	17	113	
15			SS	7, 14	17	118	
	SW	**SAND,** fine to coarse grained, olive brown, moist, medium dense.					
20			SS	22, 29	7	113	

End of boring at 21.5 feet. Perched groundwater encountered from 11 to 16 feet.

INLAND FOUNDATION ENGINEERING, INC.

Geotechnical Exploration
56400 Apple Canyon Rd
Mountain Center Area, CA
Project No. C457-005

Figure No. **A-4**

LOG OF BORING B-03

Elevation:	4383.5	Date(s) Drilled:	1/5/10
Logged by:	FWC		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	GRAPHIC	USCS	SUMMARY OF SUBSURFACE CONDITIONS	DRIVE SAMPLE	BULK SAMPLE	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
		SM	**SILTY SAND,** fine to coarse grained, dark olive brown, moist, medium dense.			BULK		9	105	
						SS	11 16	2	115	
5						SS	13 17	3	118	
		SC SM	**SILTY, CLAYEY SAND,** fine to coarse grained, dark olive brown, moist, medium dense, interbedded with thin layers of silty sand or clayey sand.			BULK				
10						SS	8 15	12	123	
		SC	**CLAYEY SAND**, fine to medium grained, olive, very moist, medium dense.			SS	12 16	13	124	
15						SS	14 20	11	128	
		SW SM	**SAND with SILT,** fine to coarse grained, olive brown, moist, medium dense, interbedded with layers of silty sand.							
20						SS	15 17	8	117	
		SM	▽ **SILTY SAND,** fine to coarse grained with trace clay, dark olive brown, very moist to wet, medium dense.			SS	13 16	13	123	

End of boring at 22 feet. Groundwater encountered at 22 feet.

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Figure No. **A-5**

LOG OF BORING B-04

Elevation:	4392.6	Date(s) Drilled:	1/5/10
Drilling Method:	Rotary Auger		
Drilling Rig:	CME-75		
Boring Diameter:	8-inches		

Logged by:	FWC
Hammer Type:	Auto-Trip
Hammer Weight:	140 lb.
Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
0	SM	**SILTY SAND,** fine to coarse grained, dark olive brown, moist, medium dense.	BULK		6	110	
5	SC SM	**SILTY, CLAYEY SAND,** fine to medium grained, olive brown, slightly moist, medium dense, interbedded thin layers sand throughout. - moderately cemented -	BULK SS	19 25	15 5	119 121	
			SS	24 31	4	123	
10	SM	**SILTY SAND,** fine to medium grained, dark brown, slightly moist, medium dense.	SS	22 28	4	113	
	SM	**SILTY SAND,** fine to medium grained with trace clay, dark olive brown, moist, medium dense, interbedded with thin layers sand throughout.	SS BULK	16 18	5	120	
15	SM	**SILTY SAND,** fine to coarse grained with trace clay, dark olive brown, very moist, medium dense. (▽ groundwater)	BULK SS	10 16	13	124	
20			SPT	3 2	16		
25	SC SM	**SILTY, CLAYEY SAND,** fine to coarse grained, olive brown, wet, medium dense, interbedded with layers of silty sand and sand.	SS	9 10	14	121	
30			SPT	4 4	16		
35			SS	15 23	16	119	
	SM	**SILTY SAND,** fine to coarse grained, olive, wet, medium dense, interbedded with layers of silty, clayey sand.	SPT	9 12	13		
40			SS	13 17	18	117	
45	SM	**SILTY SAND,** fine to coarse grained with trace clay, dark olive brown, wet, medium dense, interbedded with thin layers of silty sand or sand.	SPT	7 9	20		
50		**GRANITE**, highly weathered, olive.	SPT	16 21	19		
55			SPT	50/5"	16		
		End of boring at 55.42 feet. Groundwater encountered at 18 feet.					

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Figure No. **A-6**

LOG OF BORING B-05

Elevation:	4393.6	Date(s) Drilled:	1/7/10	Logged by:	FWC
Drilling Method:	Rotary Auger			Hammer Type:	Auto-Trip
Drilling Rig:	CME-75LC			Hammer Weight:	140 lb.
Boring Diameter:	8-inches			Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
0	SM	**SILTY SAND**, very fine to fine grained, dark olive brown, moist, medium dense.	BULK		15	82	
			SS	5	11	116	
	SC	**CLAYEY SAND**, fine to medium grained, olive brown, moist, medium dense, interbedded with thin layers of silty, clayey sand.	BULK	9	15	120	
5			SS	6 8	7	117	
			SS	10	13	118	
10	SM	**SILTY SAND**, fine to coarse grained, olive, moist, medium dense, interbedded with thin layers of sand or silty, clayey sand.	BULK	14			
			SS	9 8	12	117	
15			SS	15	9	126	
	SC SM	**SILTY, CLAYEY SAND**, fine to medium grained, dark olive brown, moist to wet, medium dense, interbedded with layers of ▽ silty sand and sand.	BULK	23			
20			SS	11 19	14	122	
	SM	**SILTY SAND**, fine to medium grained with trace clay, olive, wet, medium dense, interbedded with sand.	SPT	6 5	21		
25	SC SM	**SILTY, CLAYEY SAND**, fine to medium grained, olive, wet, medium dense, interbedded with thin layers of clayey sand.	SS	8 8	16	120	
			SPT	5 4	18		
30			SS	10 17	17	118	
	SM	**SILTY SAND**, fine to medium grained with trace clay, dark olive brown, wet, medium dense, interbedded with thin layers sand throughout.					
35			SPT	5 7	16		
40	SW SM	**SAND with SILT**, fine to coarse grained, olive, wet, medium dense, interbedded with layers of silty sand.	SPT	6 7	16		
45		**GRANITE**, highly to severelyly weathered, olive.	SS	50/5"	14	125	
		End of boring at 45.5 feet. Groundwater encountered at 19 feet.					

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Geotechnical Exploration
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Figure No. **A-7**

LOG OF BORING B-06

Elevation:	4388.0	Date(s) Drilled: 1/7/10	Logged by: FWC
Drilling Method:	Rotary Auger		Hammer Type: Auto-Trip
Drilling Rig:	CME-75LC		Hammer Weight: 140 lb.
Boring Diameter:	8-inches		Hammer Drop: 30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
	SM	**SILTY SAND**, fine to medium grained, dark olive brown, moist, loose to medium dense.			17	96	
	SC SM	**SILTY, CLAYEY SAND**, fine to medium grained, olive, slightly moist, dense, moderately cemented.	BULK		15	118	
5			SS	40 40	4	116	
	SM	**SILTY SAND**, fine to medium grained with trace clay, dark olive brown, dry, dense, moderately cemented, periodic layers clayey sand.	BULK				
			SS	35 41	4	123	
10			SS	12	13	122	
	SW	**SAND**, fine to coarse grained, olive brown, slightly moist, medium dense.	BULK	15			
	SM	**SILTY SAND**, fine to medium grained with trace clay, olive brown, slightly moist, medium dense.	SS	15 17	11	126	
15	SC	**CLAYEY SAND**, fine to medium grained, dark olive brown, very moist to wet, medium dense, interbedded with thin layers of sand or silty, clayey sand.	BULK				
			SS	11 15	17	118	
20			SPT	4 8	17		
25	SP	**SAND**, fine to coarse grained, olive, wet, medium dense.					
	SW	**SAND**, fine to medium grained, dark olive brown, wet, medium dense.	SPT	1 5	24		
30	SM	**SILTY SAND**, fine to medium grained with clay, dark olive brown, wet, medium dense.	SS	8 20	14	122	

End of boring at 32.5 feet. Groundwater encountered at 14.5 feet.

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Figure No. **A-8**

LOG OF BORING B-07

Elevation:	4383.0	Date(s) Drilled:	1/7/10
Logged by:	FWC		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75LC	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
	SM	**SILTY SAND,** fine to medium grained, dark olive brown, very moist, loose to medium dense.			12	100	
			SS	15 19	5	128	
5	SM	**SILTY SAND,** fine to medium grained with trace clay, olive brown, slightly moist to moist, medium dense.	SS	8 14	8	120	
10	SW SM	**SAND with SILT,** fine to coarse grained, olive brown, moist, medium dense.	SS	10	6	111	
	SM	**SILTY SAND**, fine to medium grained with trace clay, dark olive brown, very moist, medium dense.	BULK	10			
15			SS	10 12	17	116	
	CL	**SANDY CLAY**, fine grained, dark olive brown, moist, stiff.	SS	4	16	114	
20	SC SM	**SILTY, CLAYEY SAND,** fine to coarse grained, brown, slightly moist, medium dense.	SS	8 11 12	17	121	
25	SM	**SILTY SAND,** fine to medium grained, olive brown, moist, medium dense.	SPT	6 8	17		
30	SC	**CLAYEY SAND,** fine to coarse grained, olive brown, wet, medium dense, interbedded with silty sand throughout.	SS	13 11	16	121	
	SM	**SILTY SAND**, fine to medium grained, olive brown, moist, medium dense.	SPT	6 5	19		
35	SW SM	**SAND with SILT,** fine to coarse grained, olive, wet, medium dense.	SS	10 22	18	116	
40	ML	**SANDY SILT**, black, wet, stiff.	SPT	5 7	33		
	SM	**SILTY SAND,** fine to medium grained with trace clay, olive brown, wet, medium dense.					
	SW SM	**SAND with SILT,** fine to coarse grained, olive brown, wet, medium dense.	SPT	12 15	16		
		End of boring at 44.5 feet. Groundwater encountered at 17.5 feet.					

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Geotechnical Exploration
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Figure No. **A-9**

LOG OF BORING B-08

Elevation:	4383.5	Date(s) Drilled:	1/7/10
Logged by:	FWC		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75LC	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
0	SM	**SILTY SAND**, fine to medium grained, dark brown to black, moist, loose to medium dense.	BULK		9	106	
5			SS	8 10	5	116	
			SS	11 21	5	116	
10	SM	**SILTY SAND**, fine to coarse grained with trace gravel, olive brown, slightly moist, medium dense to dense.	BULK				
			SS	40 41	3	123	
	SP SM	**SAND with SILT**, fine to coarse grained, olive brown, moist, medium dense, interbedded with thin layers of silty sand.	SS	20 26	4	119	
15			BULK				
			SS	11 15	6	119	
			SS	19 26	3	117	
20	SM	**SILTY SAND**, fine to medium grained, olive, moist, medium dense.					
	SW	**SAND**, fine to coarse grained, olive brown, moist, medium dense.	SS	14 20	10	116	
			BULK				
25	SM	**SILTY SAND**, fine to medium grained with trace clay, olive brown, wet, medium dense.	SPT	6 8	19		
	SP SM	**SAND with SILT**, fine to coarse grained, olive brown, wet, medium dense, interbedded with layers of silty sand.					
30			SS	25 28	14	121	
	SM	**SILTY SAND**, fine to medium grained, olive, wet, medium dense.	SPT	5 9	27		
35		**GRANITE**, highly weathered, olive.	SPT	36 30	14		

End of boring at 36.5 feet. Groundwater encountered at 22.5 feet.

INLAND FOUNDATION ENGINEERING, INC.	**Geotechnical Exploration** **56400 Apple Canyon Rd** **Mountain Center Area, CA** **Project No. C457-005**	Figure No. **A-10**

LOG OF BORING B-09

Elevation:	4386.7	Date(s) Drilled:	1/7/10
Logged by:	FWC		
Drilling Method:	Rotary Auger	Hammer Type:	Auto-Trip
Drilling Rig:	CME-75LC	Hammer Weight:	140 lb.
Boring Diameter:	8-inches	Hammer Drop:	30-inches

SUMMARY OF SUBSURFACE CONDITIONS

This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered and is representative of interpretations made during drilling. Contrasting data derived from laboratory analysis may not be reflected in these representations.

DEPTH (ft)	USCS	Description	SAMPLE TYPE	BLOWS/6"	MOISTURE (%)	DRY UNIT WT. (pcf)	RELATIVE COMPACTION (%)
	SM	**SILTY SAND,** fine to medium grained, dark olive brown, moist, loose, interbedded with sand layers throughout.			7	91	
			SS	4	3	111	
	SP SM	**SAND with SILT,** fine to very coarse grained, olive brown, slightly moist, loose.		6	16	114	
5			SS	5 5	2		
			SS	8 12	2	107	
10	SM	**SILTY SAND,** fine to medium grained, olive, slightly moist, medium dense.	SS	20 32	3	121	
	SC	**CLAYEY SAND**, very fine to fine grained, olive brown, moist, dense.					
15	SW	**SAND,** fine to very coarse grained, olive brown, slightly moist, medium dense, interbedded with layers silty sand.	SS	15 19	7	119	
			SS	19 25	4	116	
20	SP	**SAND,** fine to coarse grained, olive brown, slightly moist, medium dense.	SPT	7 9	3		
25	SM	**SILTY SAND,** fine to medium grained, olive brown, moist to wet, medium dense.	SS	17 18	15	117	
			SPT	4 6	22		
30	SM	**SILTY SAND,** fine to medium grained with trace clay and trace gravel and cobbles, olive brown, wet, medium dense.	SS	18 36	13	128	
35			SPT	6 11	19		
40	SC SM	**SILTY, CLAYEY SAND,** fine to coarse grained with trace gravel, olive brown, wet, medium dense, interbedded with thin layers of sand with silt.	SS	21 27	17	118	
		GRANITE, severely weathered, olive.	SPT	15 16	24		

End of boring at 43.5 feet. Auger Refusal. Groundwater encountered at 25 feet.

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Geotechnical Exploration
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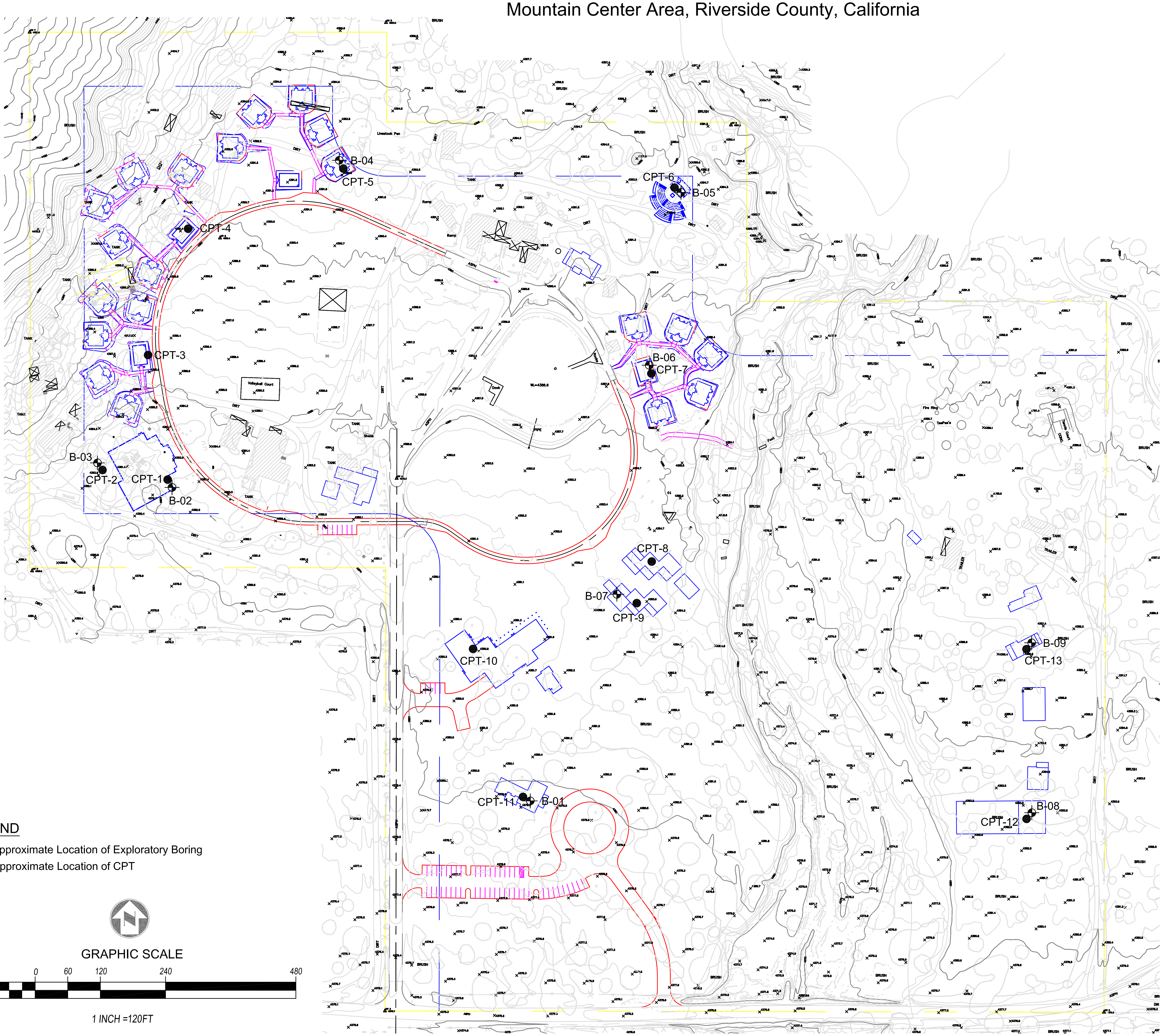
Figure No. **A-11**

SITE PLAN

Facilities Improvements to Camp Ronald McDonald For Good Times
Mountain Center Area, Riverside County, California



LEGEND

- ⊕ = Approximate Location of Exploratory Boring
- ● = Approximate Location of CPT

GRAPHIC SCALE

120 0 60 120 240 480

1 INCH =120FT

INLAND FOUNDATION ENGINEERING, INC.
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JOB NO.: C457-005	DATE: April 1, 2010	Fig. A-12

APPENDIX B –
2010 LABORATORY TESTING

APPENDIX B

LABORATORY TESTING

Representative bulk soil samples were obtained in the field and returned to our laboratory for additional observations and testing. Laboratory testing was generally performed in two phases. The first phase consisted of testing in order to determine the compaction of the existing natural soil and the general engineering classifications of the soils across the site. This testing was performed in order to estimate the engineering characteristics of the soil and to serve as a basis for selecting samples for the second phase of testing. The second phase consisted of soil mechanics and analytical testing. This testing included direct shear testing, consolidation testing, and testing to estimate the concentration of water-soluble sulfate, pH, resistivity and chlorides. These tests were performed in order to provide a means of developing specific design recommendations based on the strength and corrosive characteristics of the soil.

CLASSIFICATION AND COMPACTION TESTING

Unit Weight and Moisture Content Determinations: Each undisturbed sample was weighed and measured in order to determine its unit weight. A small portion of each sample was then subjected to testing in order to determine its moisture content. This testing was performed in accordance with the ASTM Standards D2937-04 and D2216-05. This was used in order to determine the dry density of the soil in its natural condition. The results of this testing are shown on the Boring Logs (Figure Nos. A-3 through A-11).

Maximum Density-Optimum Moisture Determinations: Representative soil types were selected for maximum density determinations. This testing was performed in accordance with the ASTM Standard D1557-02 test method A. The results of this testing are presented graphically on Figure Nos. B-4 through B-6. The maximum densities are compared to the field densities of the soil in order to determine the existing relative compaction to the soil. This is shown on the Boring Logs, and is useful in estimating the strength and compressibility of the soil.

Classification Testing: Fifty-two soil samples were selected for classification testing. This testing consists of mechanical grain size analyses and Atterberg Limits determinations. This testing was performed in accordance with the ASTM Standards D422 -63(2002) and D4318-05. These tests provide information for developing classifications for the soil in accordance with the Unified Classification System. This classification system categorizes the soil into groups having similar engineering characteristics. The results of this testing are very useful in detecting variations in the soils and in selecting samples for further testing. The results of this testing are presented on Figure Nos. B-7 through B-17.

SOIL MECHANIC'S TESTING

Direct Shear Testing: Eight samples were selected for Direct Shear Testing. This testing was performed in accordance with the ASTM Standard D3080-04. This testing measures the shear strength of the soil under various normal pressures and is used in developing parameters for foundation design and lateral design. Testing was performed using recompacted test specimens which were saturated prior to testing. Testing was performed using a strain controlled test apparatus with normal pressures ranging from 500 to 2500 pounds per square foot. The results of this testing are shown on Figure Nos. B-18 and B-19.

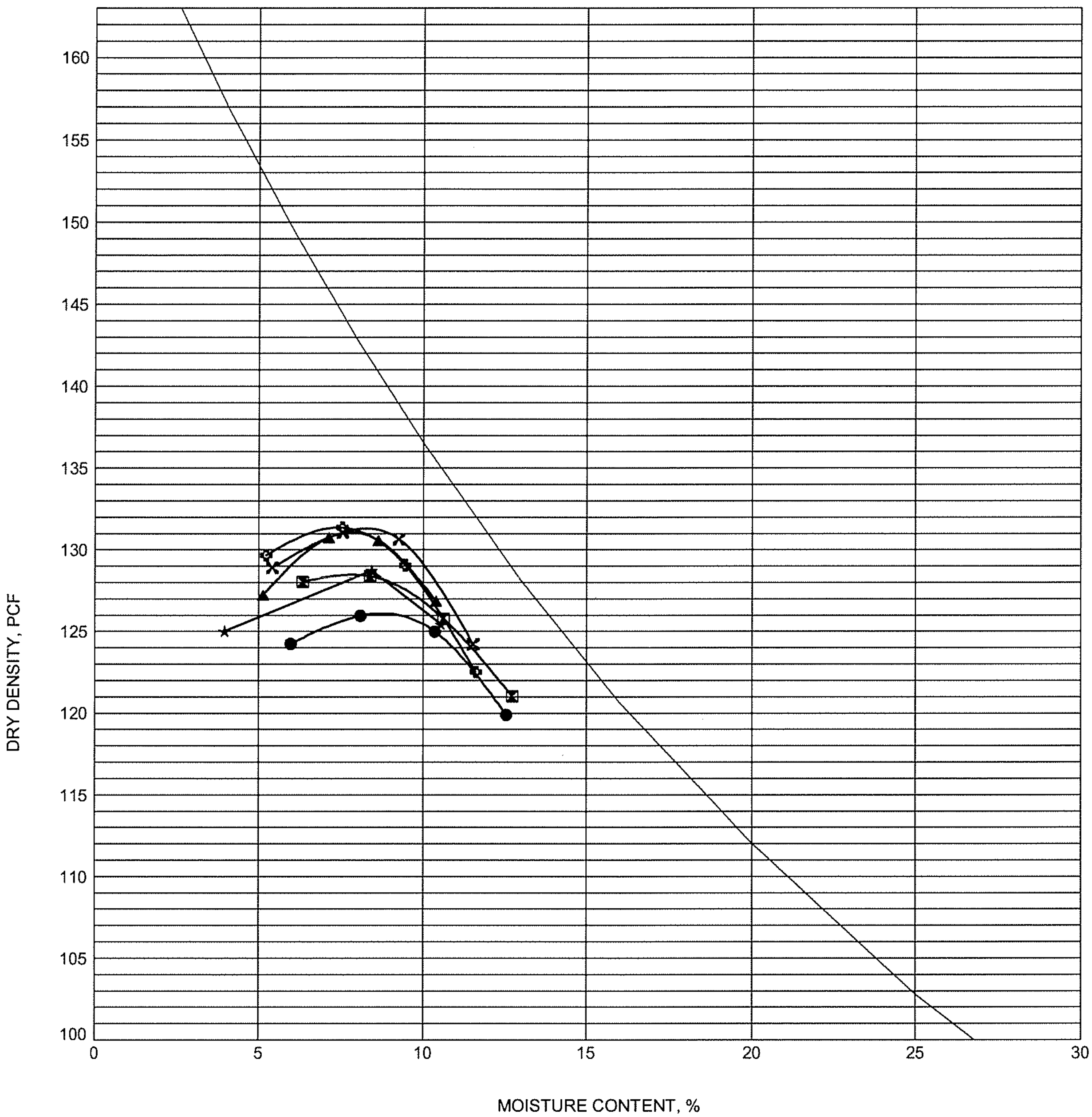
Consolidation Testing: One sample was selected for consolidation testing. This testing was performed in accordance with the ASTM Standard D2435-04. For this test, relatively undisturbed samples were selected and carefully trimmed into a one inch thick by 2.41-inch diameter consolidometer. The consolidometer was moisture sealed in order to preserve the natural moisture content during the initial stages of testing. Loads ranging up to 22,666.1 pounds per square foot were applied progressively with the rate of settlement declining to a value of 0.0002 inches per hour prior to the application of each subsequent load. At a preselected load, water was introduced into the consolidometer in order to observe the potential for saturation collapse. The results of this testing are presented graphically on Figure No. B-20.

Expansion Testing: One sample was selected for Expansion testing. Expansion testing was performed in accordance with ASTM D4829-07. This testing consists of remolding 4-inch diameter by 1-inch thick test specimens to a moisture content and dry density corresponding to approximately 50 percent saturation. The samples are subjected to a surcharge of 144 pounds per square foot and allowed to reach equilibrium. At that point the specimens are inundated with distilled water. The linear expansion is then measured until complete. The results of this testing are shown on Figure No. B-21.

ANALYTICAL TESTING

Six samples were selected to determine the concentration of soluble sulfates, chlorides, pH level, and resistivity of and within the on-site soils. The following table presents the results of this testing:

Sample Location	Sample Depth (ft.)	Water-Soluble Sulfates (%)	Chlorides (ppm)	Minimum Resistivity (ohm-cm)	pH
B-01	0.0-3.75	<0.001	14.99	13,600	7.4
B-03	0.0-7.0	<0.001	39.49	11,000	7.6
B-05	3.0-8.5	0.0033	19.99	11,000	7.4
B-06	2.5-5.5	<0.001	24.99	8,400	7.5
B-08	0.0-8.5	0.0015	24.99	22,000	7.4
B-09	3.0-10.0	<0.001	19.49	12,500	7.8



Specimen Identification			Classification	Max.Density	MC%
●	**B-01**	**0.0**	**WELL-GRADED SAND with SILT SW-SM**	**126.5**	**9.5**
⊠	**B-02**	**6.0**	**POORLY GRADED SAND with SILT SP-SM**	**128.5**	**9.0**
▲	**B-02**	**9.5**	**SILTY SAND SM**	**132.0**	**8.0**
★	**B-03**	**0.0**	**SILTY SAND SM**	**129.0**	**8.5**
✕	**B-03**	**7.0**	**SILTY, CLAYEY SAND SC-SM**	**132.5**	**8.5**
✜	**B-04**	**3.3**	**SILTY, CLAYEY SAND SC-SM**	**132.0**	**8.0**

PROJECT Geotechnical Exploration
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MAXIMUM DENSITY-OPTIMUM MOISTURE CURVES

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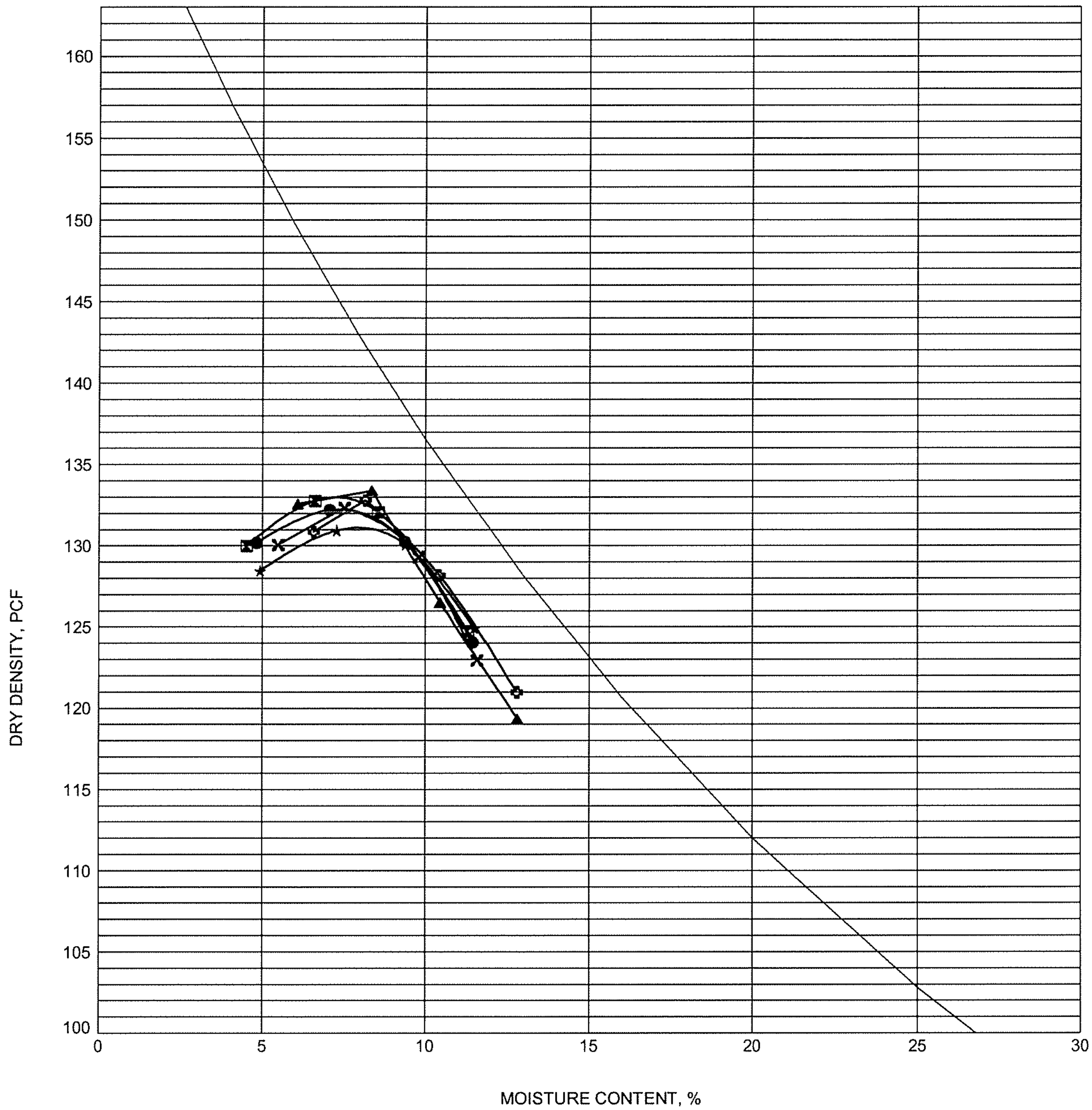
FIGURE NO. B-4



Specimen Identification			Classification	Max.Density	MC%
●	**B-04**	**11.5**	**SILTY SAND SM**	**133.0**	**8.0**
⊠	**B-04**	**15.5**	**SILTY SAND SM**	**134.0**	**8.0**
▲	**B-05**	**3.0**	**CLAYEY SAND SC**	**133.5**	**8.5**
★	**B-06**	**2.5**	**SILTY, CLAYEY SAND SC-SM**	**131.5**	**8.5**
✕	**B-06**	**5.5**	**SILTY SAND SM**	**133.0**	**8.5**
✪	**B-07**	**11.3**	**SILTY SAND SM**	**133.0**	**9.0**

PROJECT Geotechnical Exploration
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MAXIMUM DENSITY-OPTIMUM MOISTURE CURVES

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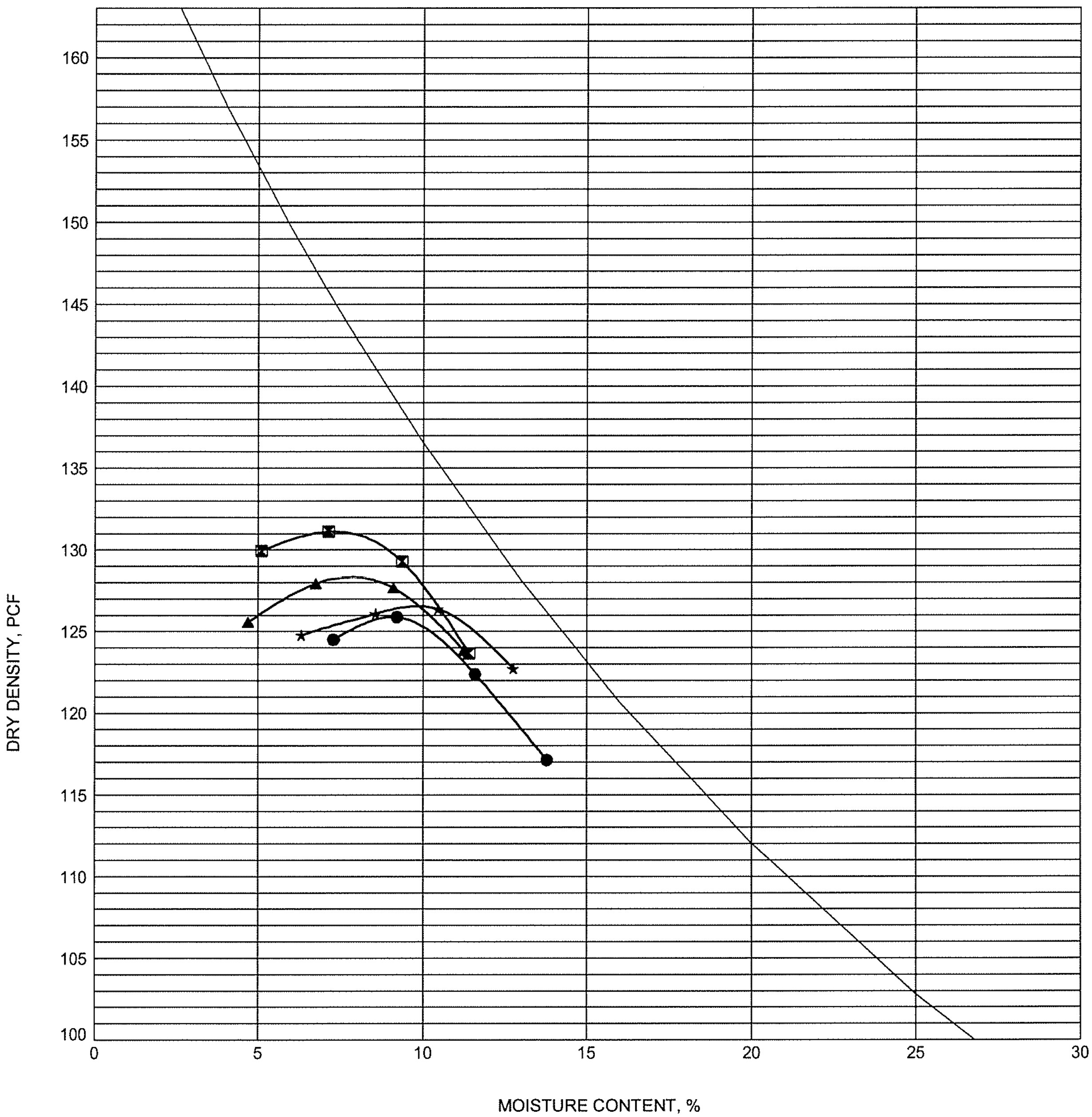
FIGURE NO. B-5



	Specimen Identification		Classification	Max.Density	MC%
●	**B-08**	**0.0**	**SILTY SAND SM**	**126.0**	**10.0**
⊠	**B-08**	**8.5**	**SILTY SAND SM**	**131.5**	**8.0**
▲	**B-08**	**13.0**	**POORLY GRADED SAND with SILT SP-SM**	**129.5**	**8.5**
★	**B-09**	**3.0**	**POORLY GRADED SAND with SILT SP-SM**	**127.0**	**10.0**

PROJECT Geotechnical Exploration
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MAXIMUM DENSITY-OPTIMUM MOISTURE CURVES

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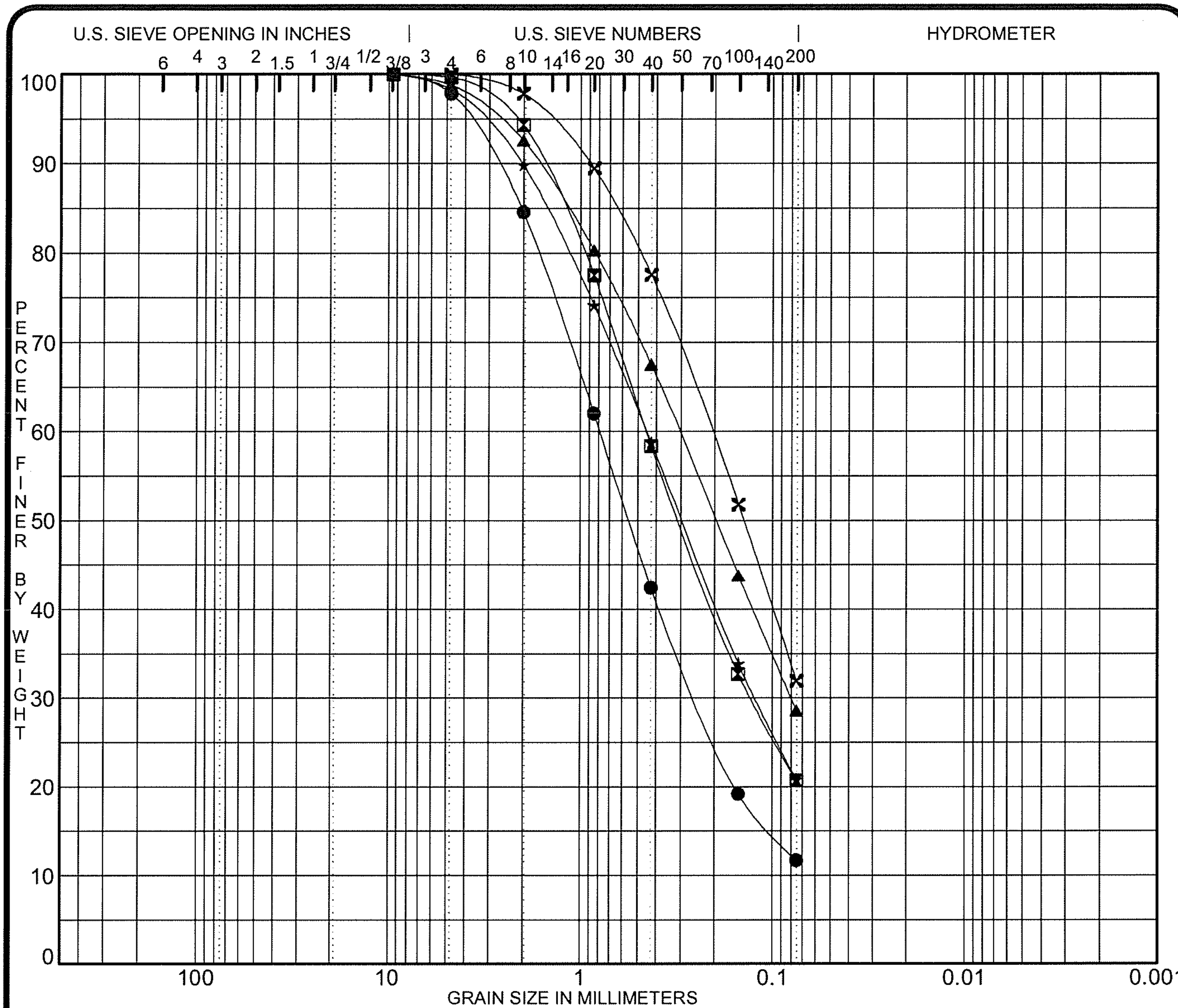
FIGURE NO. B-6



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	S.G.	LL	PL	PI	Cc	Cu
●	B-01	0.0	**WELL-GRADED SAND with SILT SW-SM**		**NP**	**NP**	**NP**	**1.17**	**12.4**
⧗	B-01	15.5	**SILTY SAND SM**		**26**	**24**	**2**		
▲	B-01	21.5	**SILTY, CLAYEY SAND SC-SM**		**28**	**22**	**6**		
★	B-01	27.0	**SILTY SAND SM**		**24**	**21**	**3**		
✕	B-01	38.5	**SILTY SAND SM**		**26**	**25**	**1**		

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-01	0.0	**9.50**	**0.79**	**0.243**		**2.2**	**86.1**	**11.7**	
⧗	B-01	15.5	**9.50**	**0.45**	**0.128**		**0.3**	**79.0**	**20.7**	
▲	B-01	21.5	**9.50**	**0.31**	**0.080**		**1.2**	**70.2**	**28.6**	
★	B-01	27.0	**9.50**	**0.45**	**0.122**		**1.7**	**77.5**	**20.8**	
✕	B-01	38.5	**4.75**	**0.21**			**0.0**	**68.1**	**31.9**	

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GRADATION CURVES

Inland Foundation Engineering, Inc.
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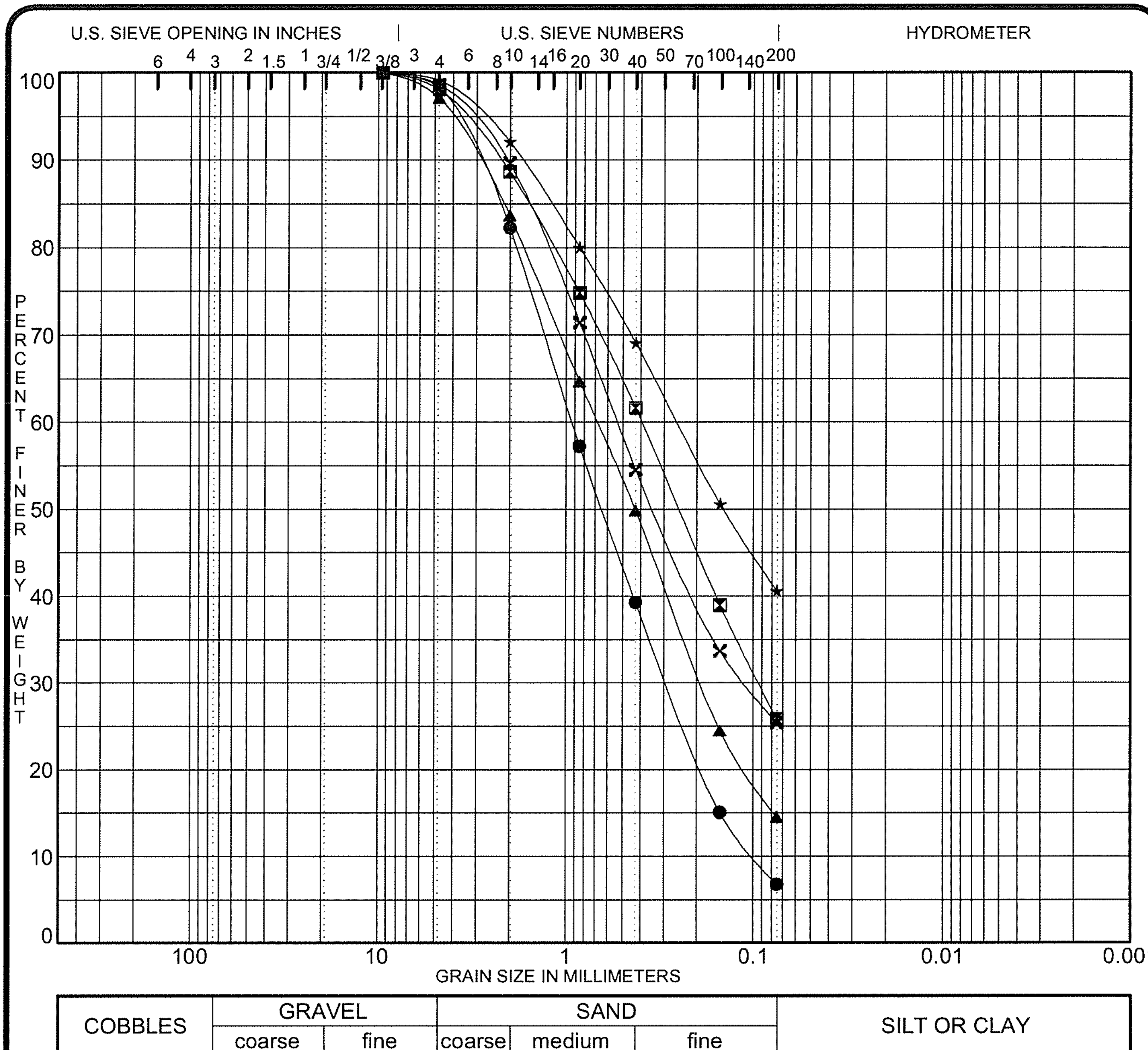
FIGURE NO. B-7



Symbol	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	**B-02**	**7.5**	**POORLY GRADED SAND with SILT SP-SM**		**NP**	**NP**	**NP**	**0.89**	**9.5**
⊠	**B-02**	**10.5**	**SILTY SAND SM**		**26**	**23**	**3**		
▲	**B-03**	**0.0**	**SILTY SAND SM**		**22**	**21**	**1**		
★	**B-03**	**7.0**	**SILTY, CLAYEY SAND SC-SM**		**25**	**18**	**7**		
✕	**B-03**	**12.5**	**CLAYEY SAND SC**		**28**	**17**	**11**		

Symbol	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-02**	**7.5**	**9.50**	**0.93**	**0.285**	**0.0981**	**1.6**	**91.6**	**6.8**	
⊠	**B-02**	**10.5**	**9.50**	**0.39**	**0.093**		**1.9**	**72.2**	**25.9**	
▲	**B-03**	**0.0**	**9.50**	**0.68**	**0.188**		**2.9**	**82.5**	**14.5**	
★	**B-03**	**7.0**	**9.50**	**0.25**			**0.9**	**58.5**	**40.6**	
✕	**B-03**	**12.5**	**9.50**	**0.53**	**0.110**		**1.4**	**73.2**	**25.4**	

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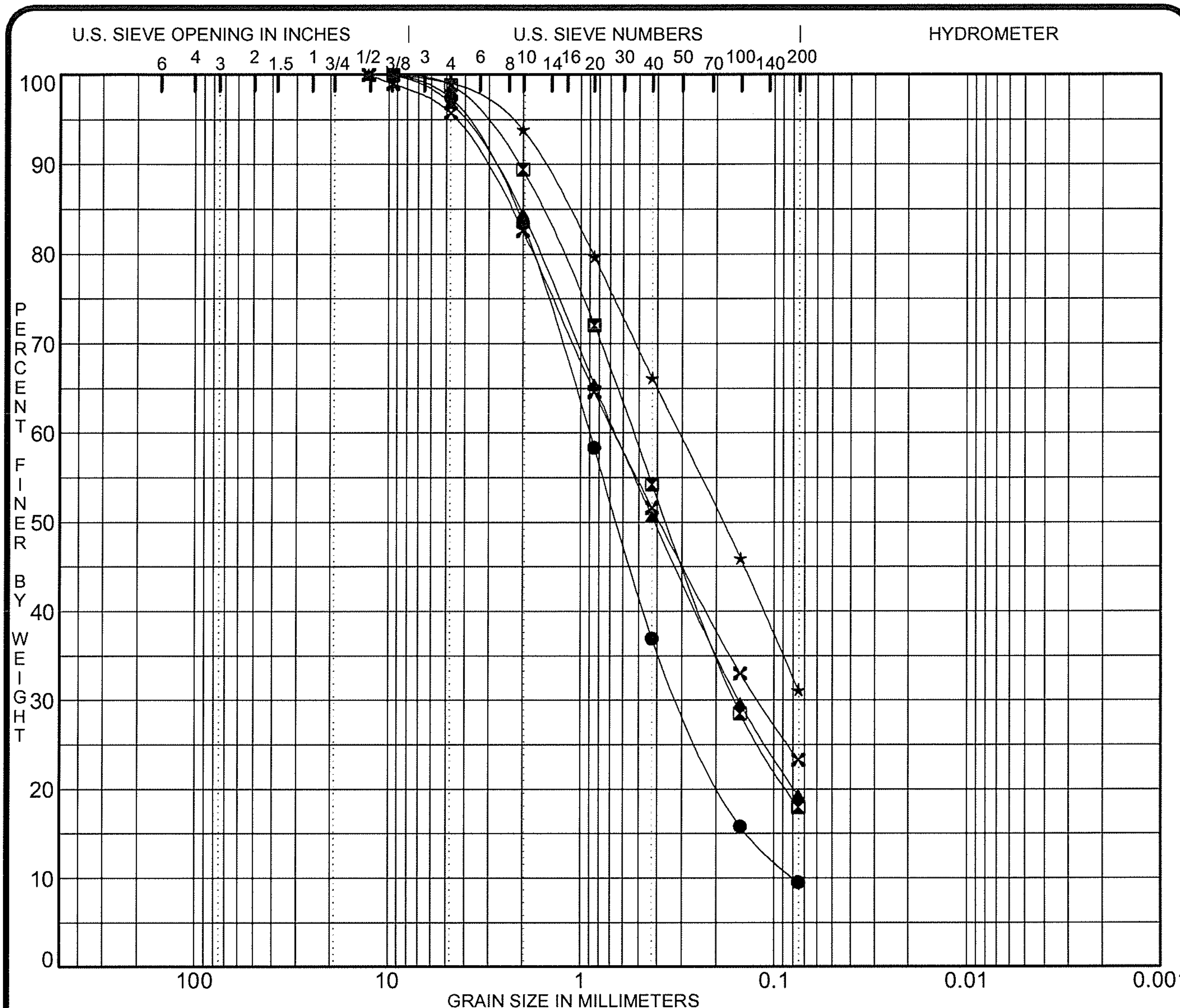
FIGURE NO. B-8



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	B-03	18.5	**WELL-GRADED SAND with SILT SW-SM**		25	22	3	1.28	11.4
⊠	B-03	22.0	**SILTY SAND SM**		24	21	3		
▲	B-04	3.3	**SILTY, CLAYEY SAND SC-SM**		25	20	5		
★	B-04	12.5	**SILTY SAND SM**		28	24	4		
✕	B-04	16.5	**SILTY SAND SM**		25	23	2		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-03	18.5	9.50	0.90	0.302	0.0790	2.6	87.9	9.5	
⊠	B-03	22.0	9.50	0.53	0.159		1.2	80.9	18.0	
▲	B-04	3.3	12.70	0.66	0.153		3.2	77.5	19.3	
★	B-04	12.5	9.50	0.31			1.0	67.9	31.1	
✕	B-04	16.5	12.70	0.67	0.121		4.3	72.4	23.3	

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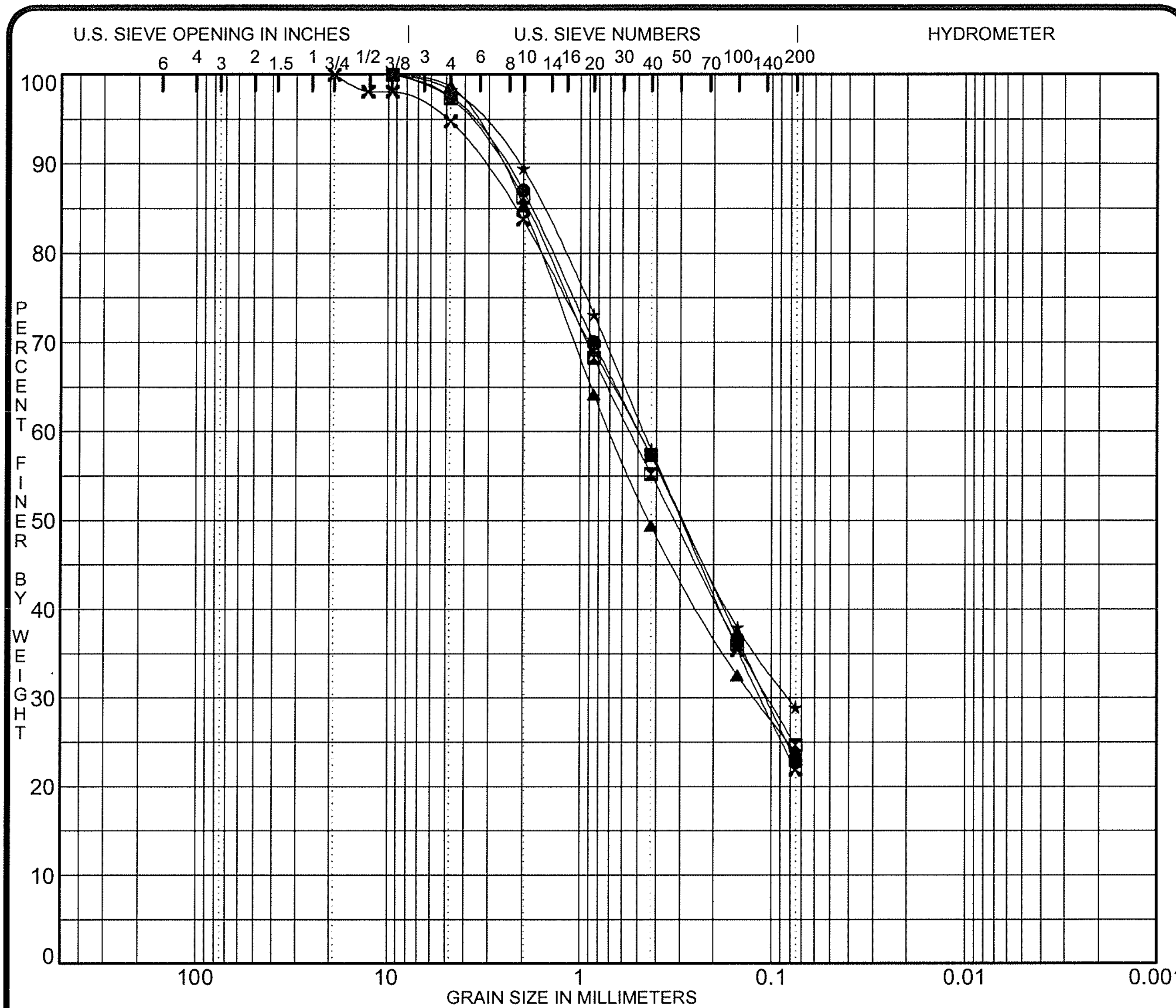
FIGURE NO. B-9



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	B-04	20.5	**SILTY SAND SM**		24	21	3		
⧗	B-04	29.5	**SILTY, CLAYEY SAND SC-SM**		26	20	6		
▲	B-04	37.5	**SILTY SAND SM**		27	24	3		
★	B-04	45.5	**SILTY SAND SM**		26	22	4		
✕	B-04	50.5	**SILTY SAND SM**		26	24	2		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-04	20.5	9.50	0.49	0.107		2.4	74.6	22.9	
⧗	B-04	29.5	9.50	0.55	0.104		2.6	72.7	24.7	
▲	B-04	37.5	9.50	0.70	0.122		1.3	74.7	24.0	
★	B-04	45.5	9.50	0.47	0.082		1.7	69.4	28.9	
✕	B-04	50.5	19.00	0.50	0.114		5.3	72.9	21.9	

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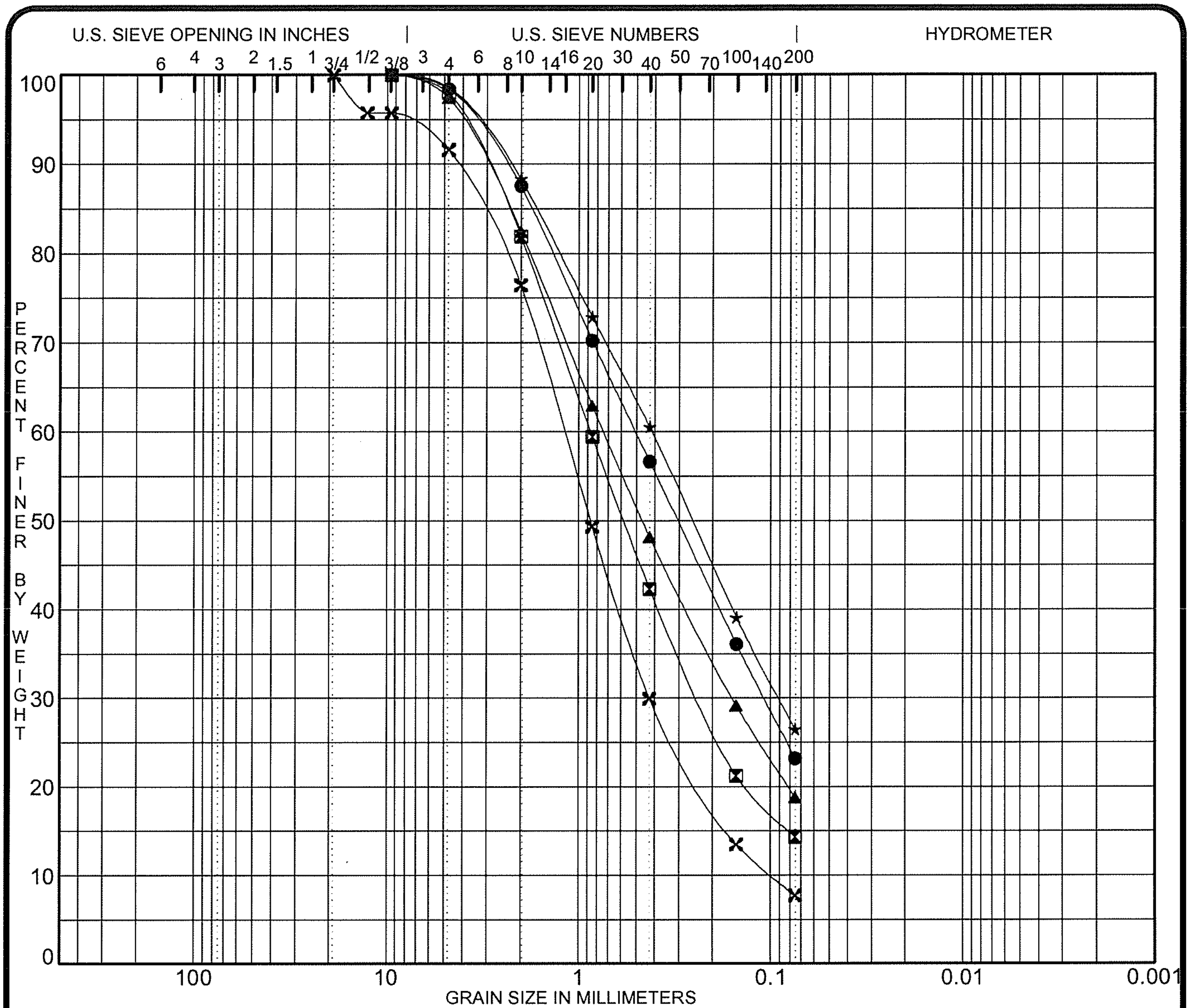
FIGURE NO. B-10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	S.G.	LL	PL	PI	Cc	Cu
●	B-05	3.0	**CLAYEY SAND SC**		29	21	8		
⌧	B-05	23.5	**SILTY SAND SM**		24	21	3		
▲	B-05	28.5	**SILTY, CLAYEY SAND SC-SM**		25	21	4		
★	B-05	35.5	**SILTY SAND SM**		25	22	3		
✕	B-05	40.5	**WELL-GRADED SAND with SILT SW-SM**		NP	NP	NP	1.54	12.1

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-05	3.0	9.50	0.50	0.108		1.6	75.2	23.2	
⌧	B-05	23.5	9.50	0.87	0.231		2.0	83.6	14.3	
▲	B-05	28.5	9.50	0.74	0.157		2.6	78.6	18.8	
★	B-05	35.5	9.50	0.41	0.091		1.4	72.1	26.5	
✕	B-05	40.5	19.00	1.19	0.426	0.0987	8.4	83.9	7.7	

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GRADATION CURVES

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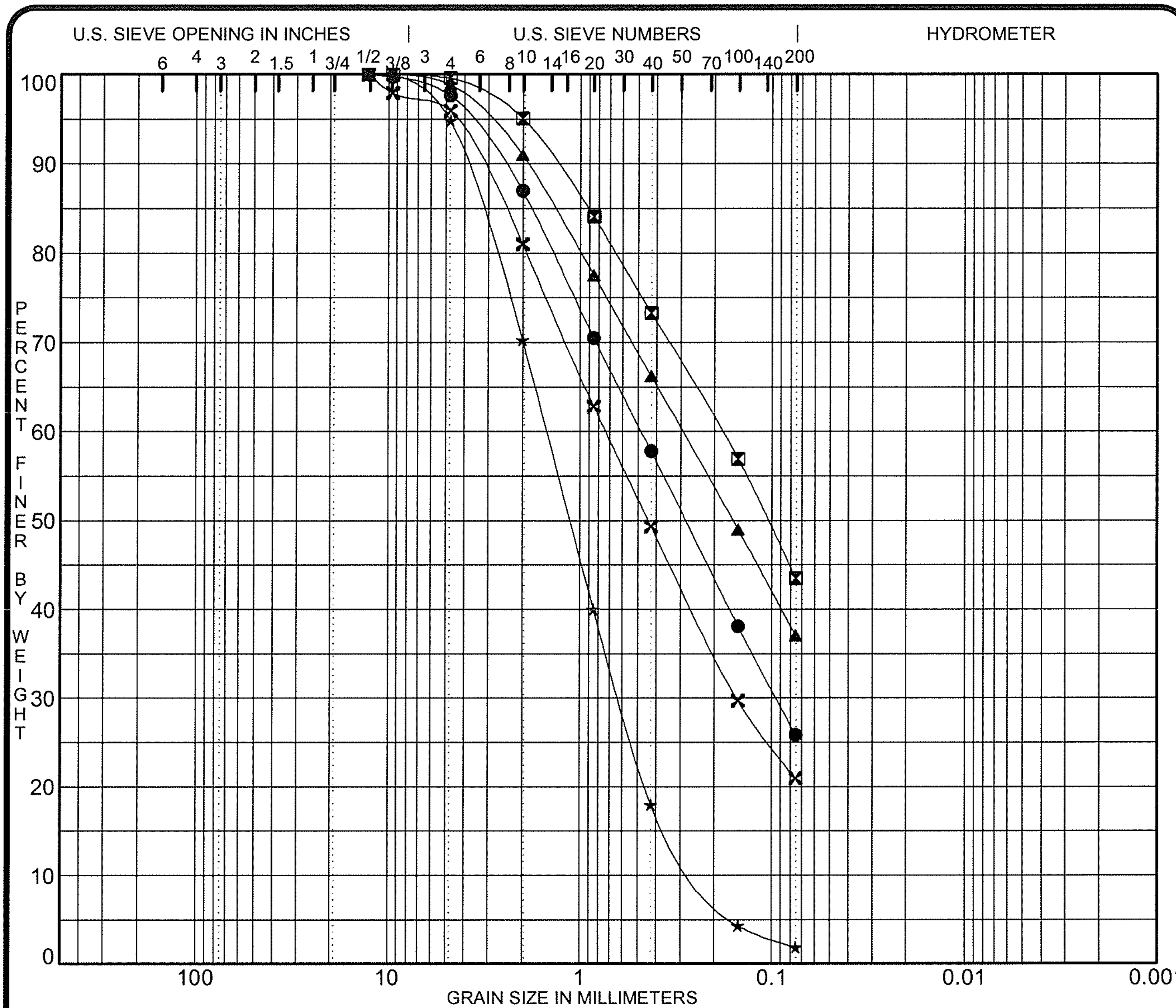
FIGURE NO. B-11



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	**B-06**	**2.5**	**SILTY, CLAYEY SAND SC-SM**		**27**	**20**	**7**		
⊠	**B-06**	**16.5**	**CLAYEY SAND SC**		**30**	**21**	**9**		
▲	**B-06**	**21.5**	**SILTY, CLAYEY SAND SC-SM**		**26**	**19**	**7**		
★	**B-06**	**26.5**	**WELL-GRADED SAND SW**		**NP**	**NP**	**NP**	**1.11**	**6.5**
✕	**B-06**	**31.5**	**SILTY SAND SM**		**27**	**22**	**5**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-06**	**2.5**	**12.70**	**0.48**	**0.095**		**2.4**	**71.8**	**25.9**	
⊠	**B-06**	**16.5**	**9.50**	**0.18**			**0.4**	**56.1**	**43.5**	
▲	**B-06**	**21.5**	**9.50**	**0.29**			**1.2**	**61.8**	**37.0**	
★	**B-06**	**26.5**	**9.50**	**1.50**	**0.620**	**0.2313**	**5.2**	**92.9**	**1.9**	
✕	**B-06**	**31.5**	**12.70**	**0.74**	**0.152**		**4.1**	**75.0**	**20.9**	

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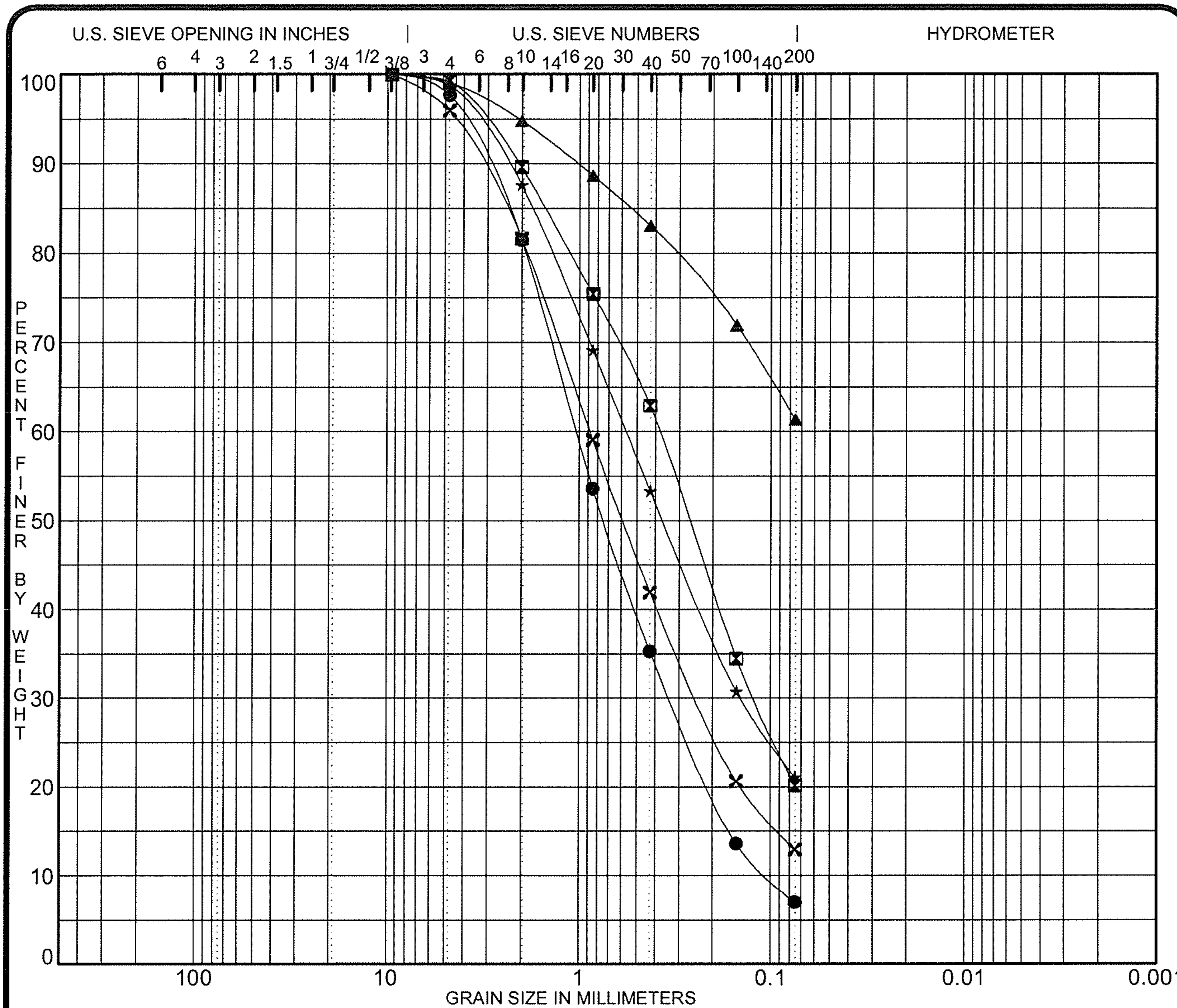
FIGURE NO. B-12



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	**B-07**	**10.5**	**WELL-GRADED SAND with SILT SW-SM**		**NP**	**NP**	**NP**	**1.02**	**10.1**
⌧	**B-07**	**14.5**	**SILTY SAND SM**		**25**	**24**	**1**		
▲	**B-07**	**18.0**	**SANDY LEAN CLAY CL**		**32**	**22**	**10**		
★	**B-07**	**20.0**	**SILTY, CLAYEY SAND SC-SM**		**26**	**21**	**5**		
✕	**B-07**	**24.5**	**SILTY SAND SM**		**23**	**23**	**NP**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-07**	**10.5**	**9.50**	**1.03**	**0.330**	**0.1025**	**2.3**	**90.6**	**7.0**	
⌧	**B-07**	**14.5**	**9.50**	**0.38**	**0.121**		**0.8**	**79.1**	**20.1**	
▲	**B-07**	**18.0**	**9.50**				**1.0**	**37.7**	**61.4**	
★	**B-07**	**20.0**	**9.50**	**0.57**	**0.142**		**1.2**	**77.7**	**21.1**	
✕	**B-07**	**24.5**	**9.50**	**0.88**	**0.237**		**4.1**	**83.0**	**13.0**	

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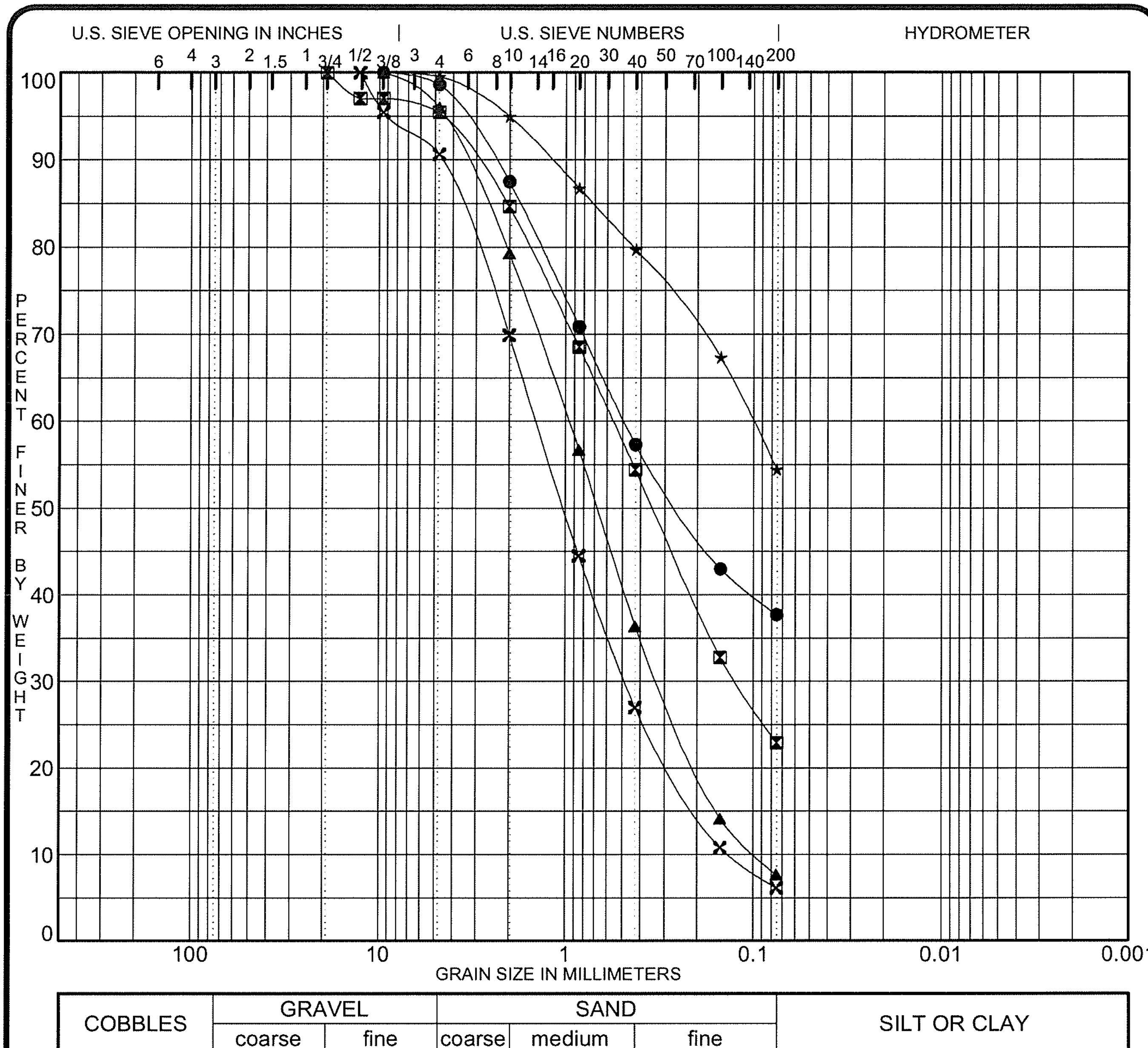
FIGURE NO. B-13



Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
● B-07	29.0	**CLAYEY SAND SC**		29	19	10		
⧗ B-07	32.0	**SILTY SAND SM**		25	24	1		
▲ B-07	35.5	**WELL-GRADED SAND with SILT SW-SM**		NP	NP	NP	1.07	10.0
★ B-07	38.5	**SANDY SILT ML**		30	26	4		
✕ B-07	43.5	**WELL-GRADED SAND with SILT SW-SM**		NP	NP	NP	1.20	10.8

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-07	29.0	9.50	0.49			1.4	60.9	37.7	
⧗ B-07	32.0	19.00	0.56	0.124		4.6	72.5	22.9	
▲ B-07	35.5	9.50	0.96	0.315	0.0960	4.0	88.3	7.7	
★ B-07	38.5	9.50	0.10			0.4	45.1	54.4	
✕ B-07	43.5	12.70	1.43	0.479	0.1330	9.4	84.5	6.1	

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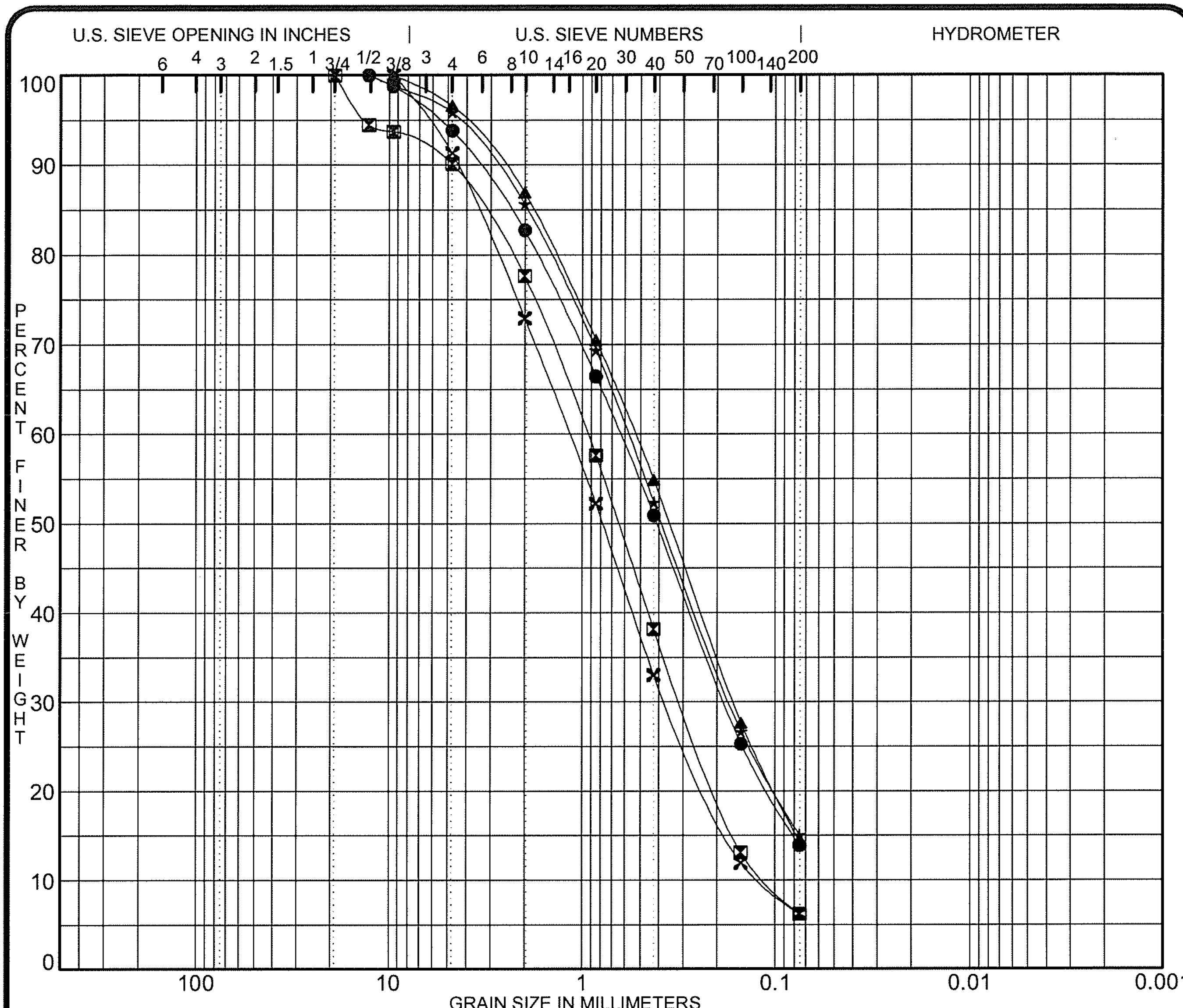
FIGURE NO. B-14



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
● B-08	0.0	**SILTY SAND SM**		23	21	2		
⧗ B-08	18.5	**POORLY GRADED SAND with SILT SP-SM**		NP	NP	NP	0.89	8.6
▲ B-08	21.5	**SILTY SAND SM**		23	20	3		
★ B-08	25.5	**SILTY SAND SM**		26	22	4		
✕ B-08	28.5	**POORLY GRADED SAND with SILT SP-SM**		NP	NP	NP	0.96	9.9

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-08	0.0	12.70	0.64	0.182		6.2	79.9	13.9	
⧗ B-08	18.5	19.00	0.94	0.303	0.1099	9.9	83.9	6.2	
▲ B-08	21.5	9.50	0.53	0.164		3.4	82.3	14.3	
★ B-08	25.5	12.70	0.58	0.172		4.1	80.8	15.1	
✕ B-08	28.5	9.50	1.17	0.366	0.1187	8.7	85.1	6.2	

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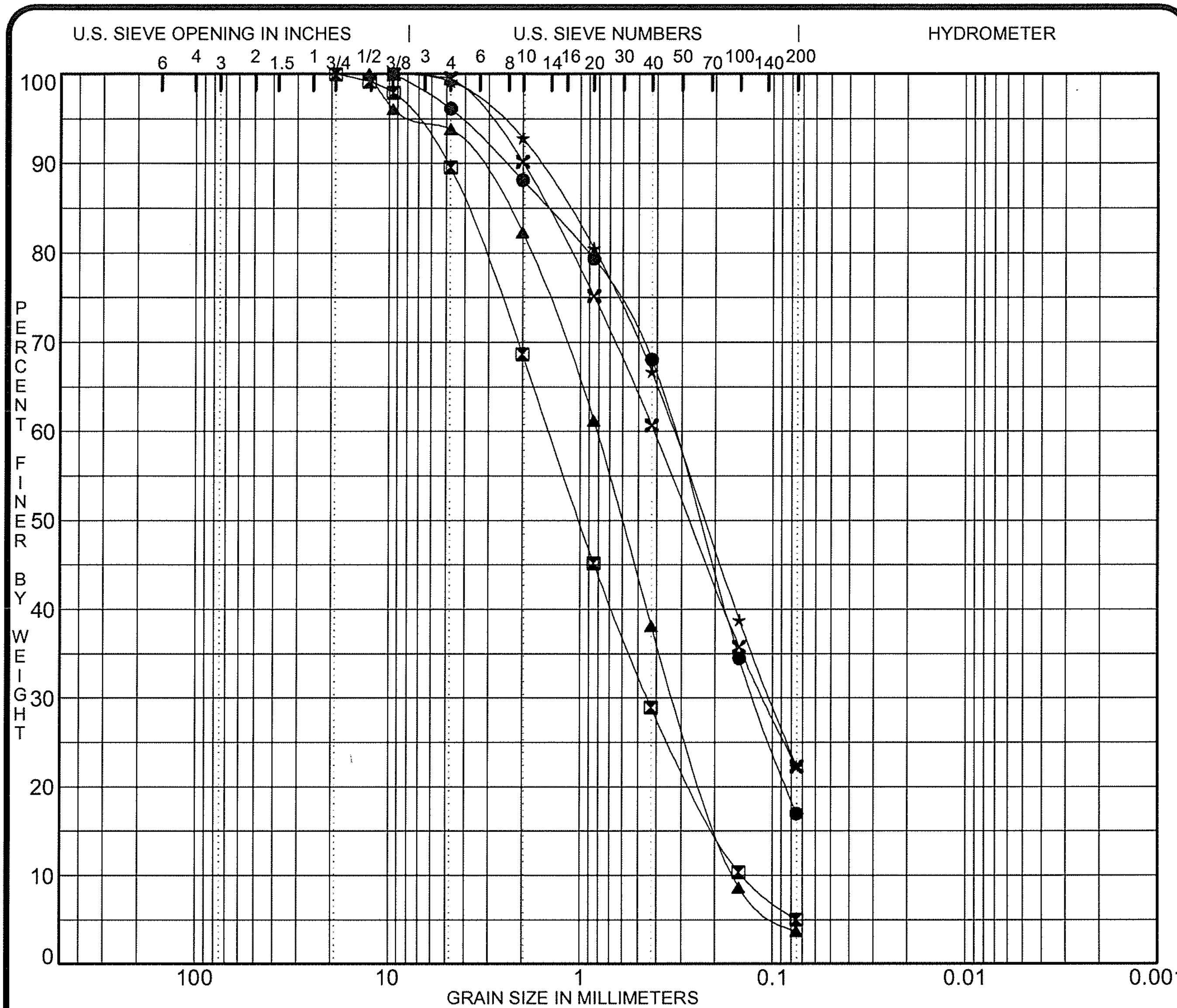
FIGURE NO. B-15



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	**B-08**	**31.5**	**SILTY SAND SM**		**30**	**27**	**3**		
⧗	**B-09**	**3.0**	**POORLY GRADED SAND with SILT SP-SM**		**NP**	**NP**	**NP**	**0.95**	**10.2**
▲	**B-09**	**19.5**	**POORLY GRADED SAND SP**		**NP**	**NP**	**NP**	**0.79**	**5.2**
★	**B-09**	**23.5**	**SILTY SAND SM**		**26**	**24**	**2**		
✕	**B-09**	**27.5**	**SILTY SAND SM**		**25**	**25**	**NP**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-08**	**31.5**	**9.50**	**0.33**	**0.126**		**3.9**	**79.2**	**17.0**	
⧗	**B-09**	**3.0**	**19.00**	**1.46**	**0.445**	**0.1429**	**10.4**	**84.6**	**5.0**	
▲	**B-09**	**19.5**	**12.70**	**0.82**	**0.319**	**0.1573**	**6.2**	**90.1**	**3.7**	
★	**B-09**	**23.5**	**9.50**	**0.33**	**0.104**		**0.8**	**76.9**	**22.3**	
✕	**B-09**	**27.5**	**9.50**	**0.41**	**0.112**		**0.5**	**77.3**	**22.3**	

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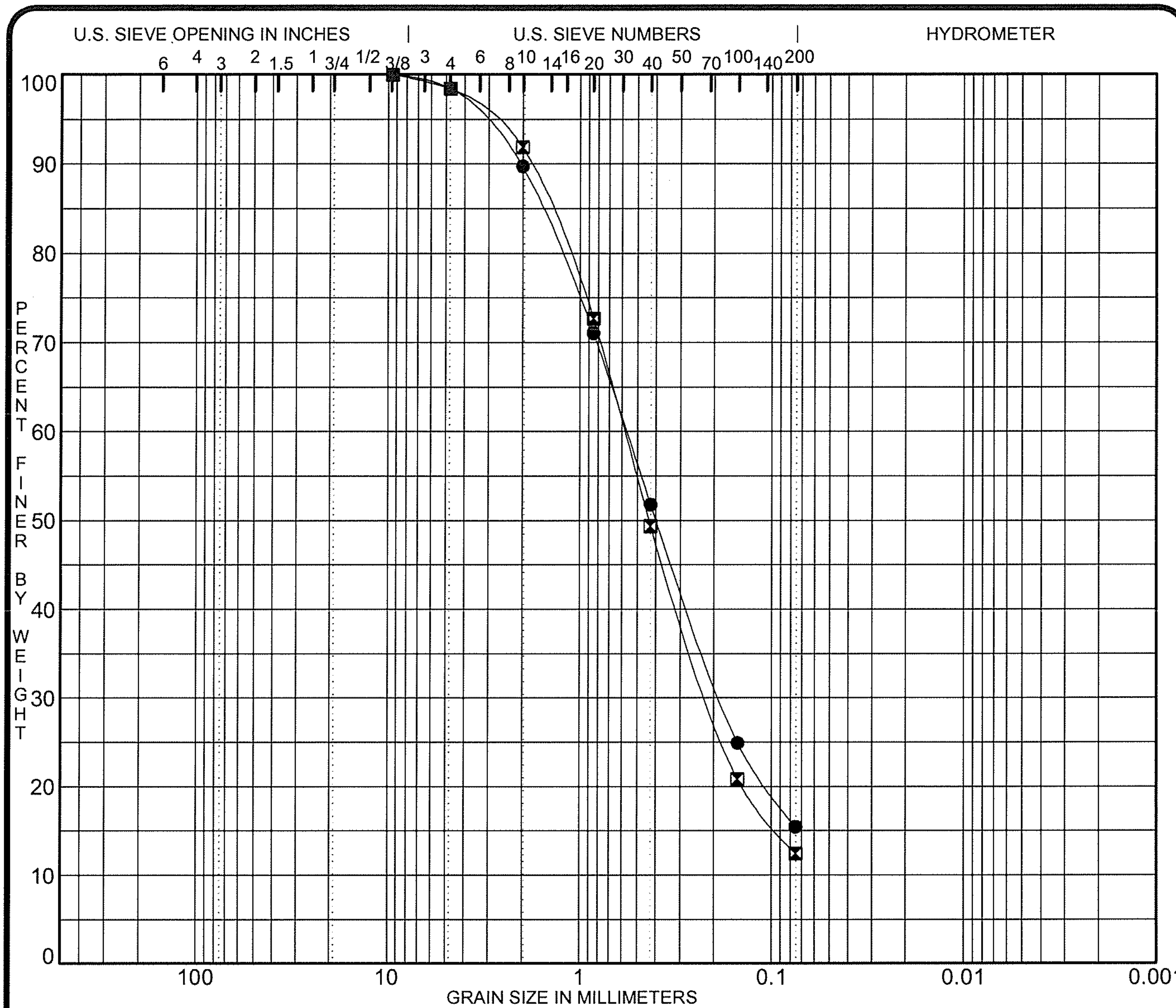
FIGURE NO. B-16



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	S.G.	LL	PL	PI	Cc	Cu
●	**B-09**	**34.0**	**SILTY SAND SM**		**26**	**23**	**3**		
⌧	**B-09**	**38.5**	**SILTY, CLAYEY SAND SC-SM**		**28**	**21**	**7**	**1.23**	**9.5**

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**B-09**	**34.0**	**9.50**	**0.57**	**0.183**		**1.6**	**83.0**	**15.5**	
⌧	**B-09**	**38.5**	**9.50**	**0.58**	**0.210**		**1.6**	**86.0**	**12.4**	

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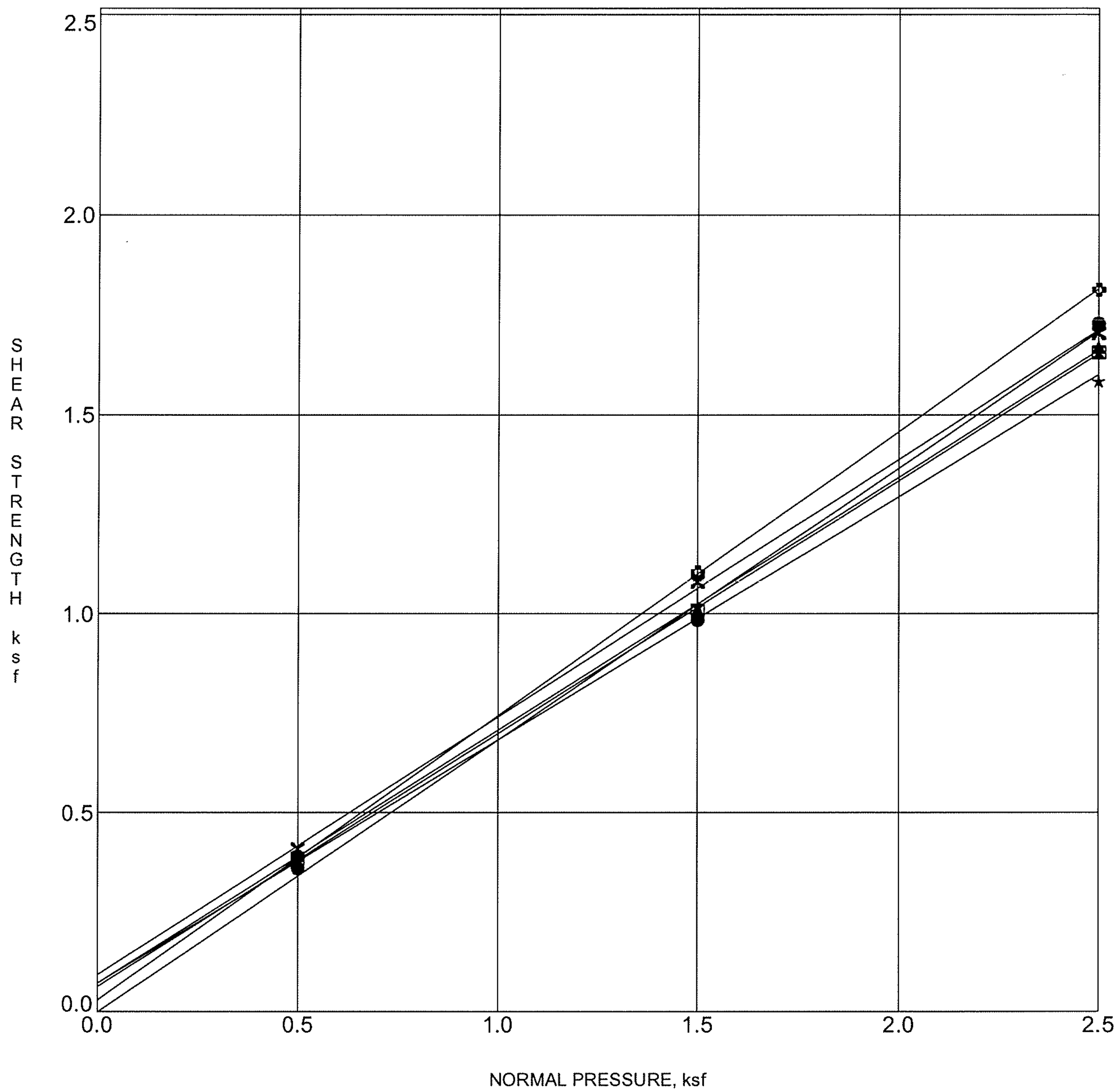
FIGURE NO. B-17



Specimen Identification			Classification	Phi	Cohesion	DD	MC%
●	**B-01**	**0.0**	**WELL-GRADED SAND with SILT SW-SM**	**34**	**0.000**	**114**	**16**
⊠	**B-03**	**0.0**	**SILTY SAND SM**	**32**	**0.062**	**116**	**16**
▲	**B-04**	**3.3**	**SILTY, CLAYEY SAND SC-SM**	**32**	**0.070**	**119**	**15**
★	**B-05**	**3.0**	**CLAYEY SAND SC**	**31**	**0.070**	**120**	**15**
✕	**B-06**	**2.5**	**SILTY, CLAYEY SAND SC-SM**	**33**	**0.092**	**118**	**15**
✿	**B-07**	**2.5**	**SILTY SAND SM**	**36**	**0.029**	**124**	**15**

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SHEAR TEST DIAGRAM

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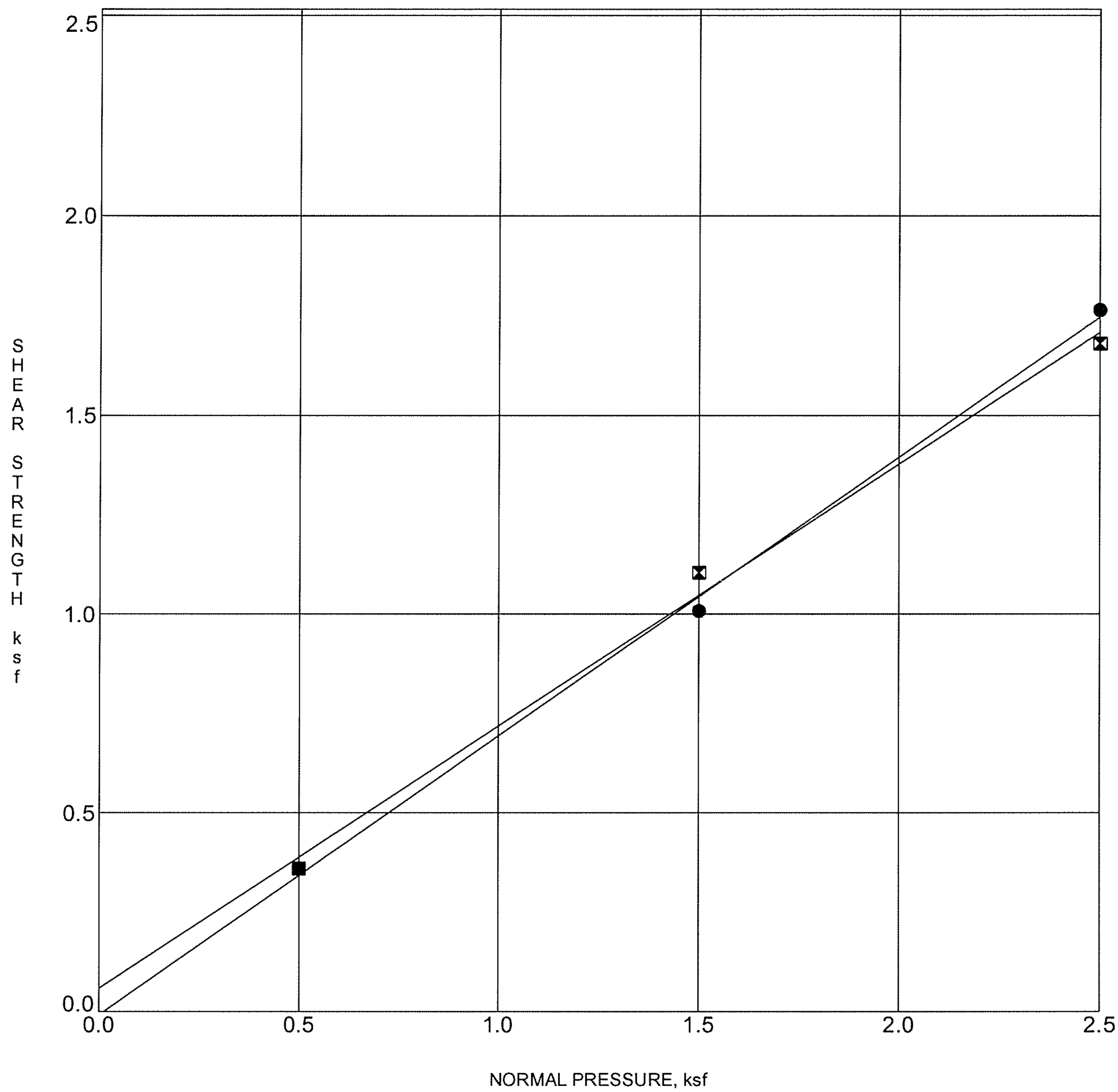
FIGURE NO. B-18



Specimen Identification			Classification	Phi	Cohesion	DD	MC%
●	B-08	0.0	SILTY SAND SM	35	0.000	113	17
⊠	B-09	3.0	POORLY GRADED SAND with SILT SP-SM	33	0.058	114	16

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SHEAR TEST DIAGRAM

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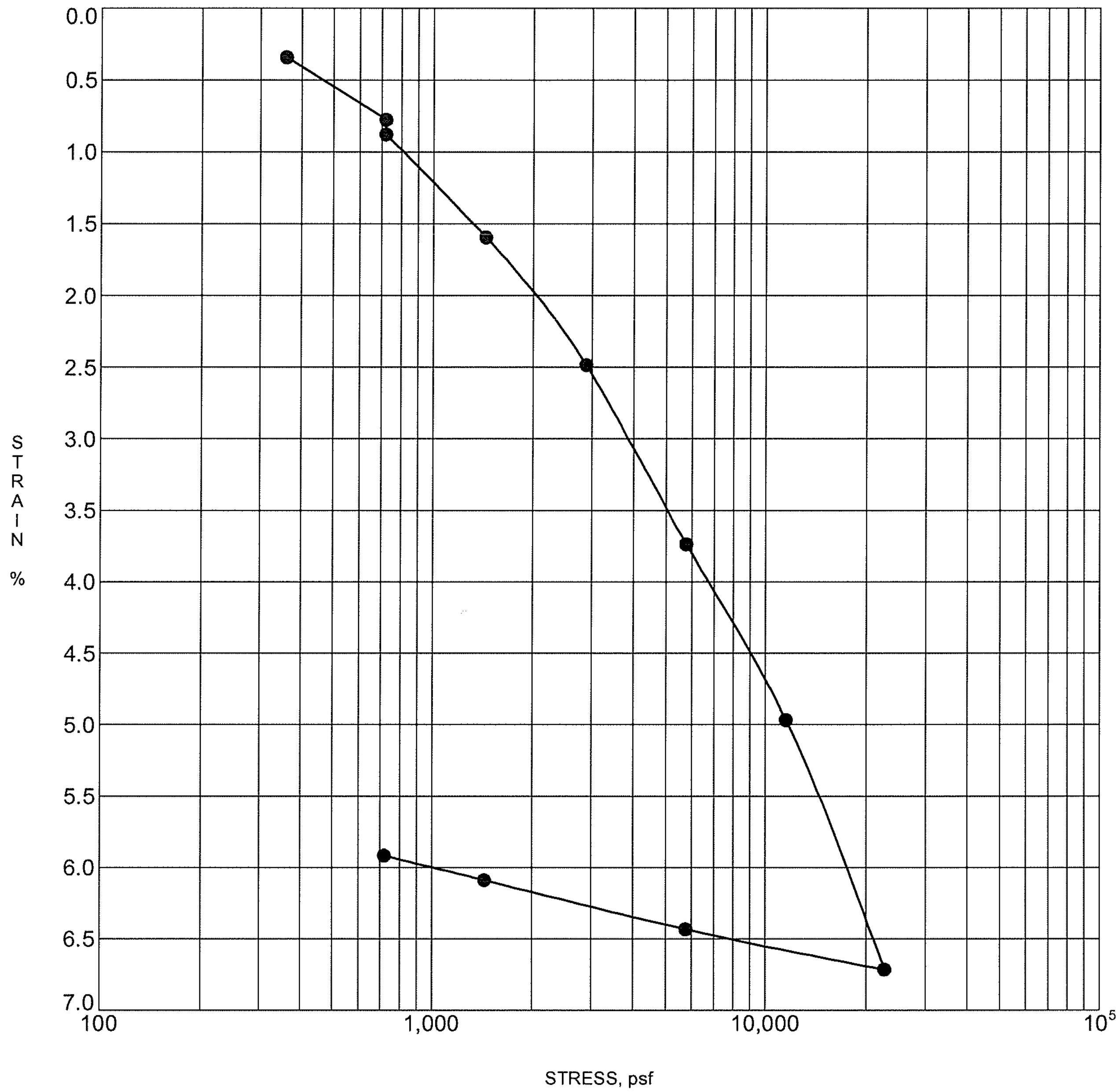
FIGURE NO. B-19



	Specimen Identification		Classification	DD	MC%
●	**B-09**	**7.5**	**POORLY GRADED SAND with SILT SP-SM**	**103**	**2**
⊠					
▲					
★					
✖					
✿					

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CONSOLIDATION TEST

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FIGURE NO. B-20

EXPANSION TEST SUMMARY

Sample Location	Sample Depth	Initial Dry Density	Initial Moisture Content, %	Final Moisture Content, %	Expansion Index
B-06	2.5-3.5	117.2	7.2	14.9	8

GENERAL

All laboratory testing has been conducted in conformance with the applicable ASTM test methods by personnel trained and supervised in conformance with our QA/QC policy. Our test data only relates to the specific soils tested. Soil conditions typically vary and any significant variations should be reported to our laboratory for review and possible testing. The data presented in this report are for the use of Camp Ronald McDonald for Good Times only and may not be reproduced or used by others without written approval of Inland Foundation Engineering, Inc.

APPENDIX C –
2020 Liquefaction Analysis

TABLE OF CONTENTS

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

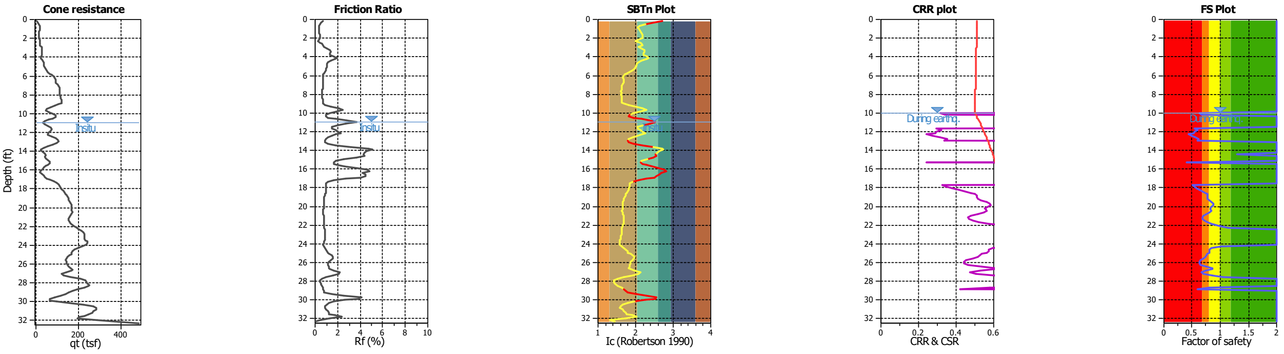
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

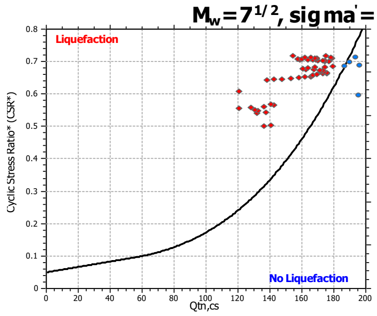
CPT file : 372CPT-01

Input parameters and analysis data

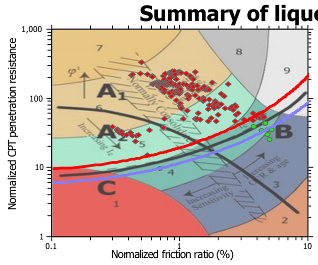
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	11.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



M_w=7$^{1/2}$, sigma'=1 atm base curve

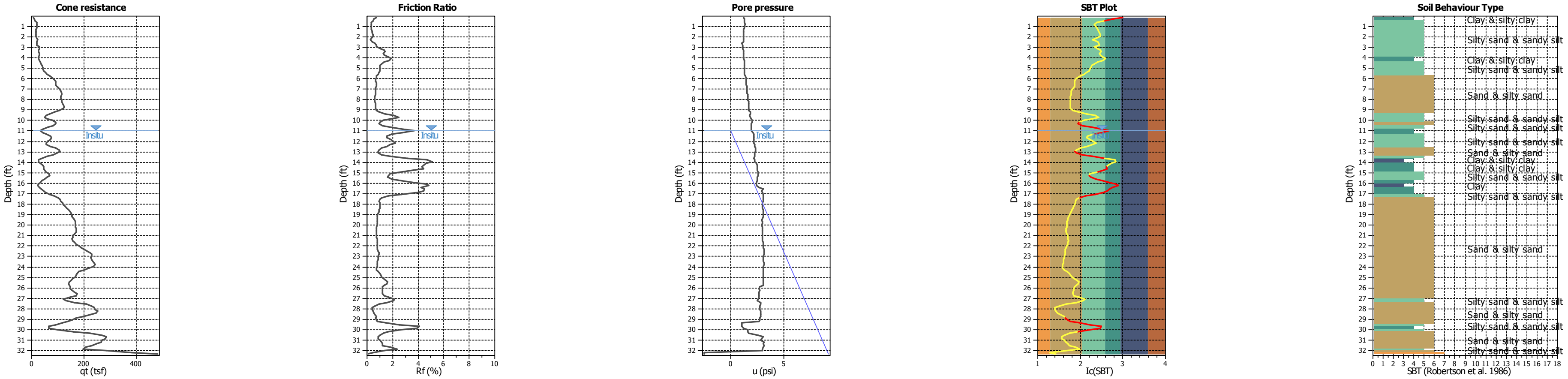


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



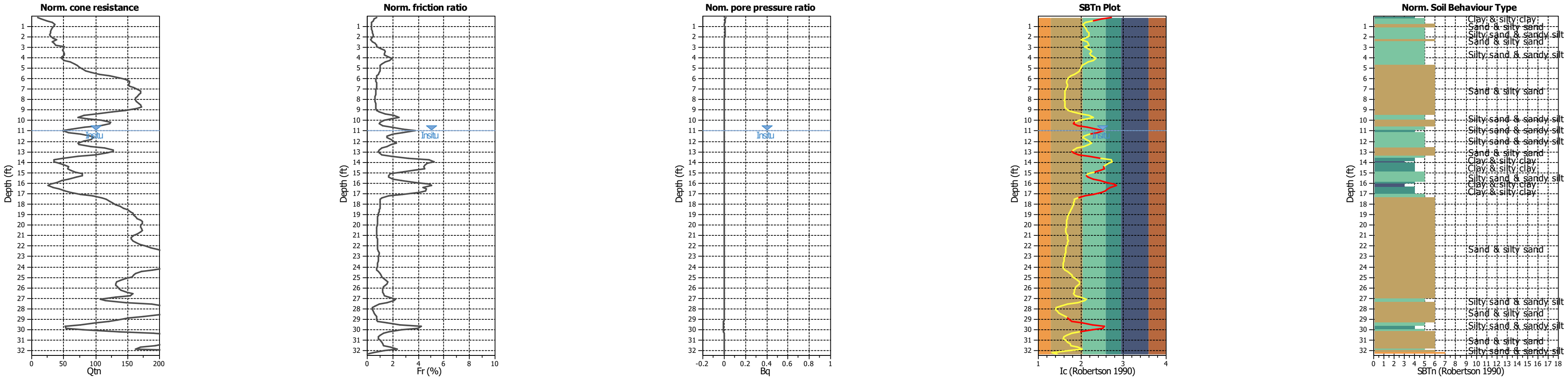
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

CPT basic interpretation plots (normalized)



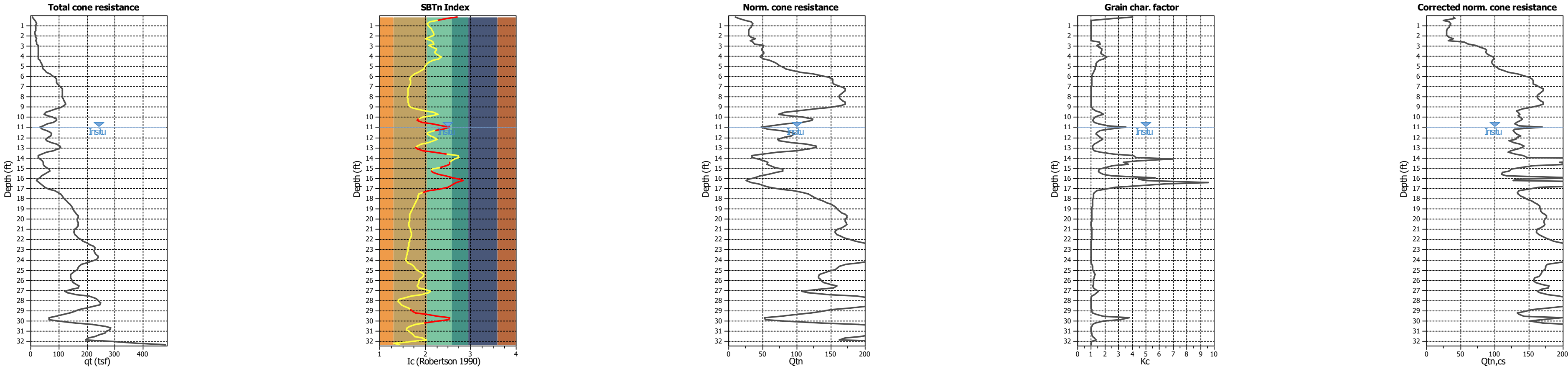
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

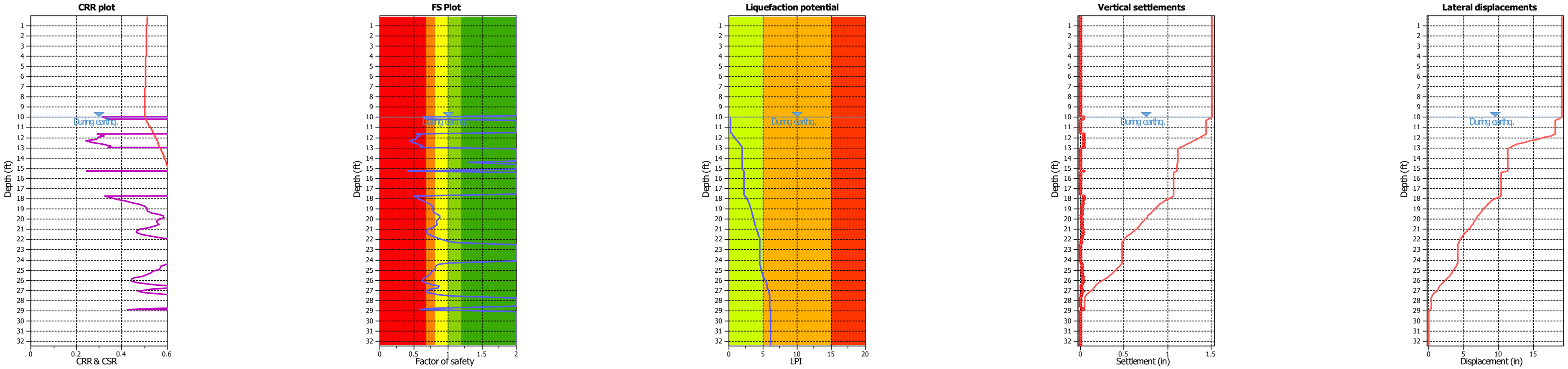
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

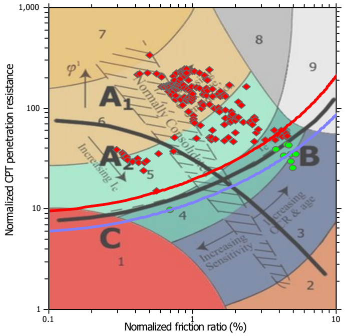
F.S. color scheme

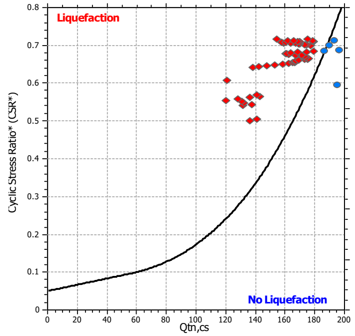
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

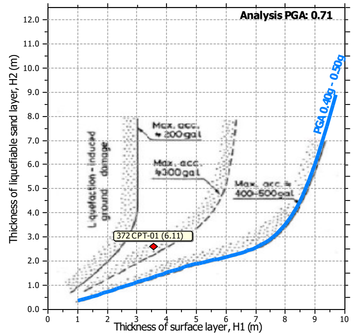
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



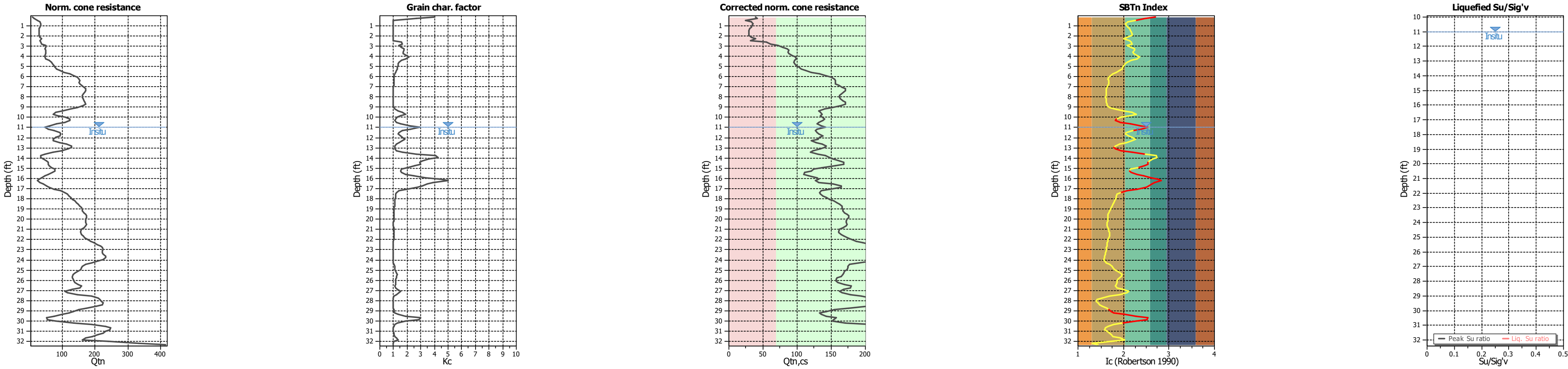




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	11.00 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
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San Jacinto, California

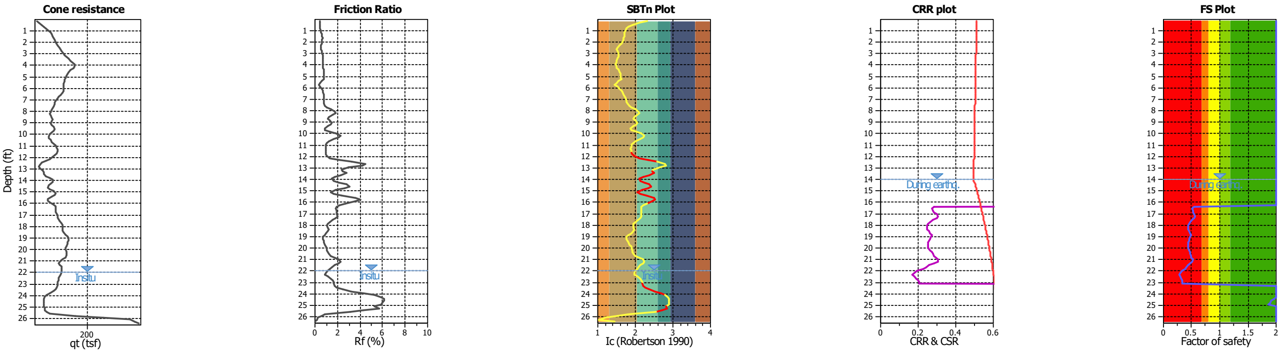
LIQUEFACTION ANALYSIS REPORT

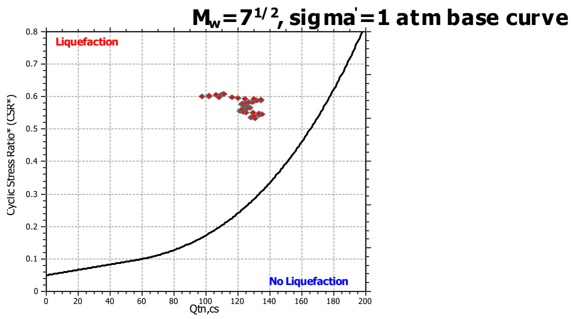
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

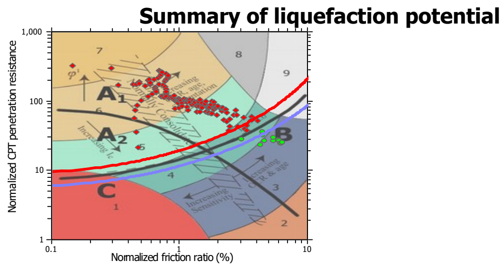
CPT file : 372CPT-02

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	22.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

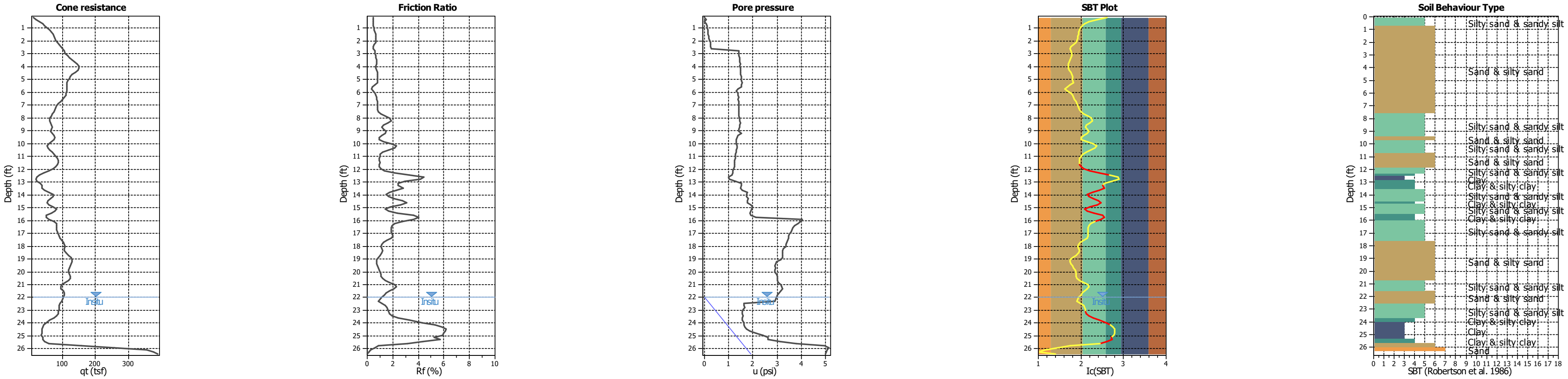






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



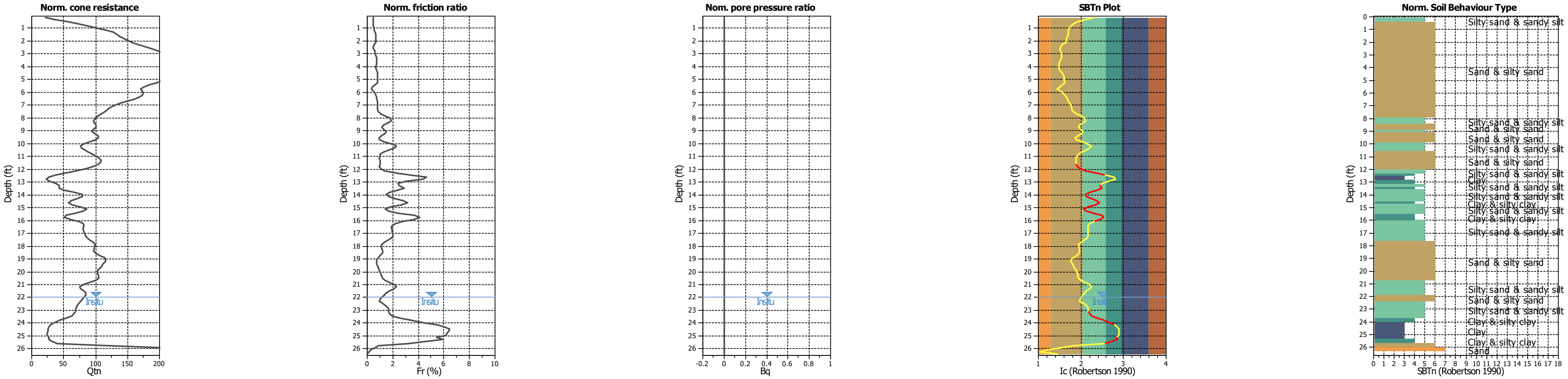
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



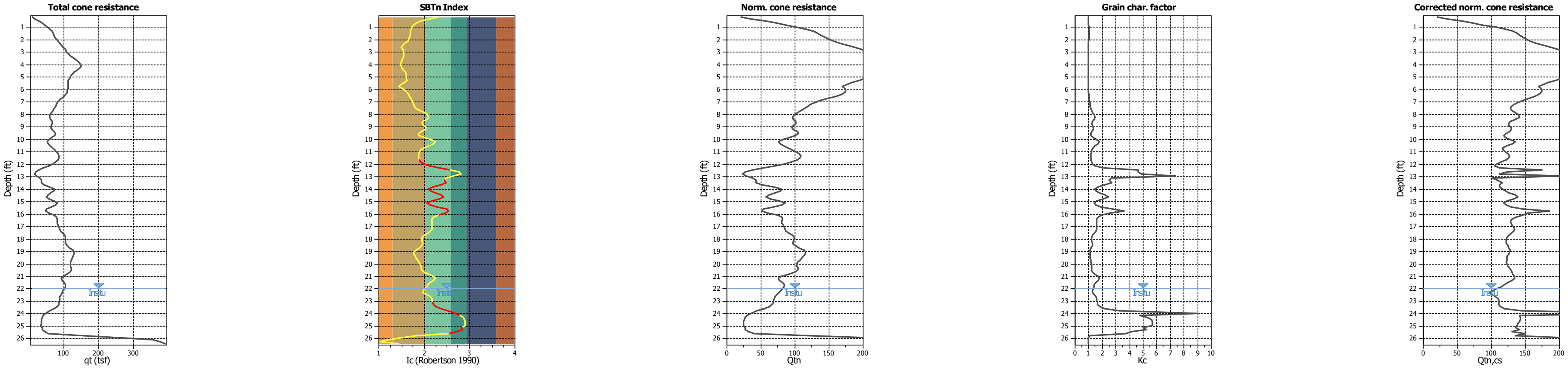
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A		

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

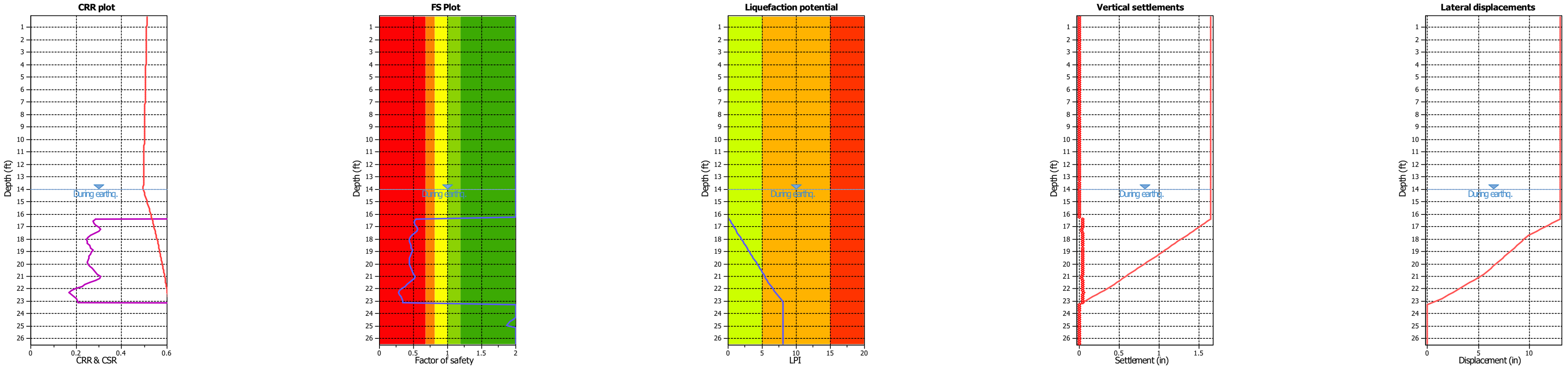
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

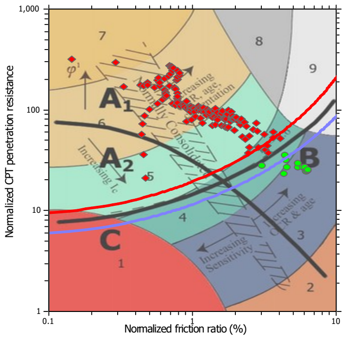
F.S. color scheme

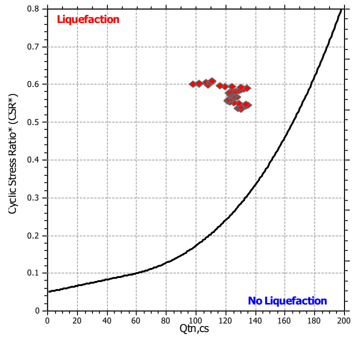
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

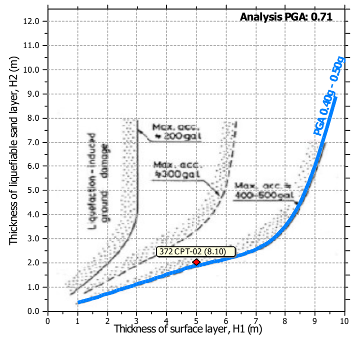
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



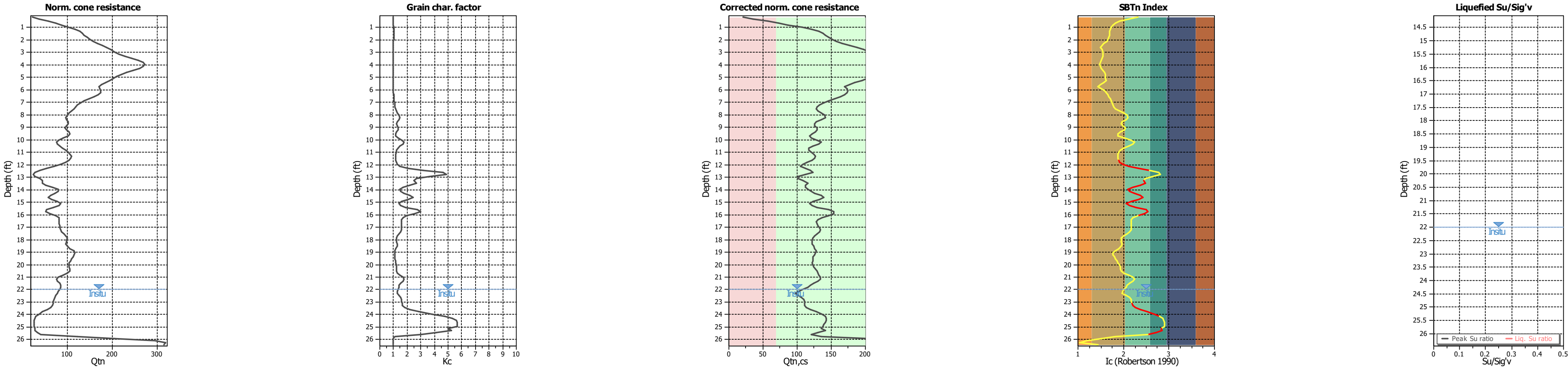




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

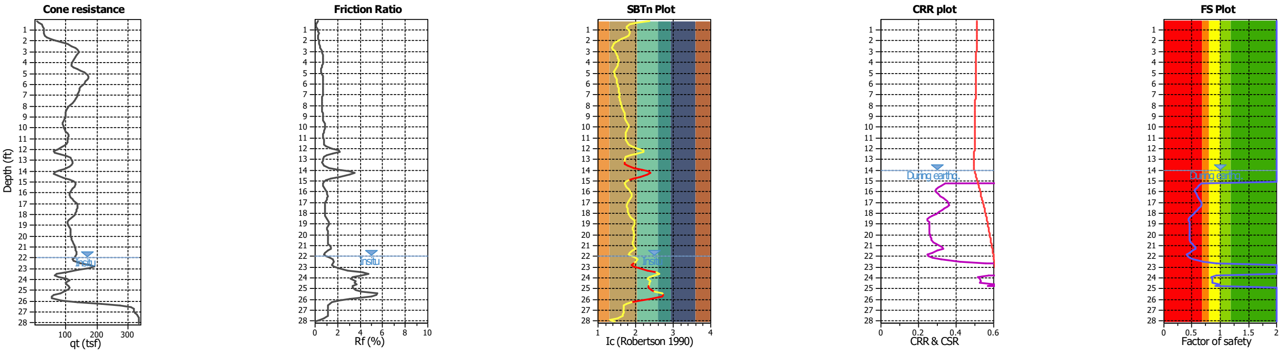
LIQUEFACTION ANALYSIS REPORT

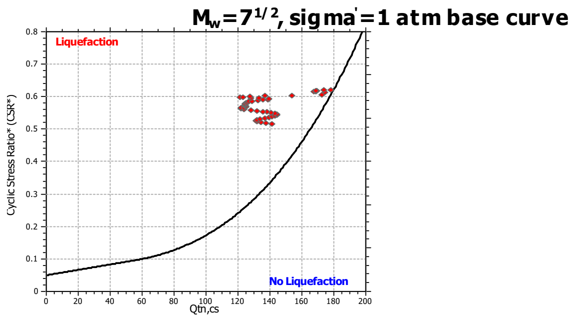
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

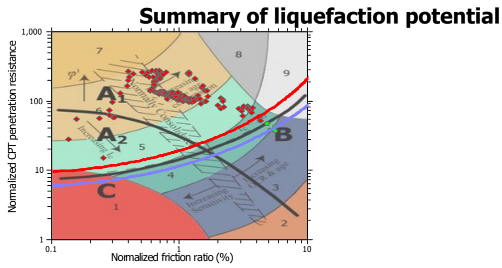
CPT file : 372CPT-03

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	22.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

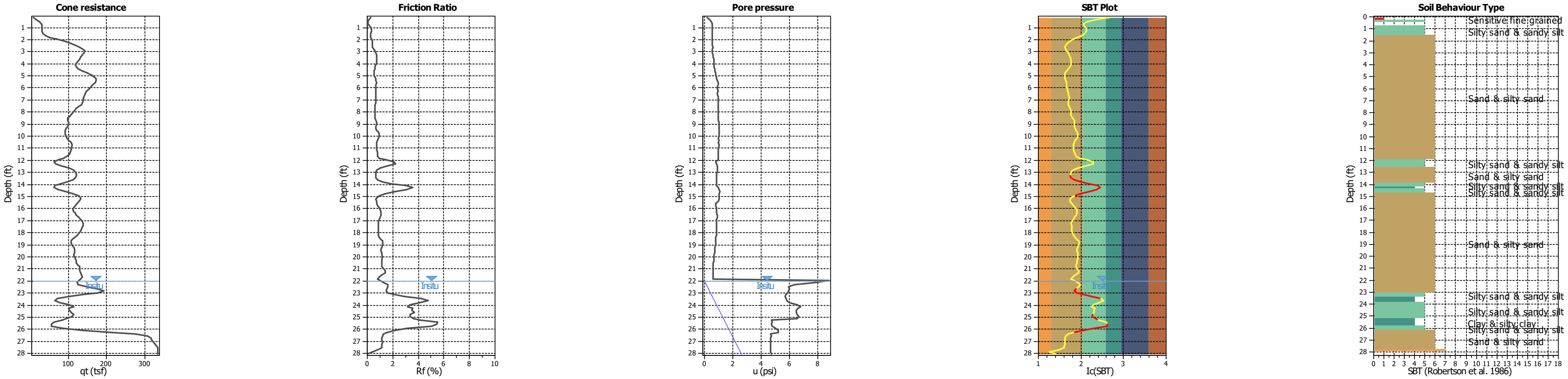






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



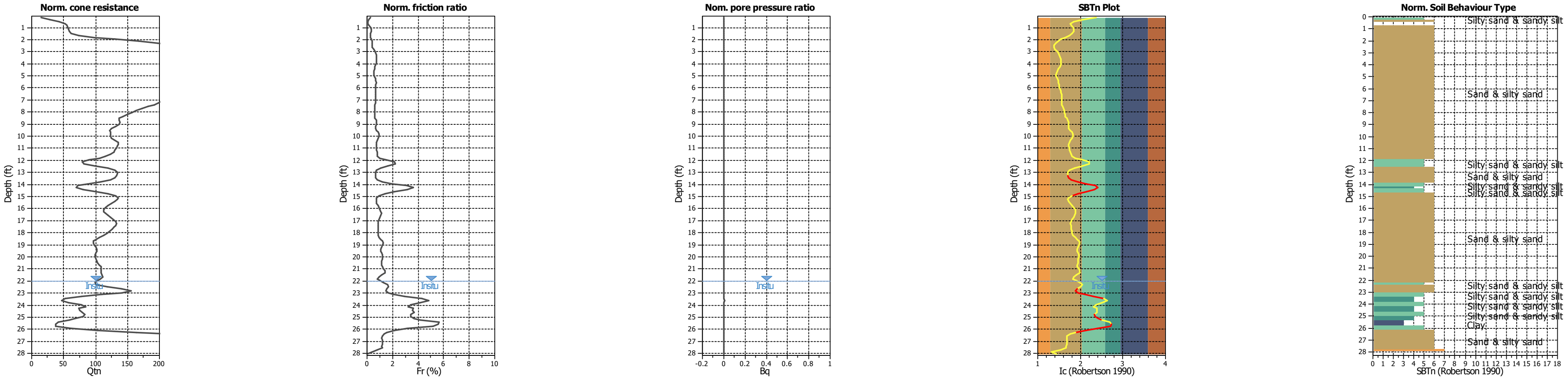
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



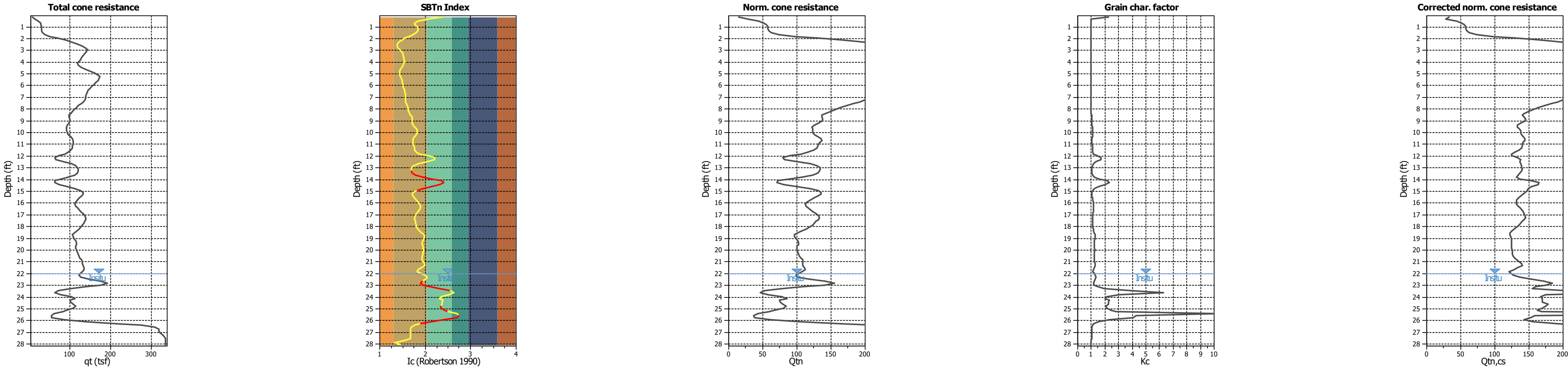
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

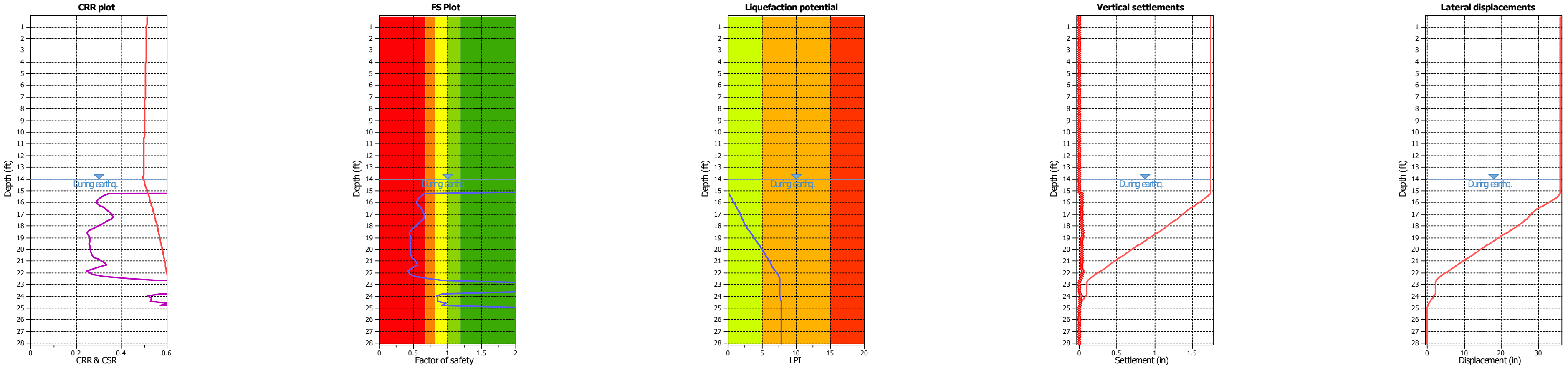
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

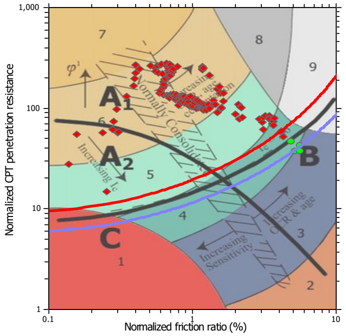
F.S. color scheme

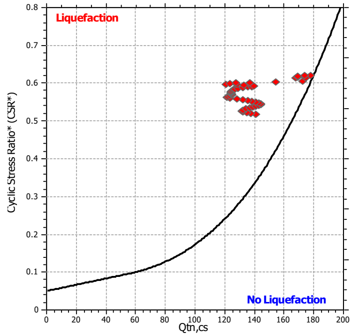
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

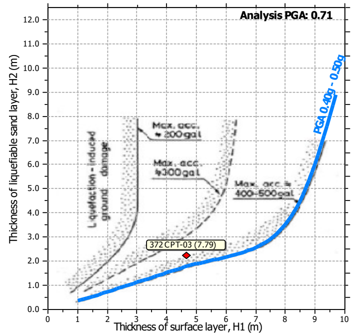
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



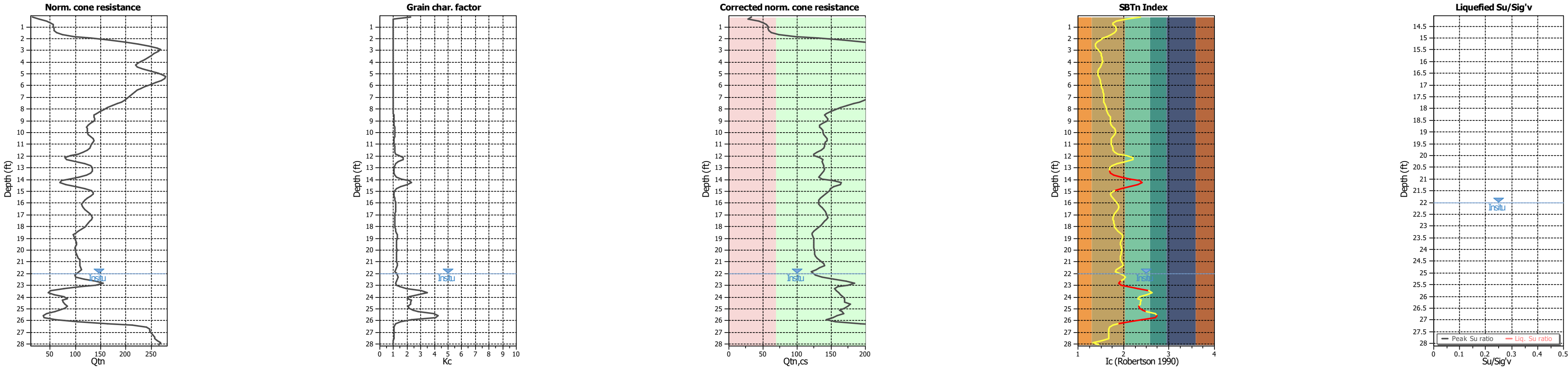




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

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San Jacinto, California

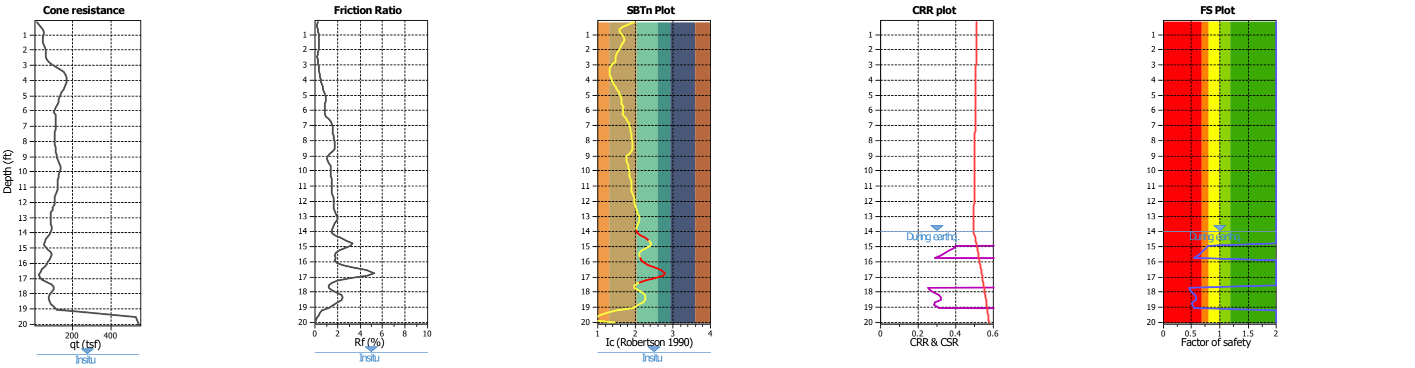
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

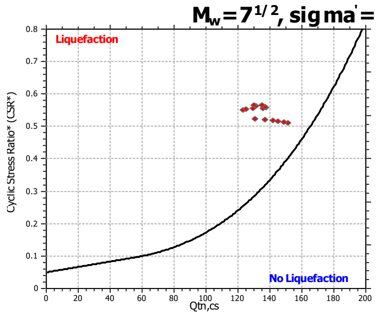
CPT file : 372CPT-04

Input parameters and analysis data

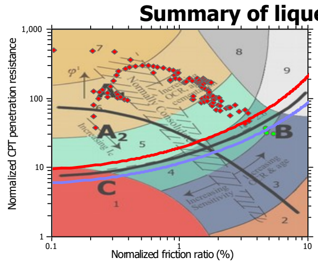
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	22.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



M_w=7$^{1/2}$, sigma'=1 atm base curve

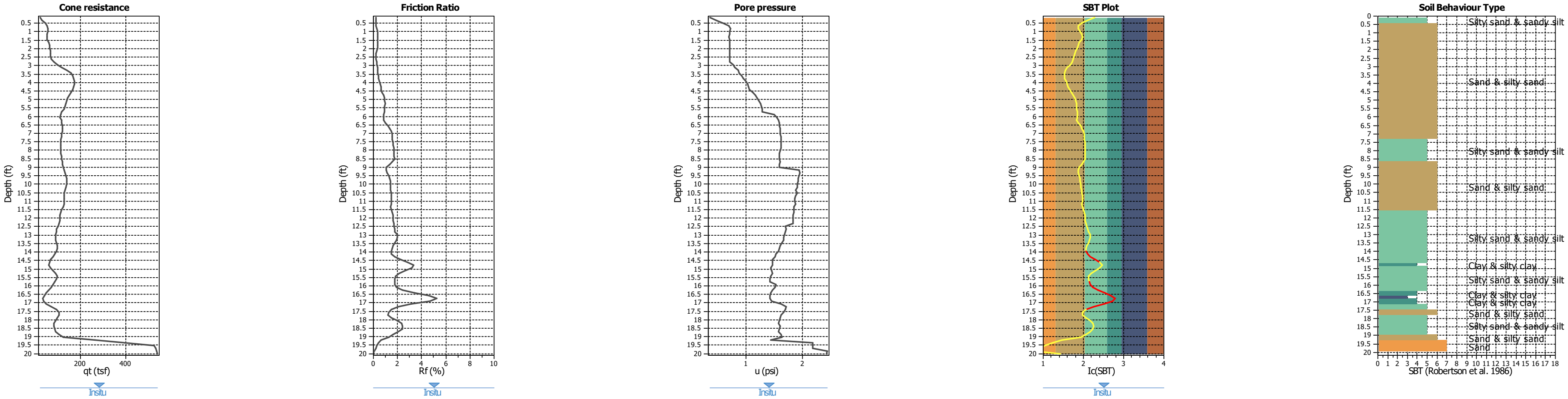


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



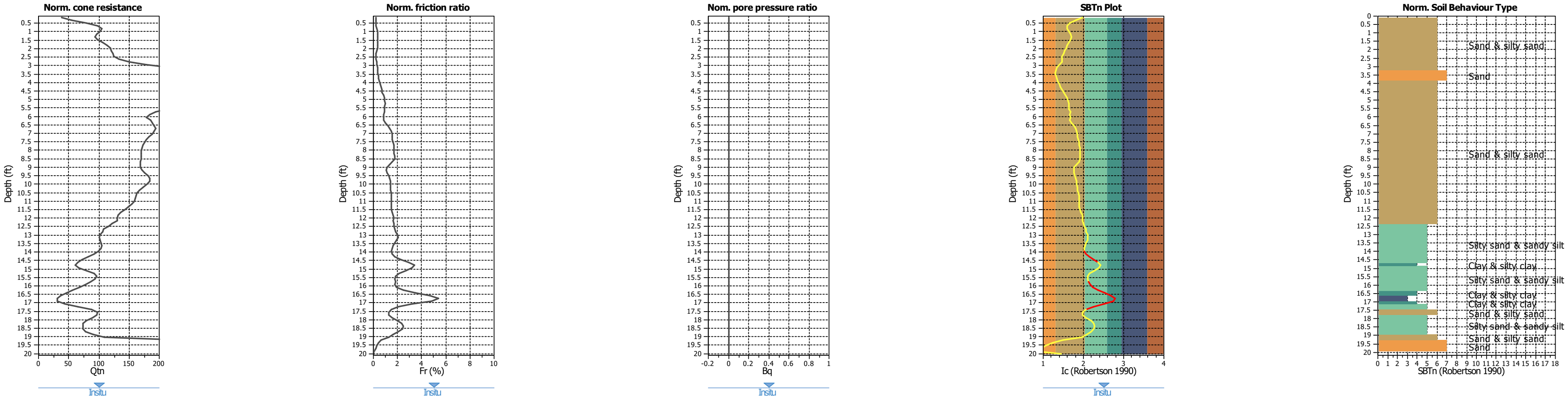
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



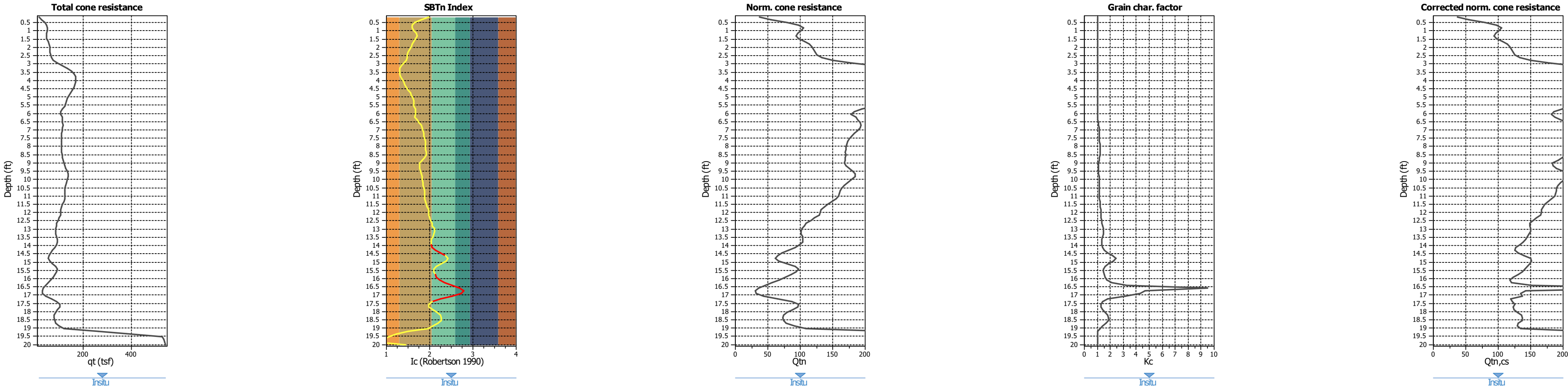
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

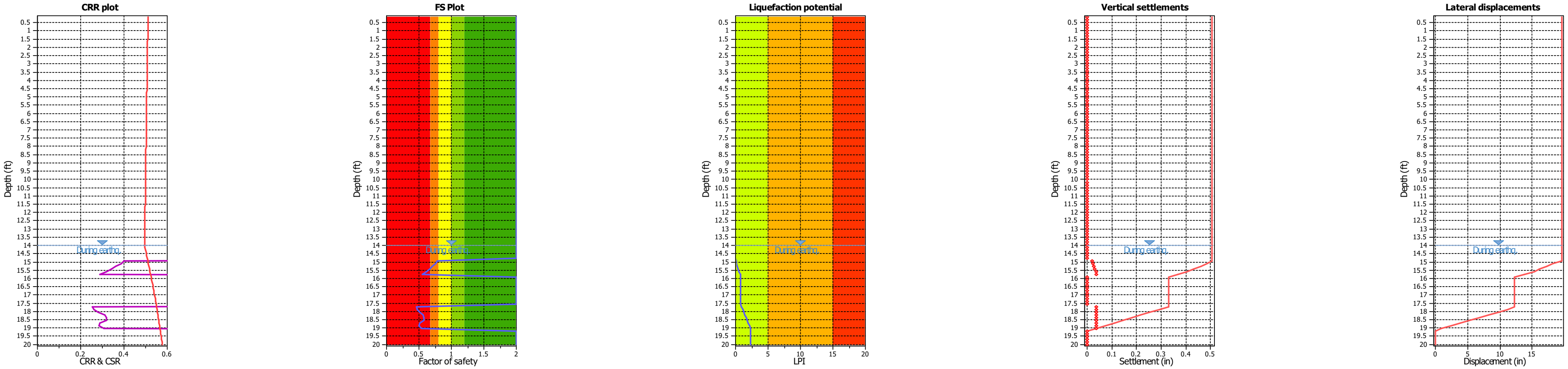
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

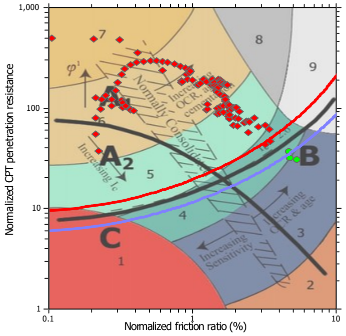
F.S. color scheme

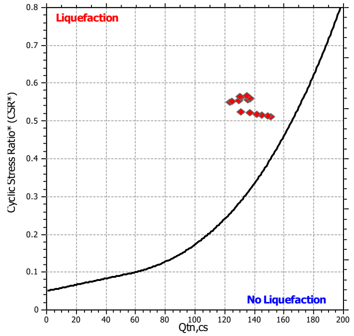
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

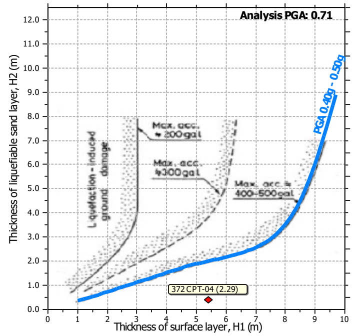
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



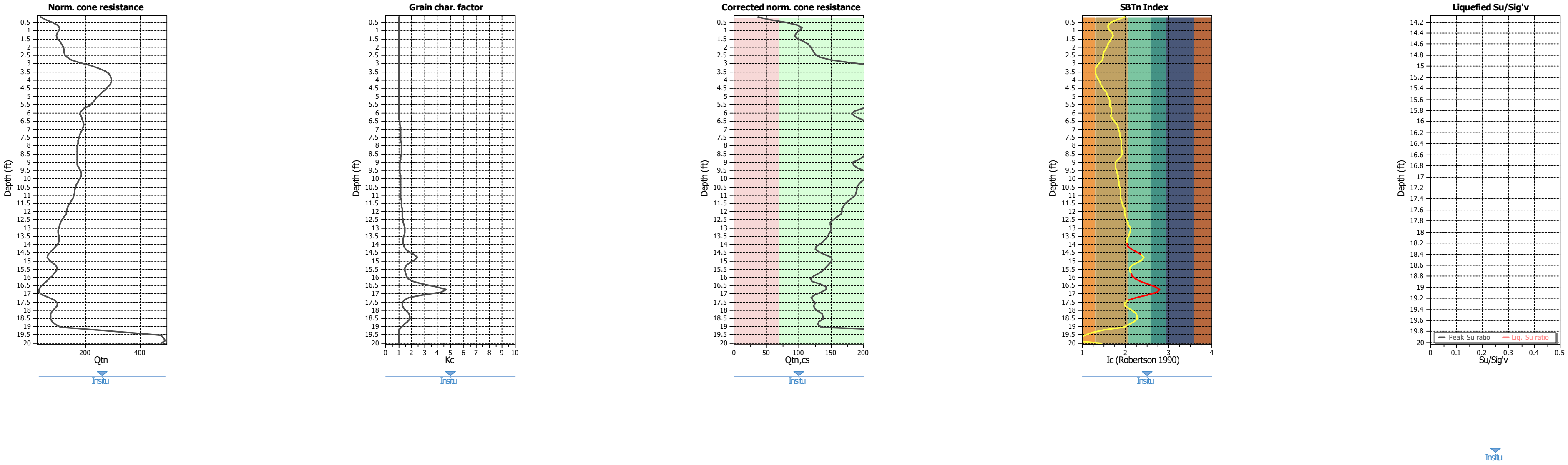




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.00 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
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San Jacinto, California

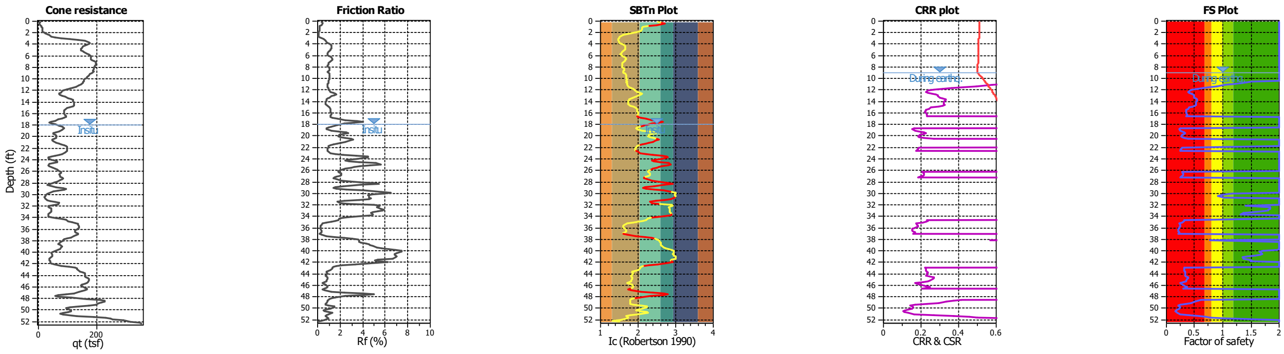
LIQUEFACTION ANALYSIS REPORT

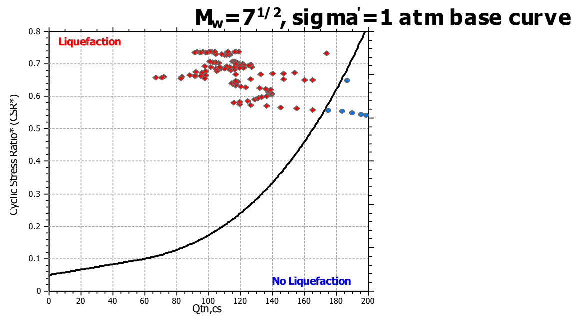
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

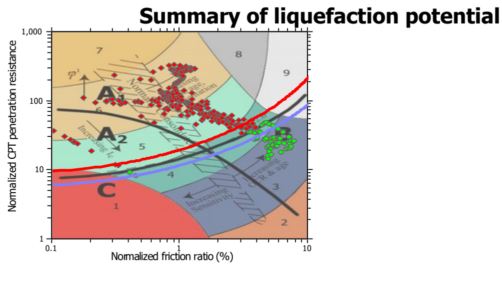
CPT file : 372CPT-05

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	18.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	9.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

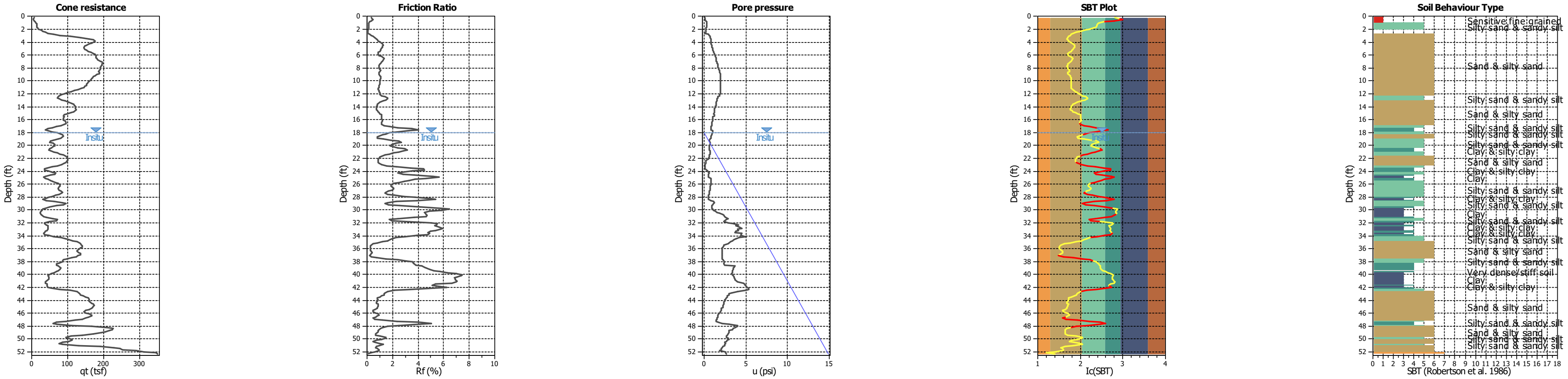






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



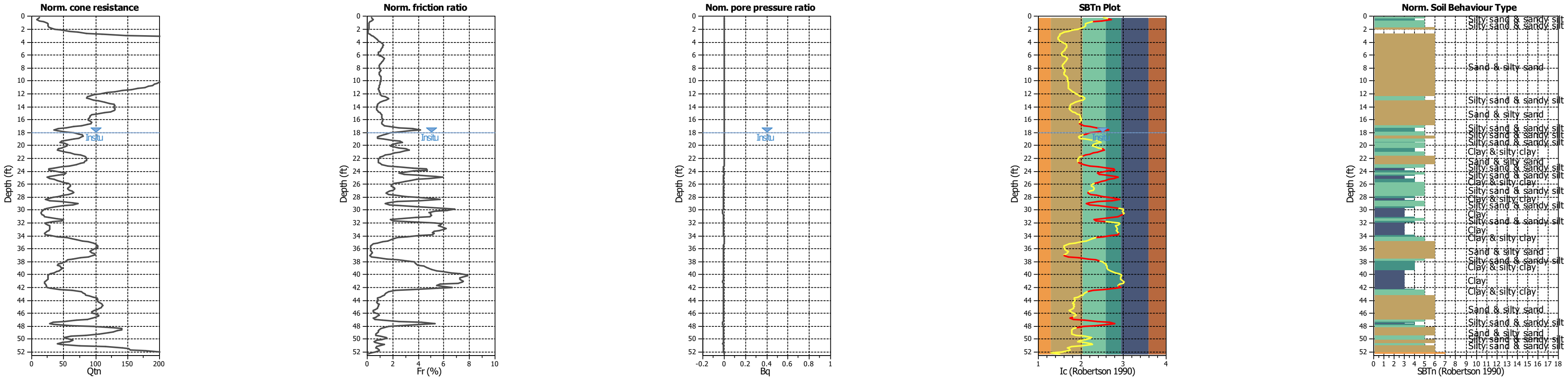
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



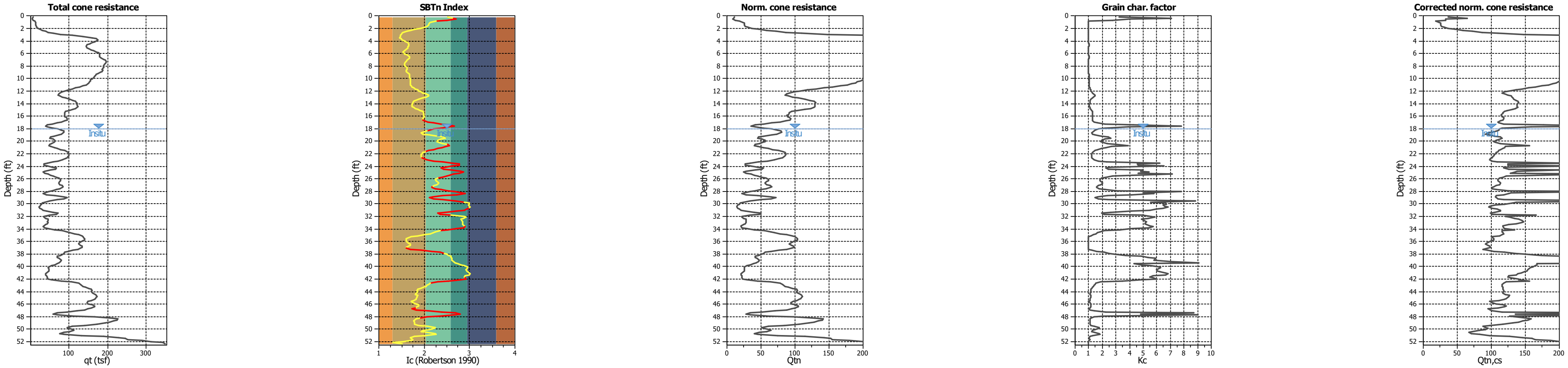
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

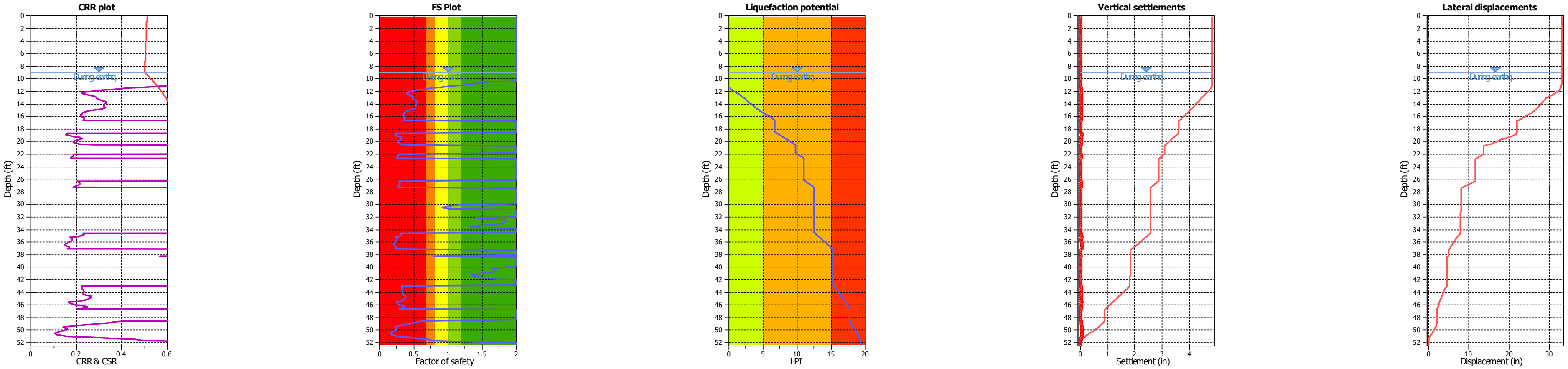
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

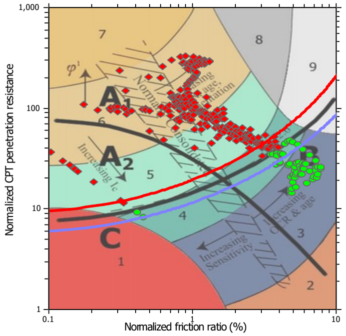
F.S. color scheme

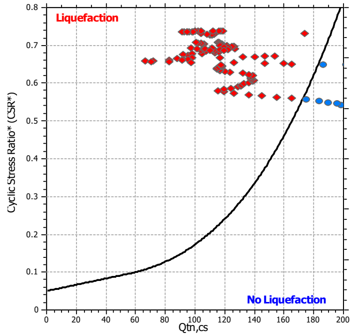
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

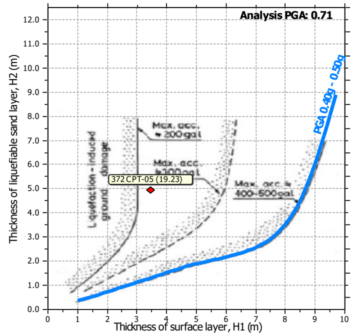
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



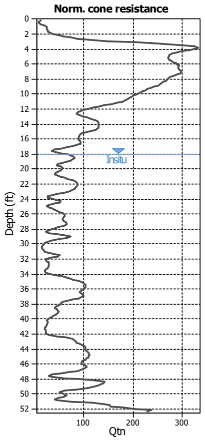


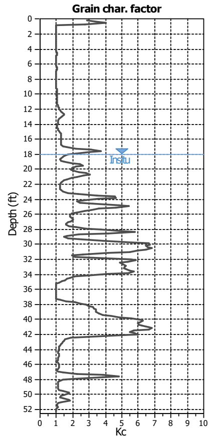


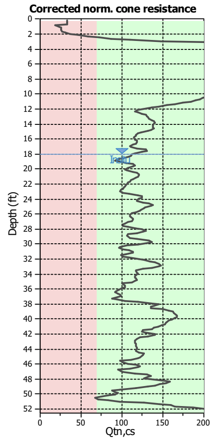
Input parameters and analysis data

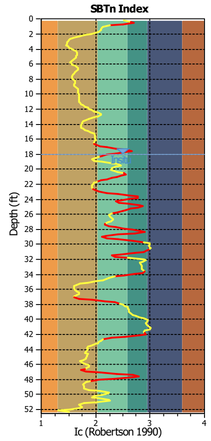
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

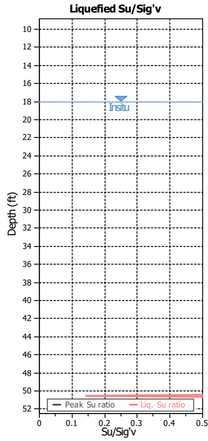
Check for strength loss plots (Robertson (2010))











Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	9.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

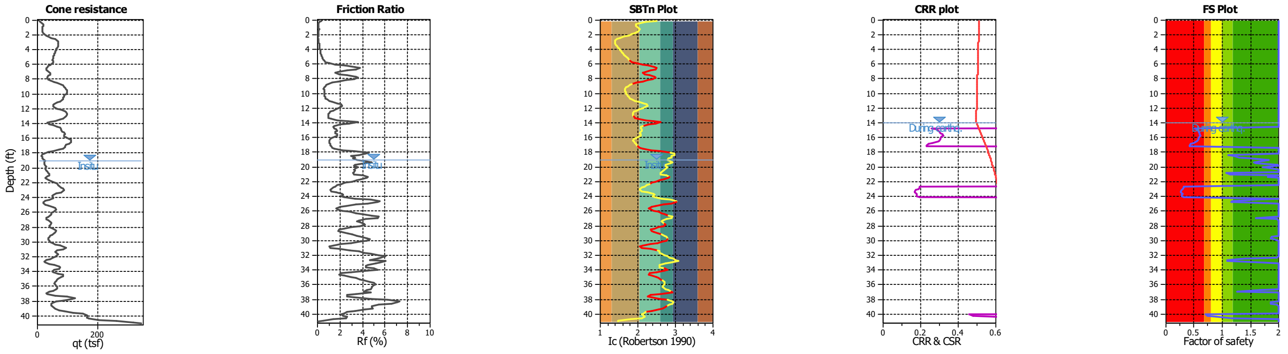
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

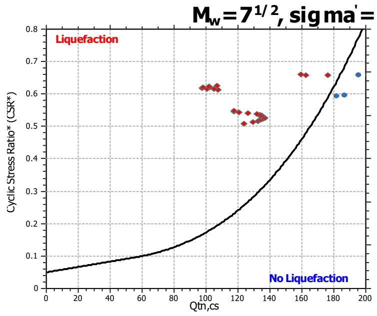
CPT file : 372CPT-06

Input parameters and analysis data

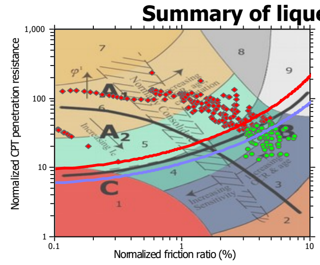
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	19.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



$M_w=7^{1/2}$, sigma'=1 atm base curve

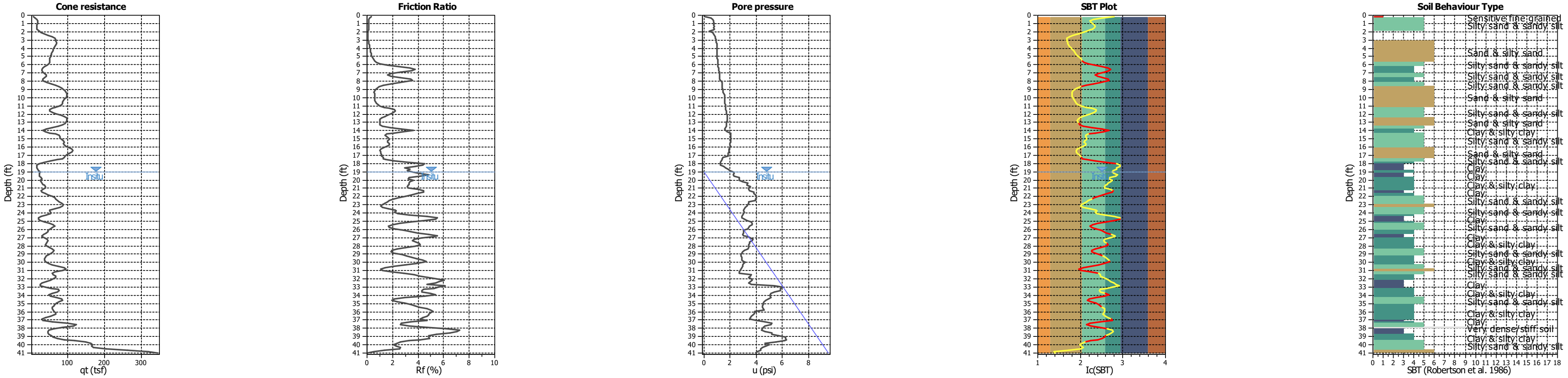


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



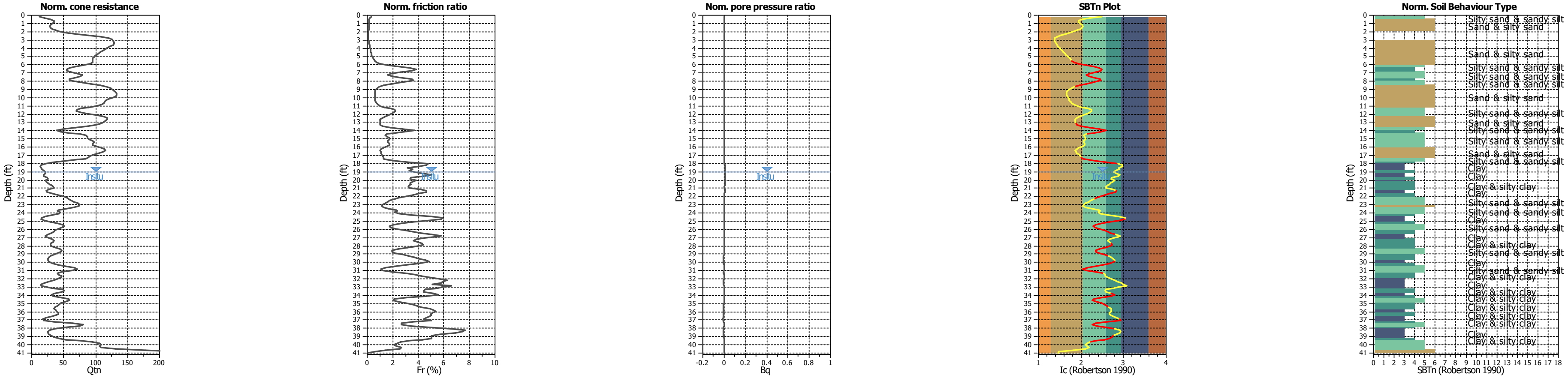
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A		

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



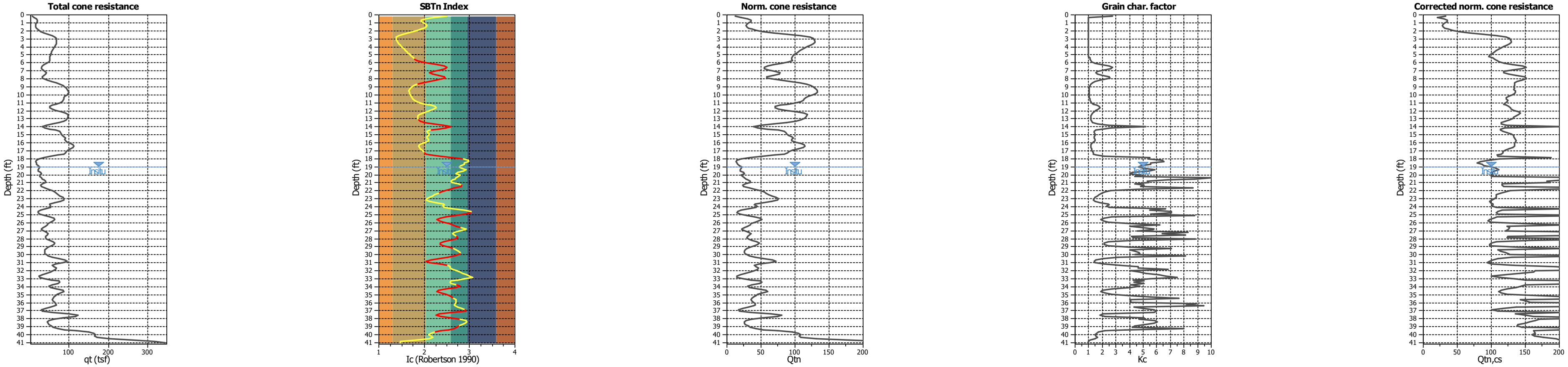
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

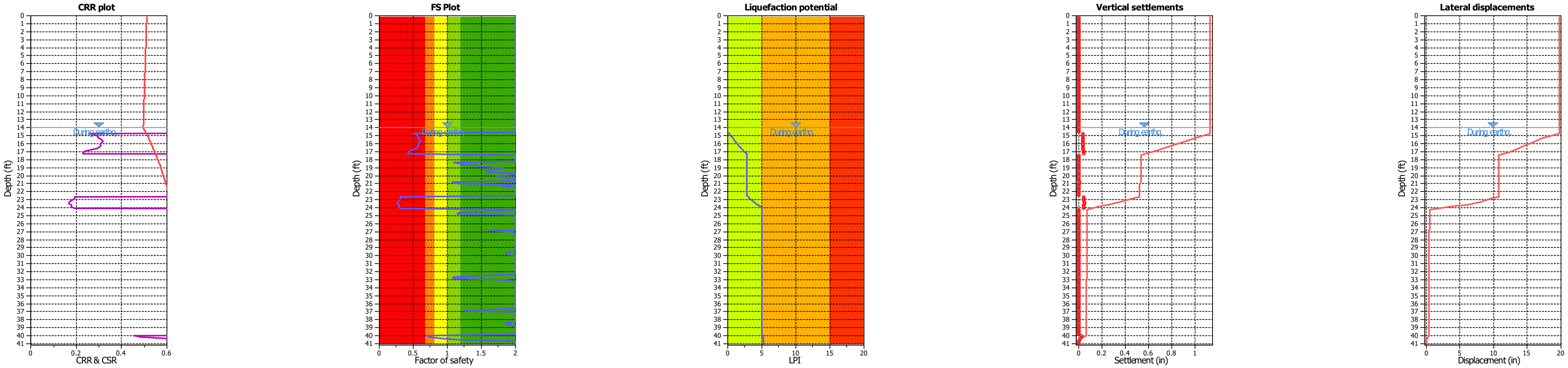
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A

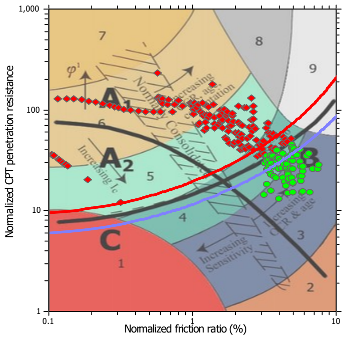
F.S. color scheme

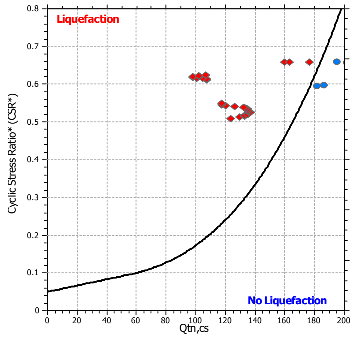
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

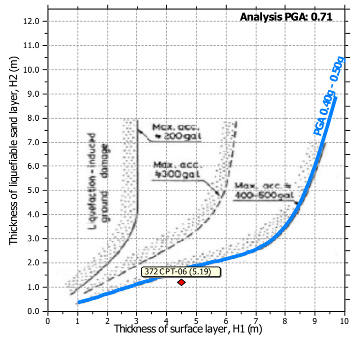
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



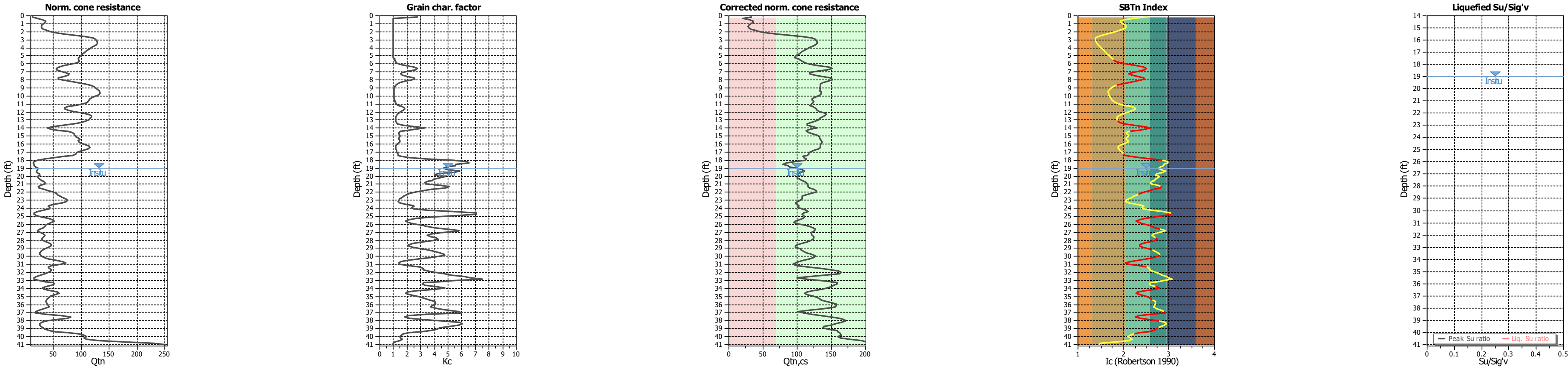




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	19.00 ft	Fill height:	N/A	Limit depth:	N/A

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Geotechnical Engineers
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San Jacinto, California

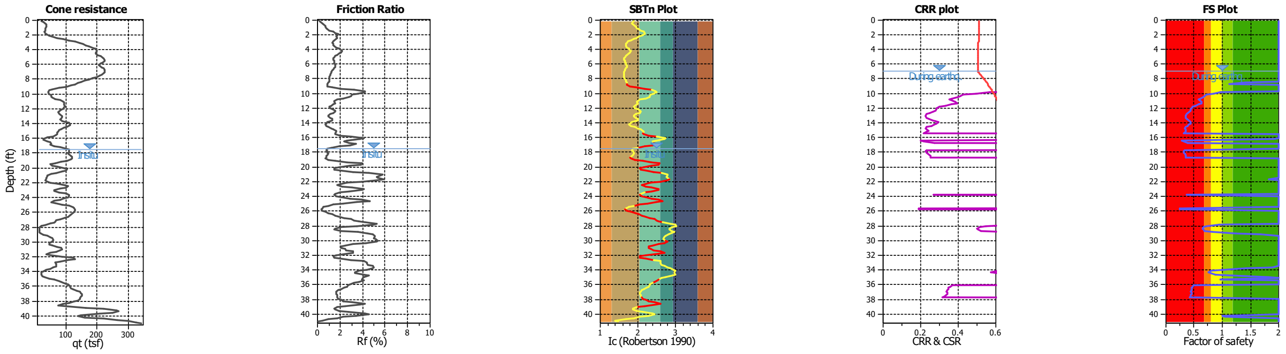
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

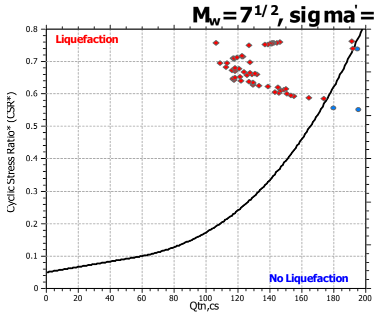
CPT file : 372CPT-07

Input parameters and analysis data

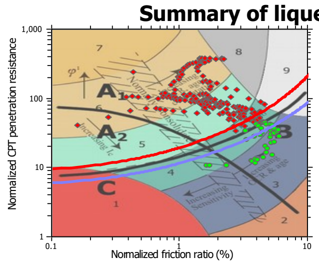
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	17.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	7.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



M_w=7$^{1/2}$, sigma'=1 atm base curve

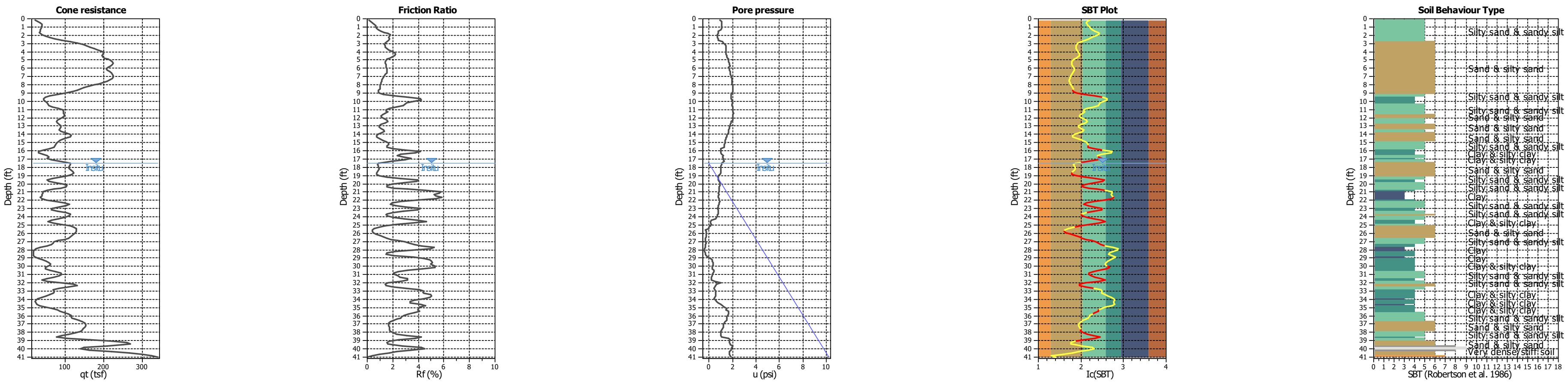


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



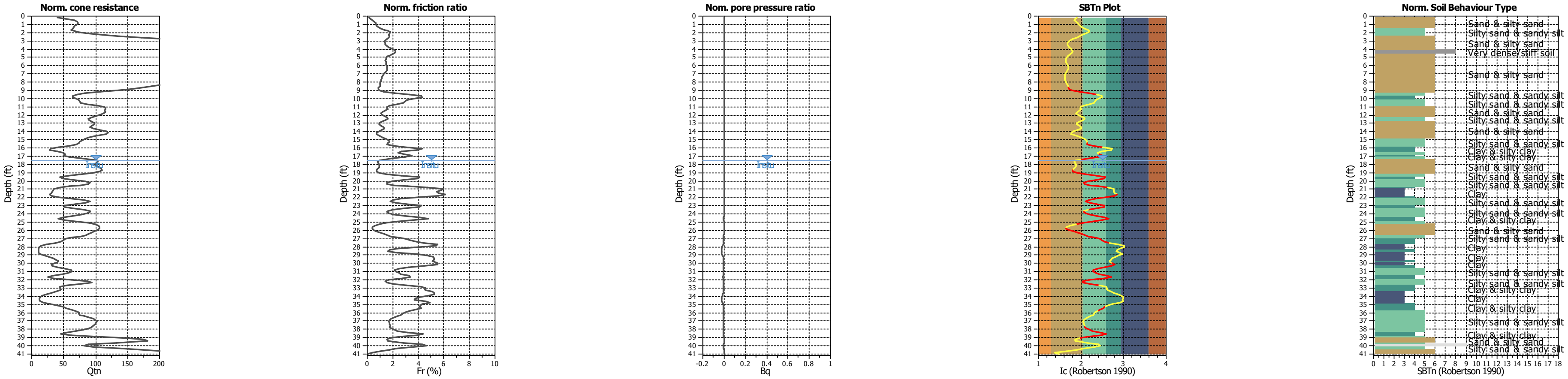
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



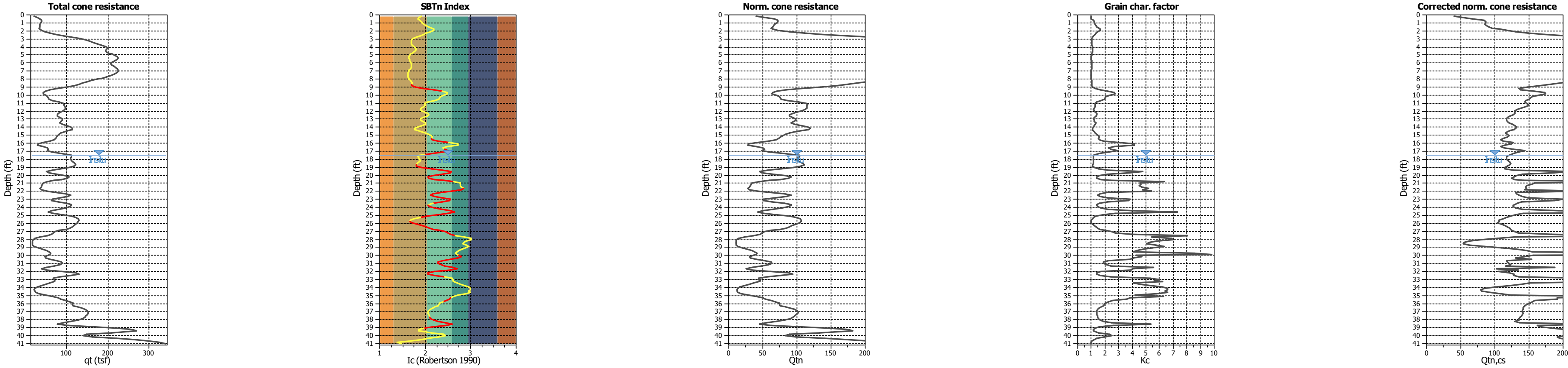
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

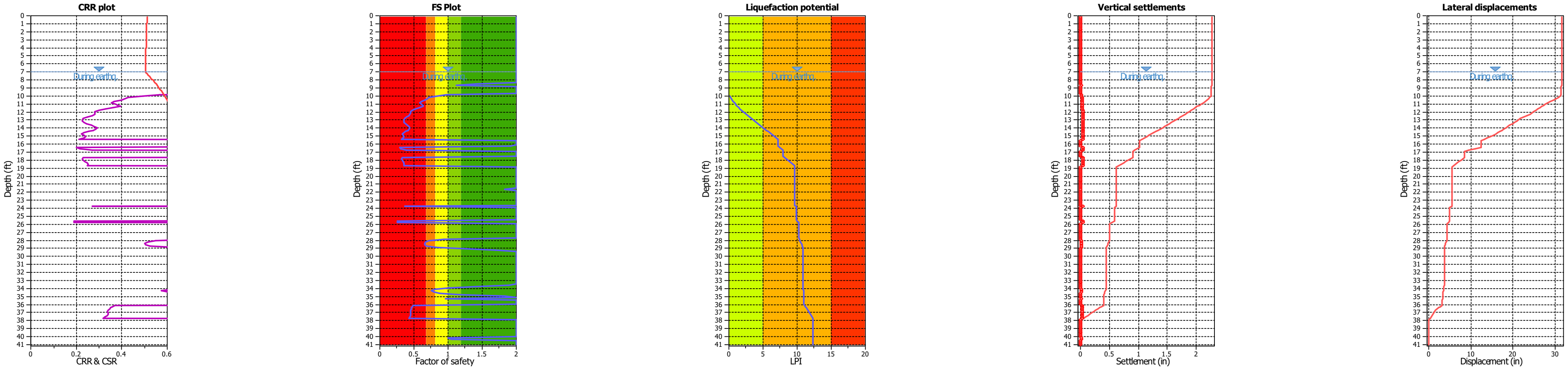
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

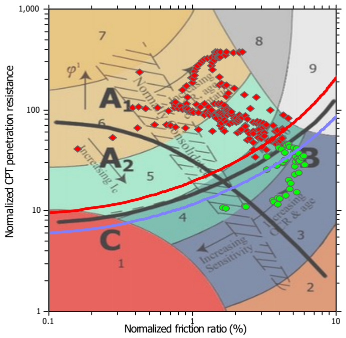
F.S. color scheme

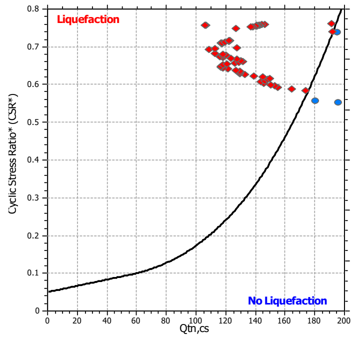
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

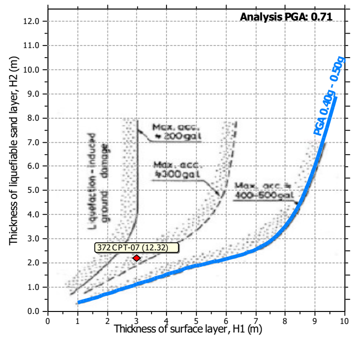
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



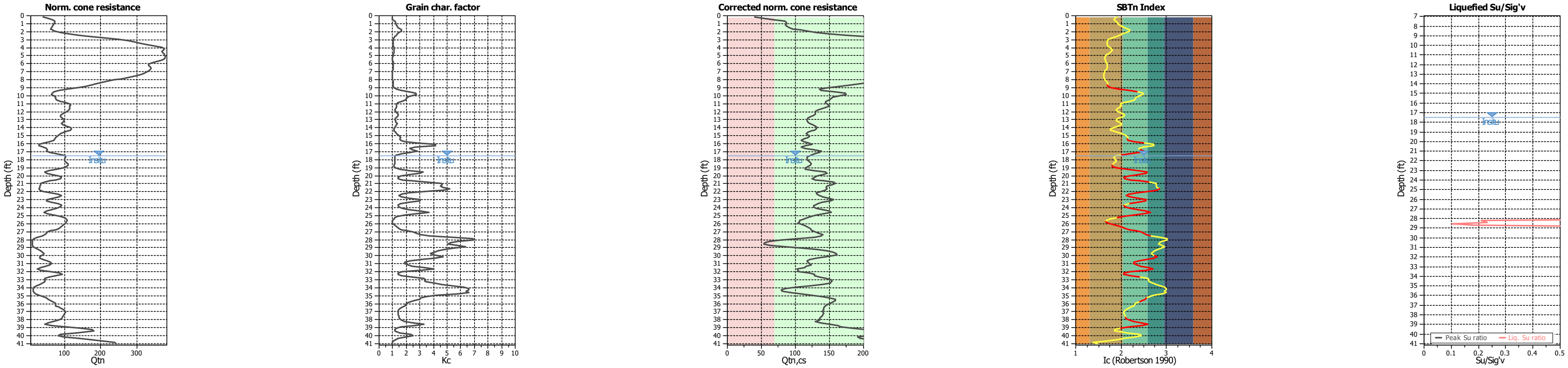




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	7.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	17.50 ft	Fill height:	N/A	Limit depth:	N/A

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Geotechnical Engineers
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San Jacinto, California

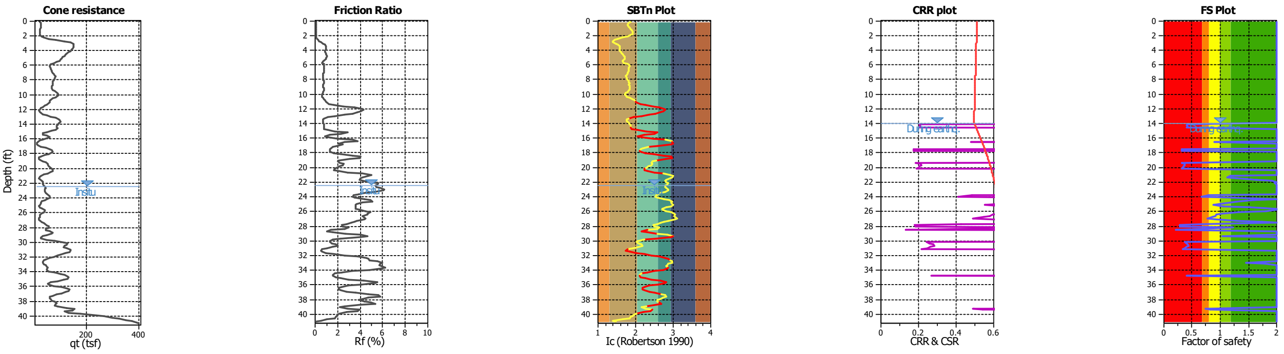
LIQUEFACTION ANALYSIS REPORT

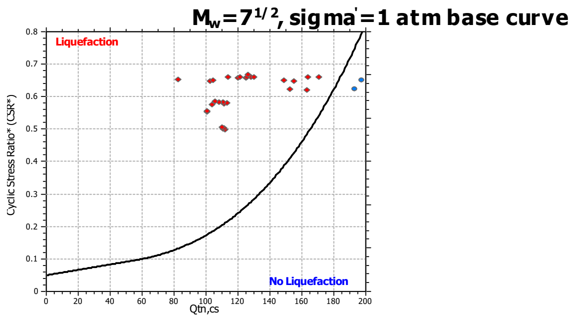
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

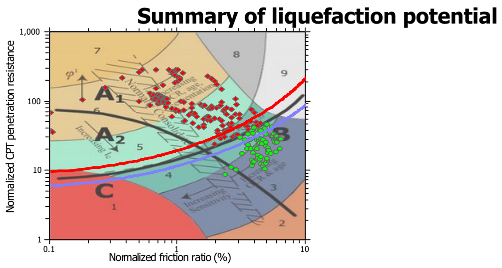
CPT file : 372CPT-08

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	22.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

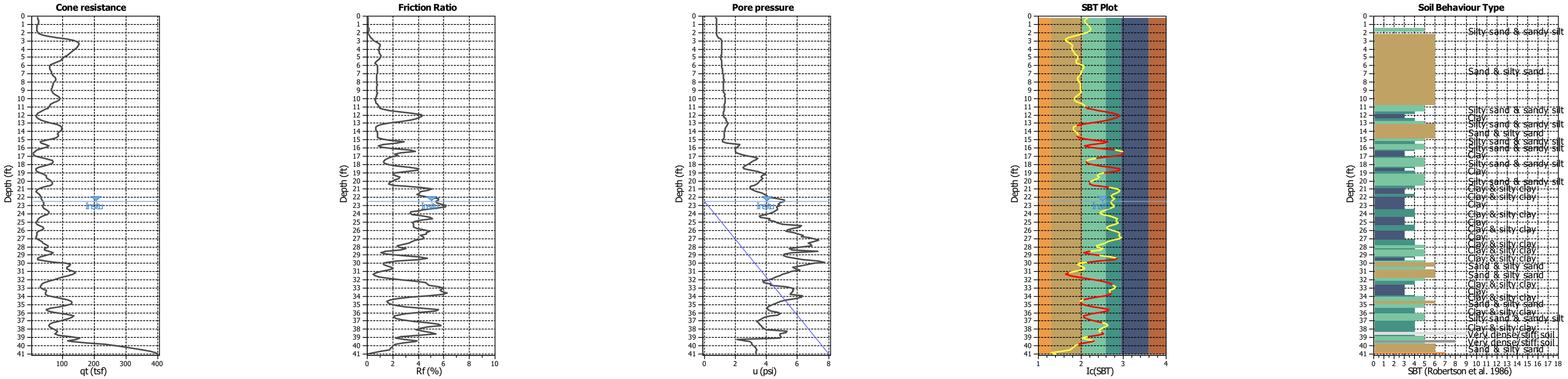






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



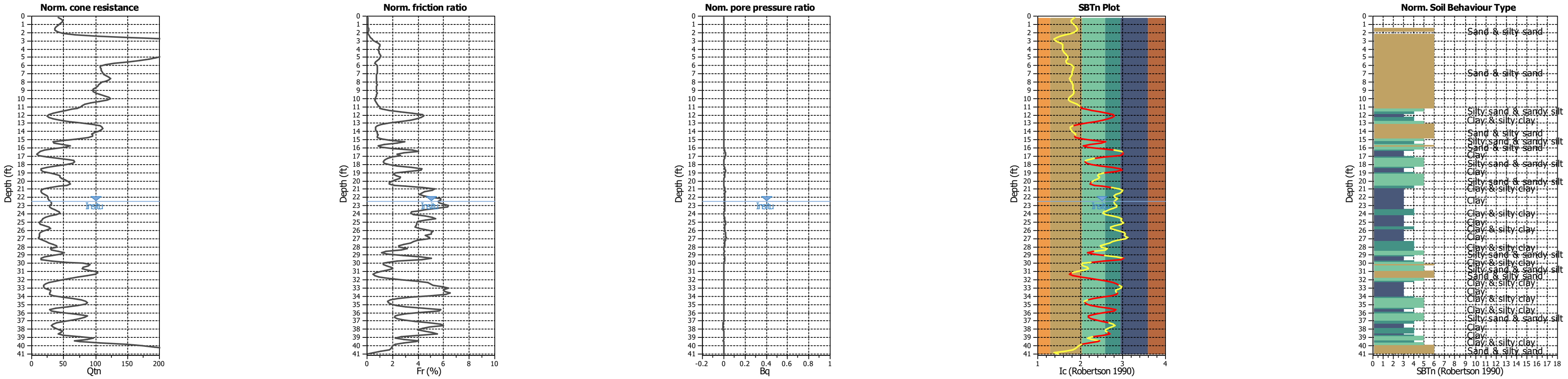
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A		

SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

CPT basic interpretation plots (normalized)



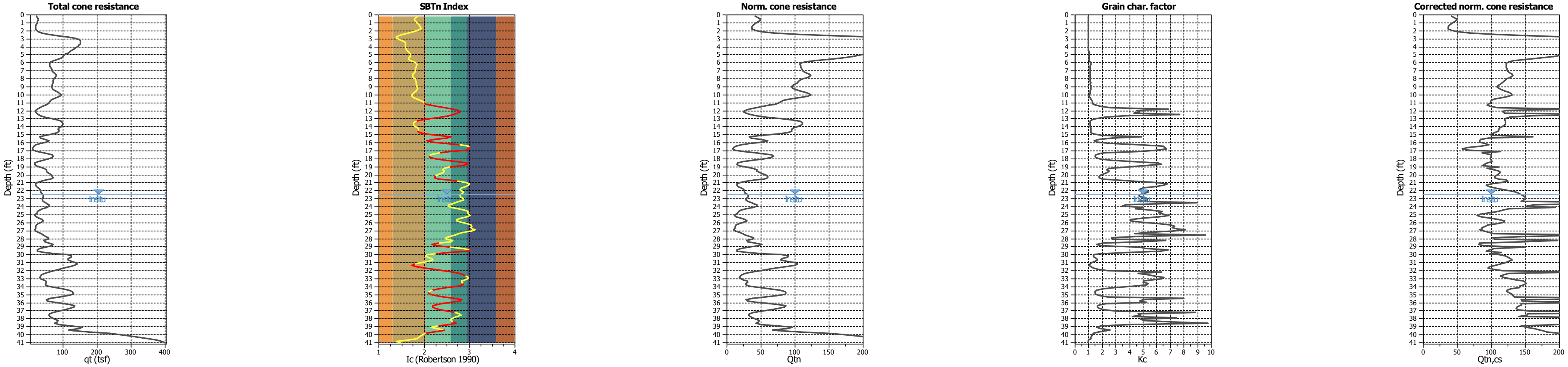
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

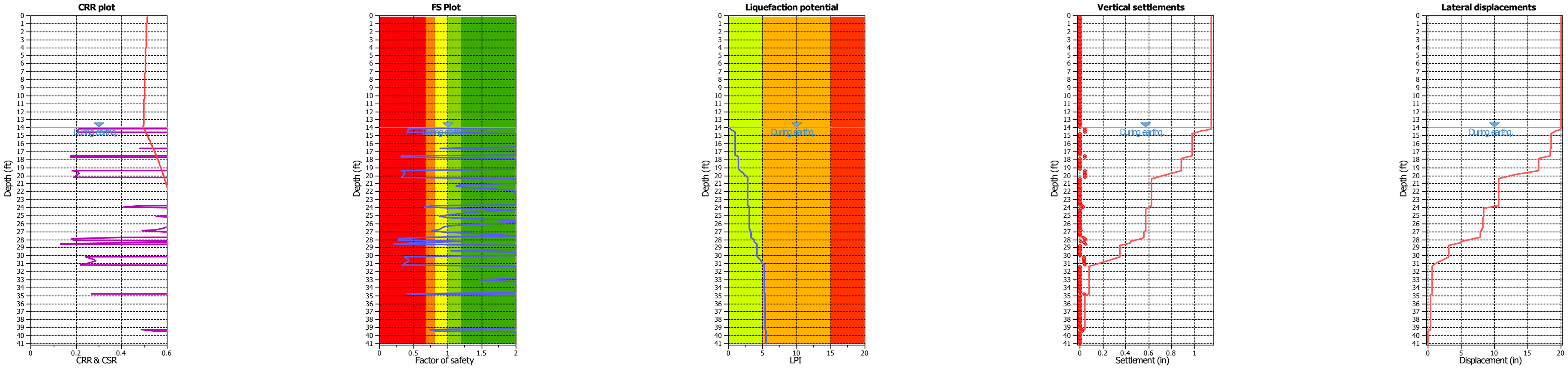
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
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Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

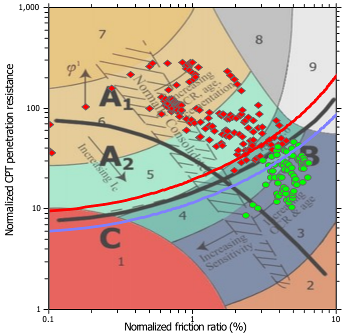
F.S. color scheme

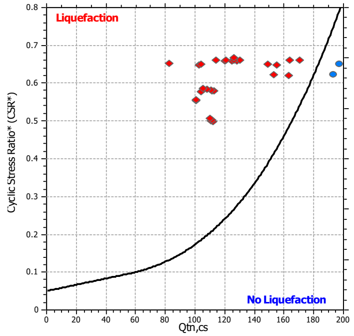
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

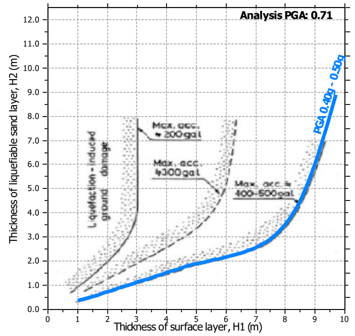
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



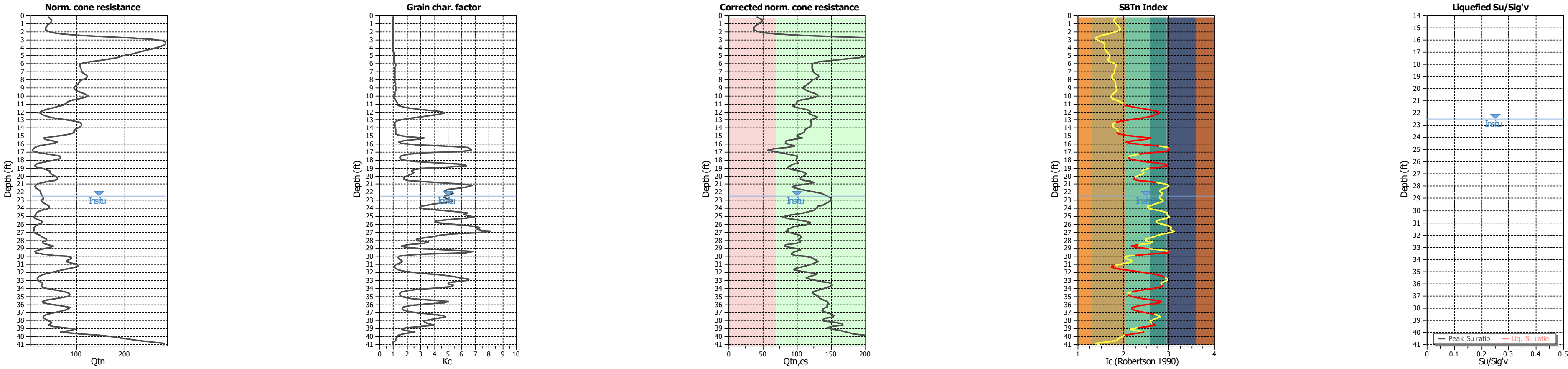




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

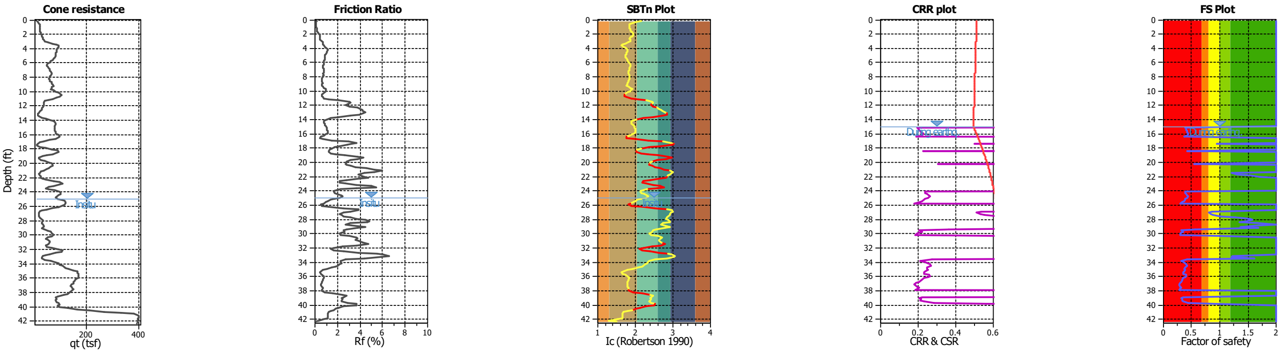
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

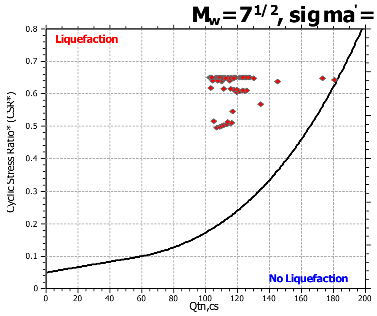
CPT file : 372CPT-09

Input parameters and analysis data

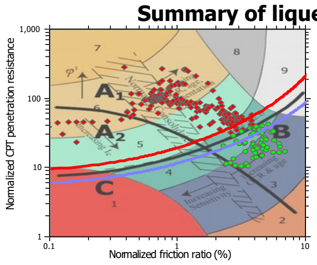
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	25.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



M_w=7$^{1/2}$, sigma'=1 atm base curve

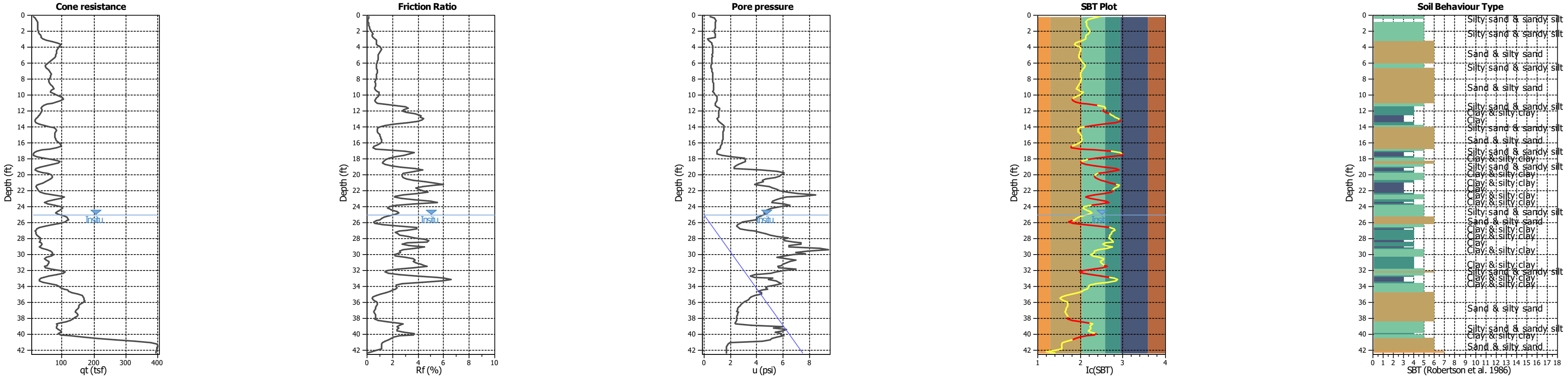


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



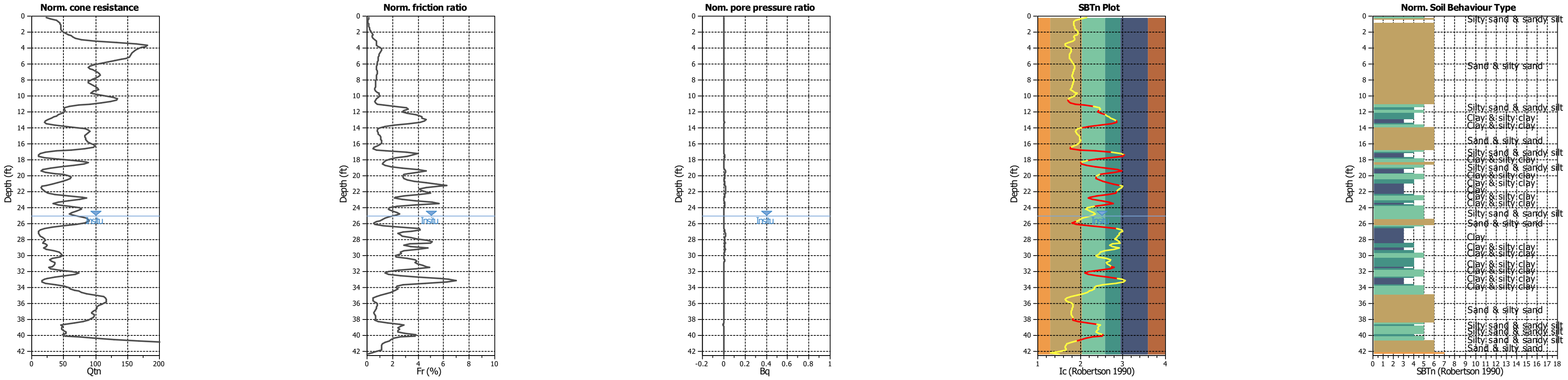
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

CPT basic interpretation plots (normalized)



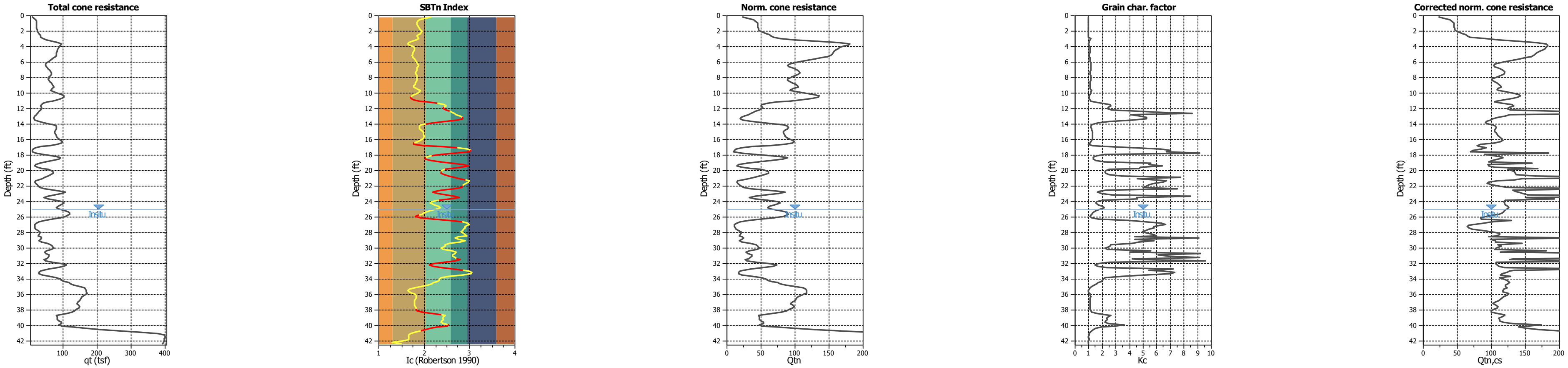
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A		

SBTn legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

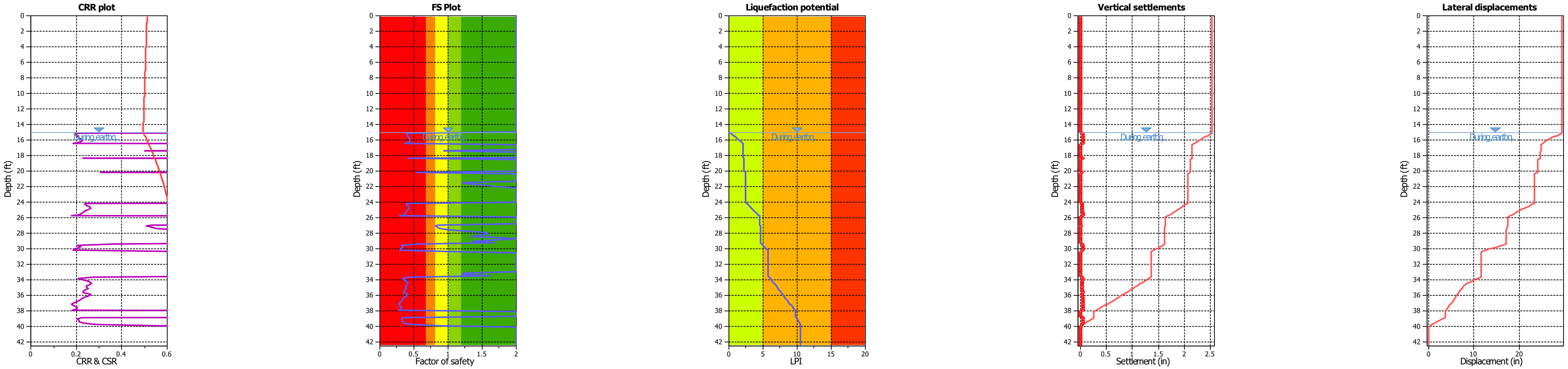
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

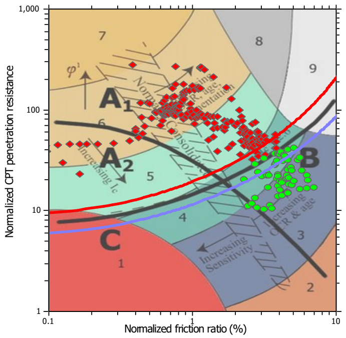
F.S. color scheme

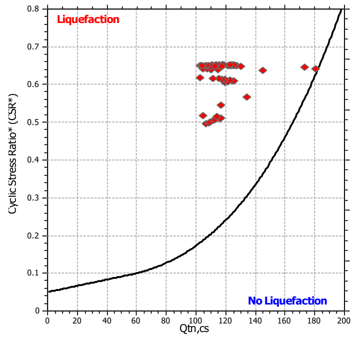
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

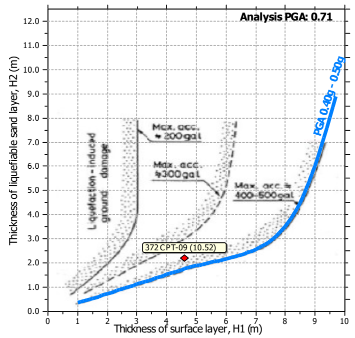
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



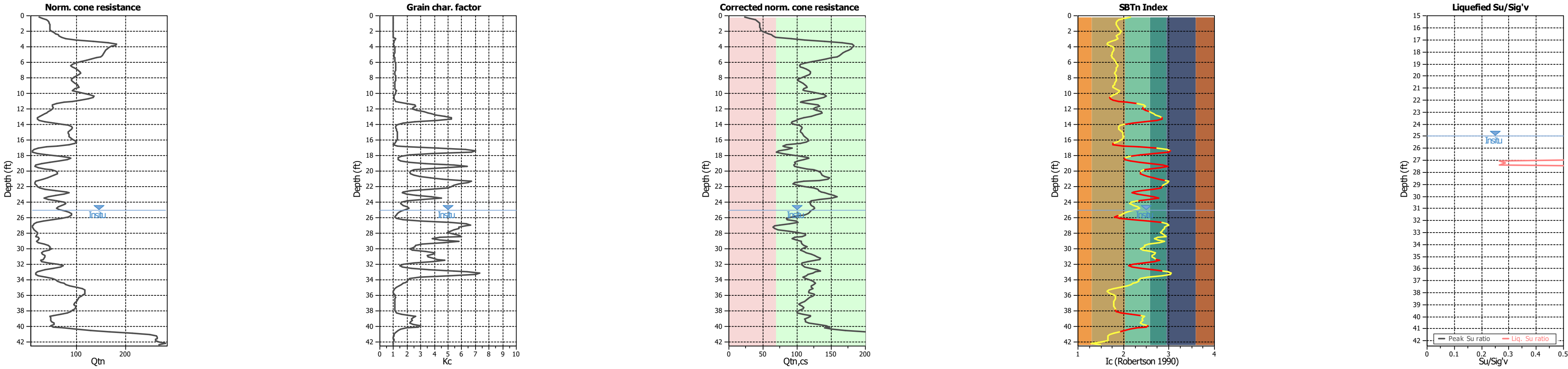




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

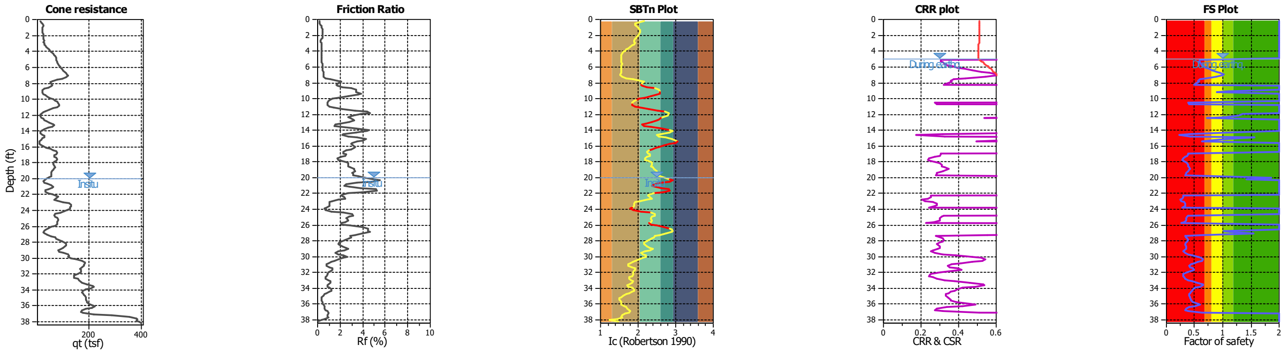
LIQUEFACTION ANALYSIS REPORT

Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

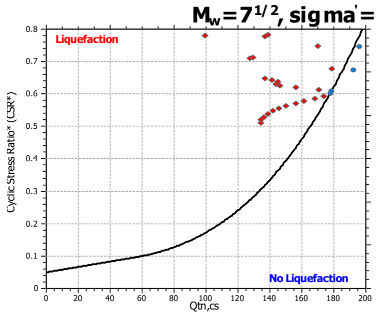
CPT file : 372CPT-10

Input parameters and analysis data

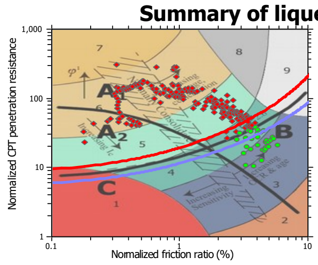
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	20.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		



M_w=7$^{1/2}$, sigma'=1 atm base curve

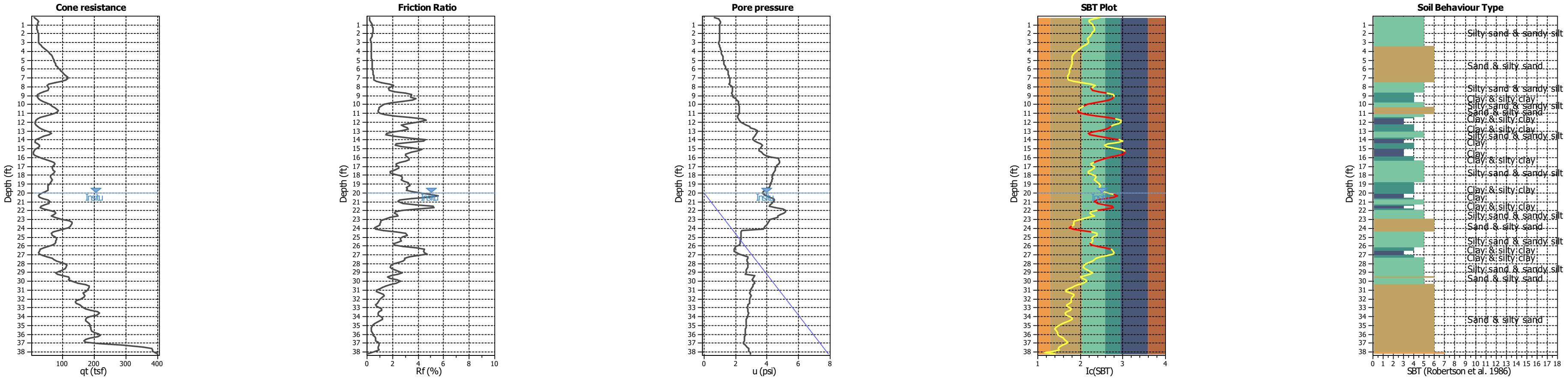


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



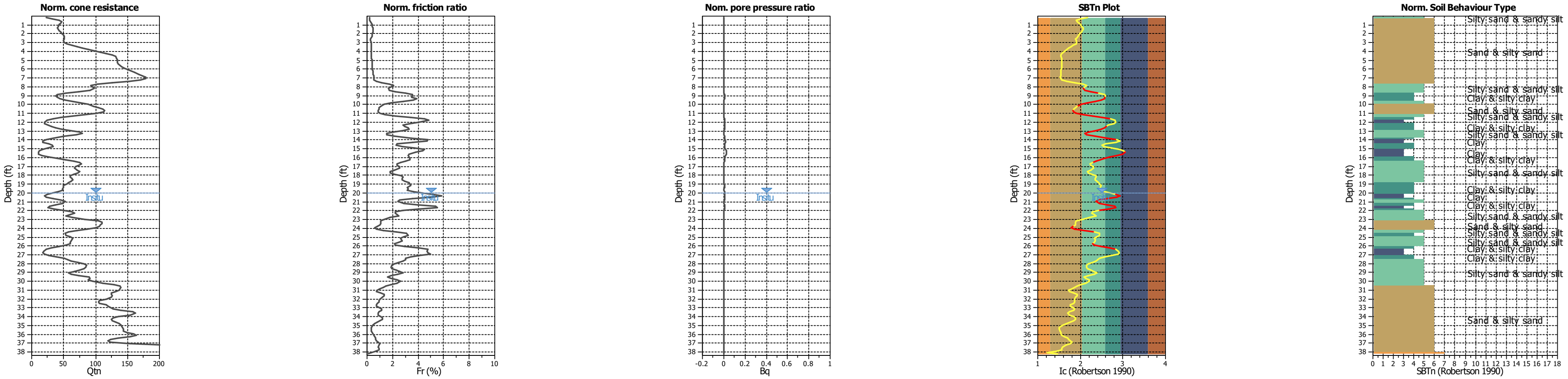
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



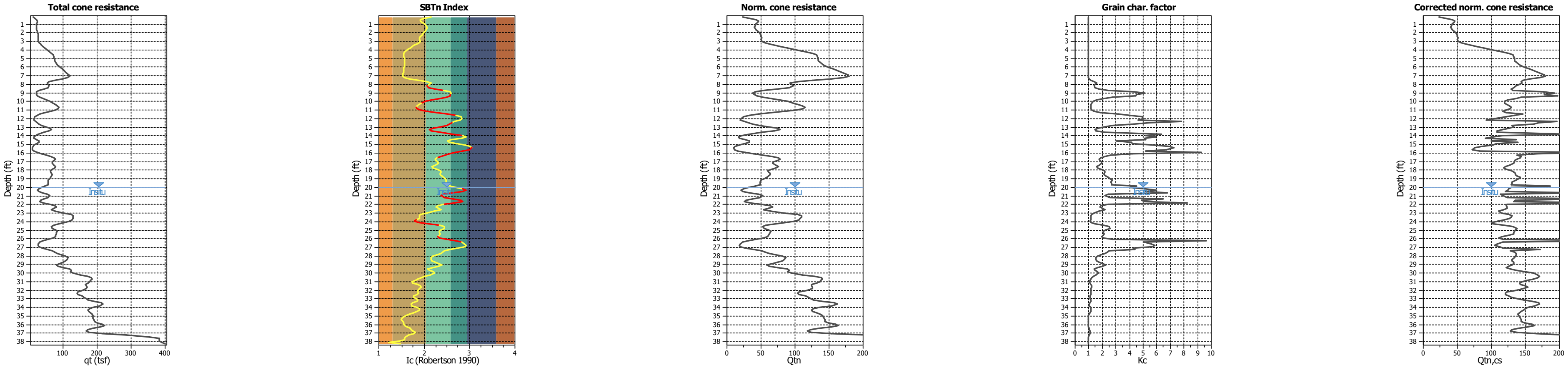
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

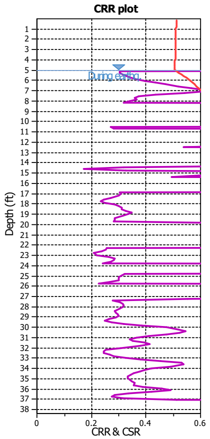
Liquefaction analysis overall plots (intermediate results)

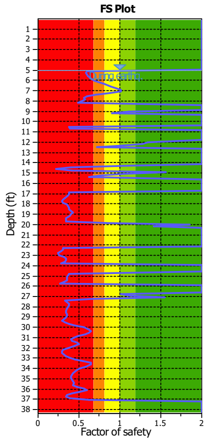


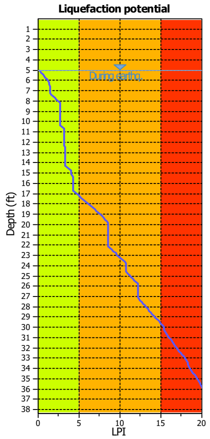
Input parameters and analysis data

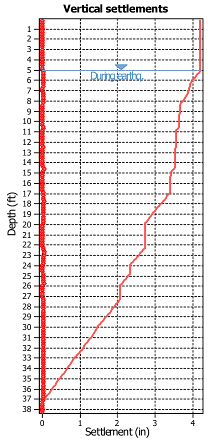
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

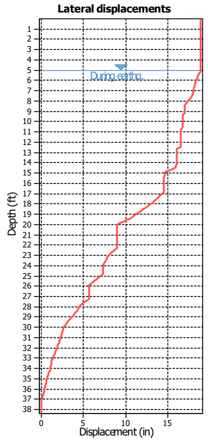
Liquefaction analysis overall plots











Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

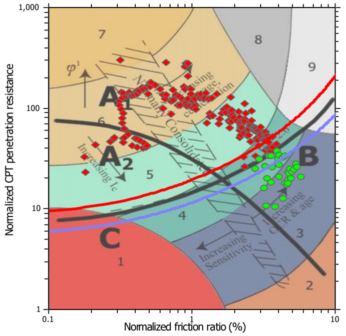
F.S. color scheme

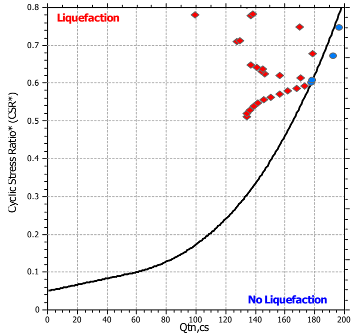
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

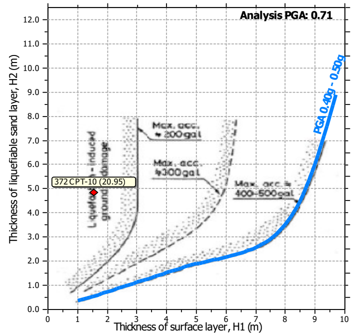
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



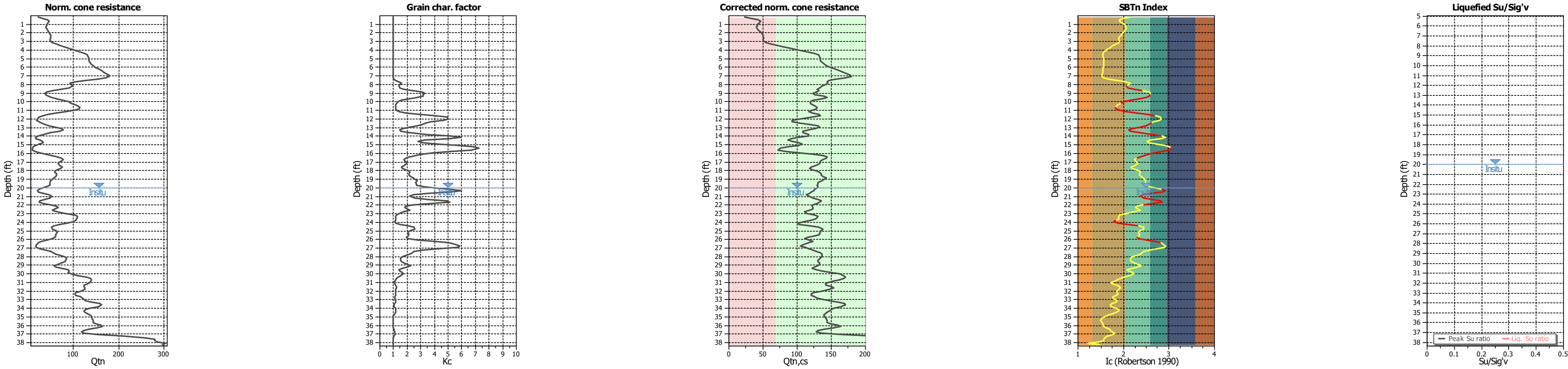




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	20.00 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

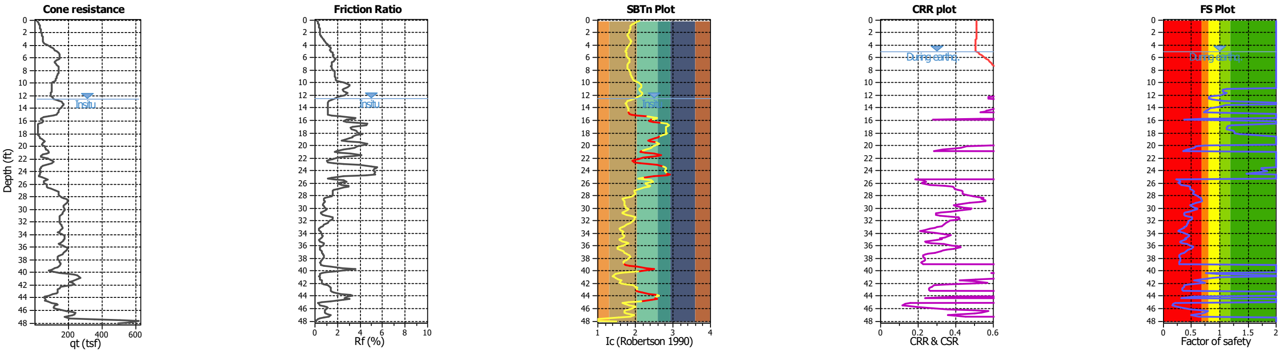
LIQUEFACTION ANALYSIS REPORT

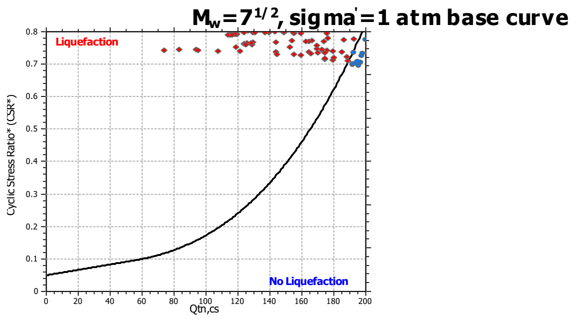
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

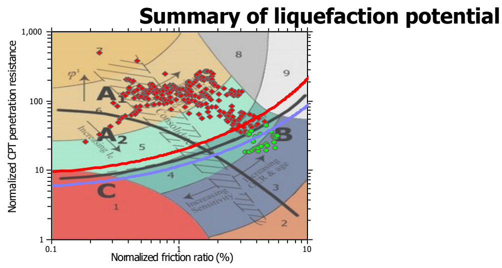
CPT file : 372CPT-11

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	12.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	5.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

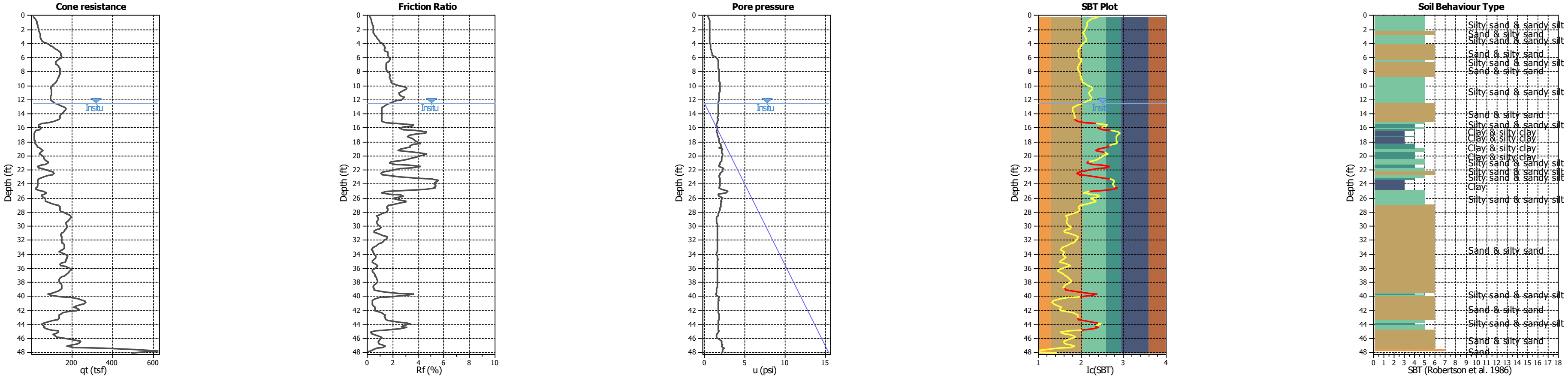






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



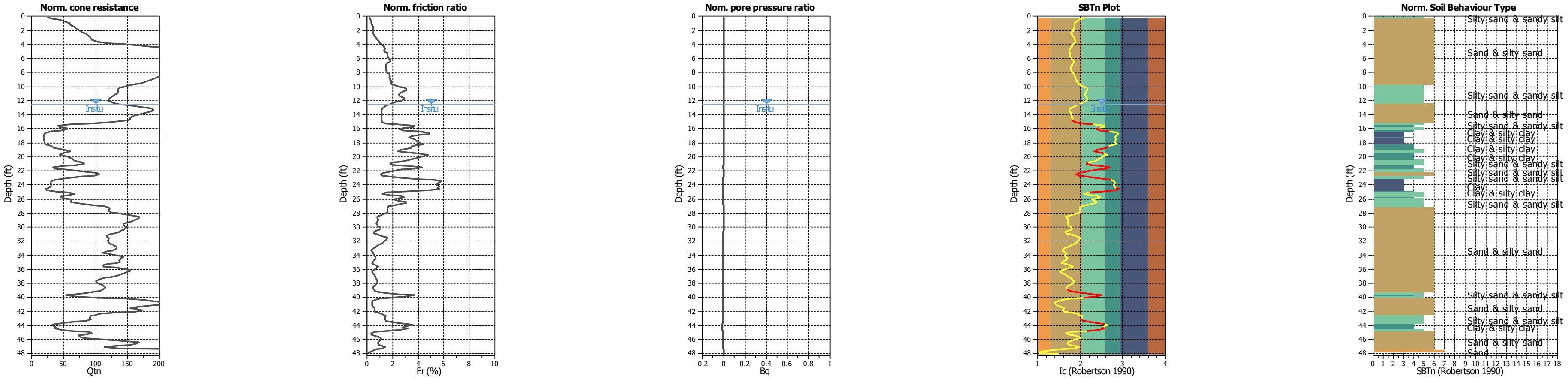
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A		

SBT legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

CPT basic interpretation plots (normalized)



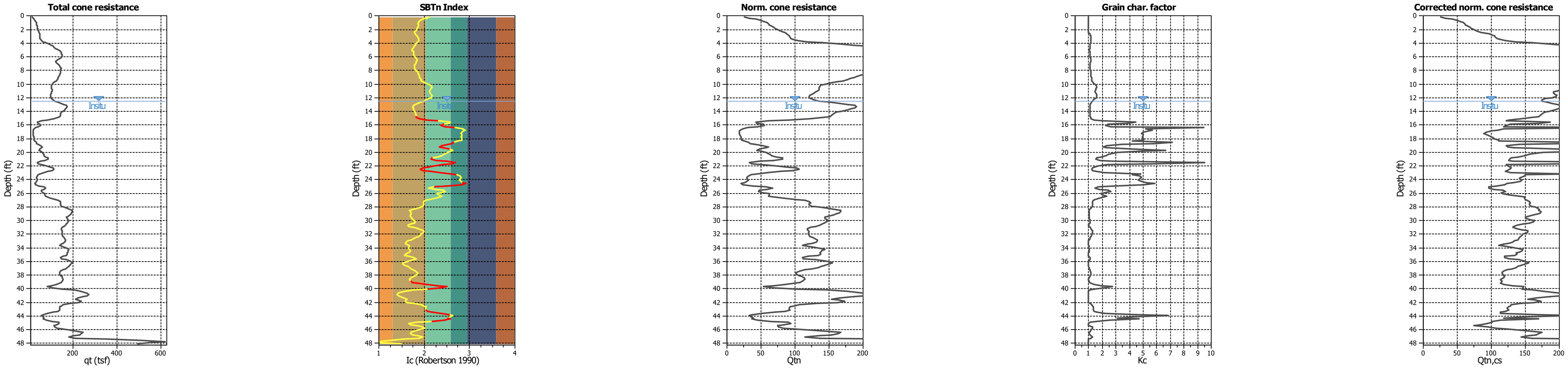
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

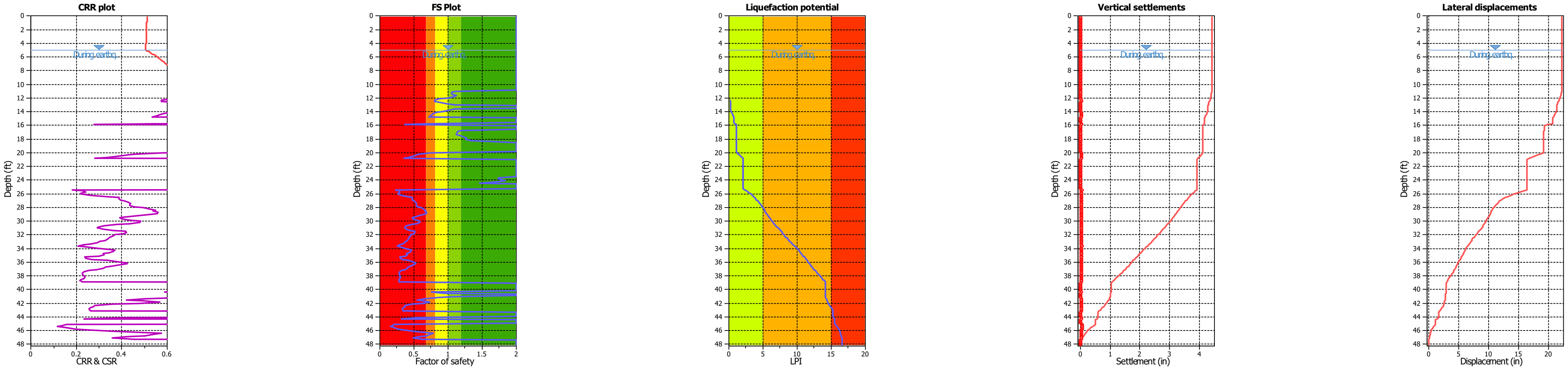
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A

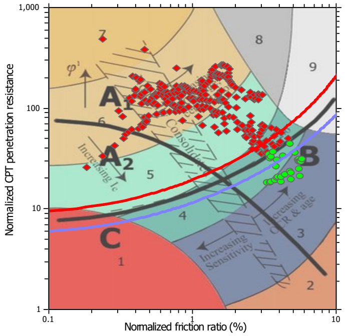
F.S. color scheme

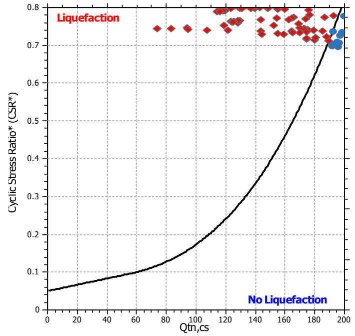
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

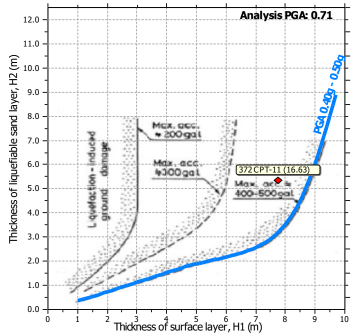
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



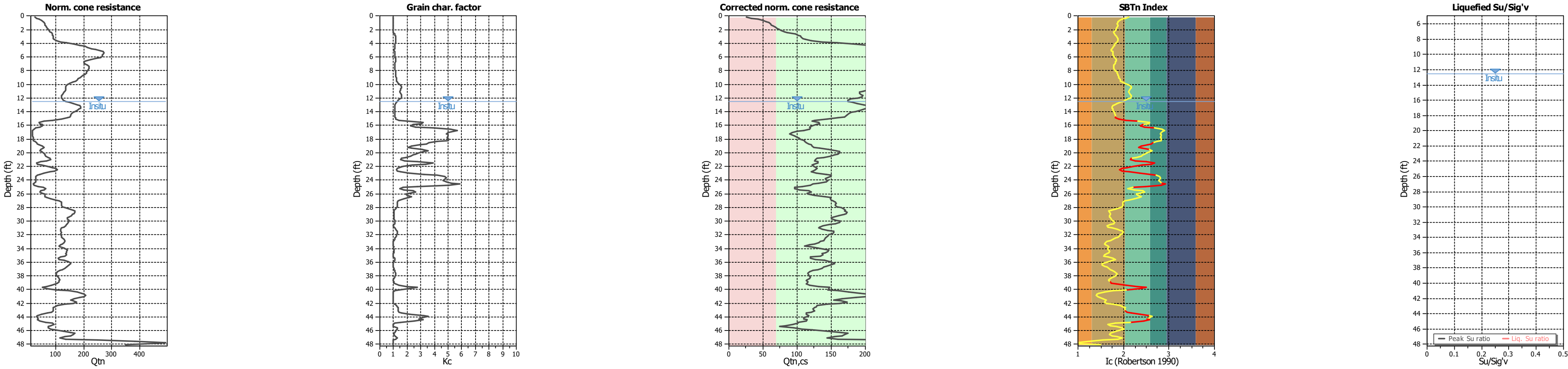




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_{σ} applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	5.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	12.50 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

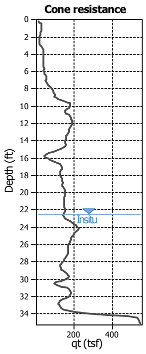
LIQUEFACTION ANALYSIS REPORT

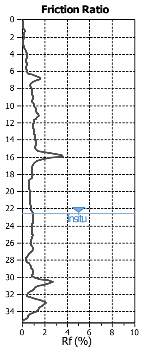
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

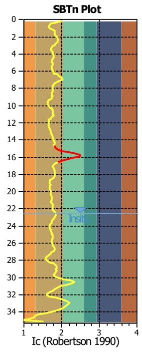
CPT file : 372CPT-12

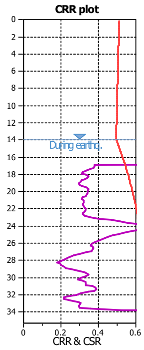
Input parameters and analysis data

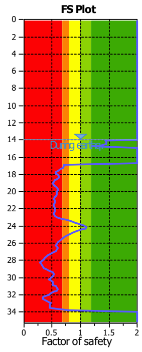
Analysis method:	Robertson (2009)	G.W.T. (in-situ):	22.50 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	14.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

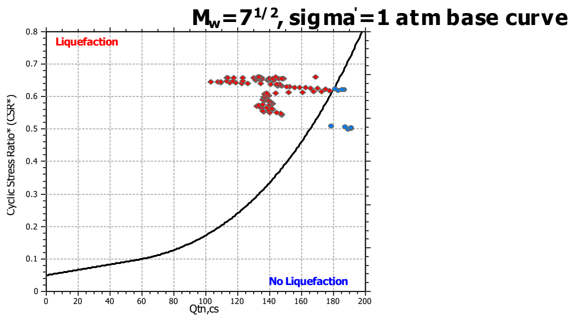


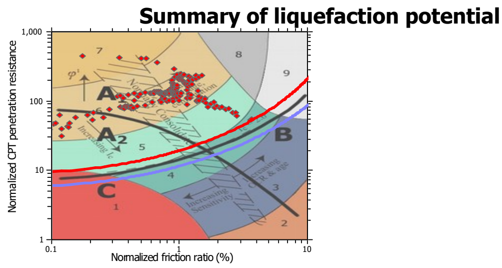






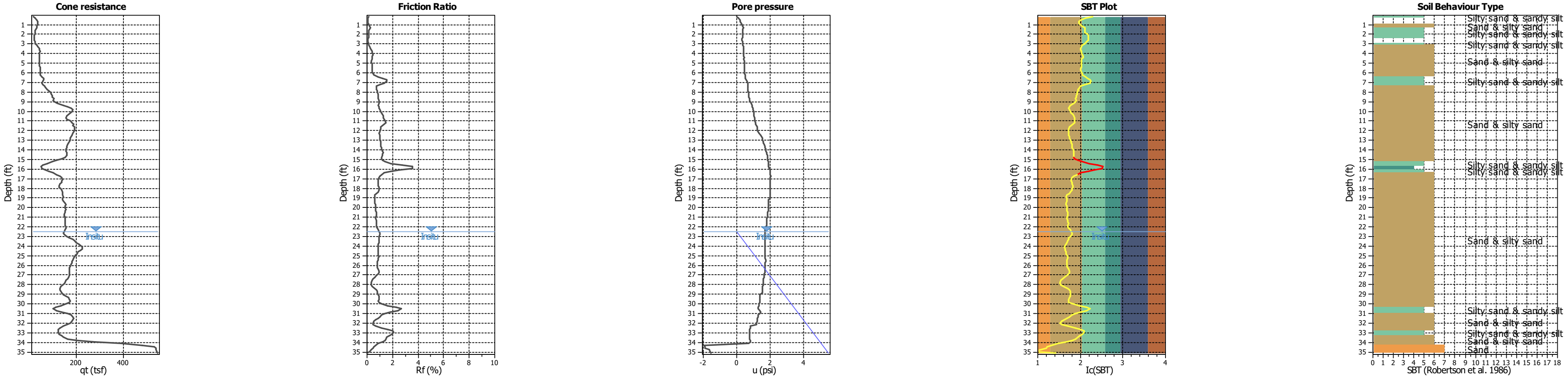






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



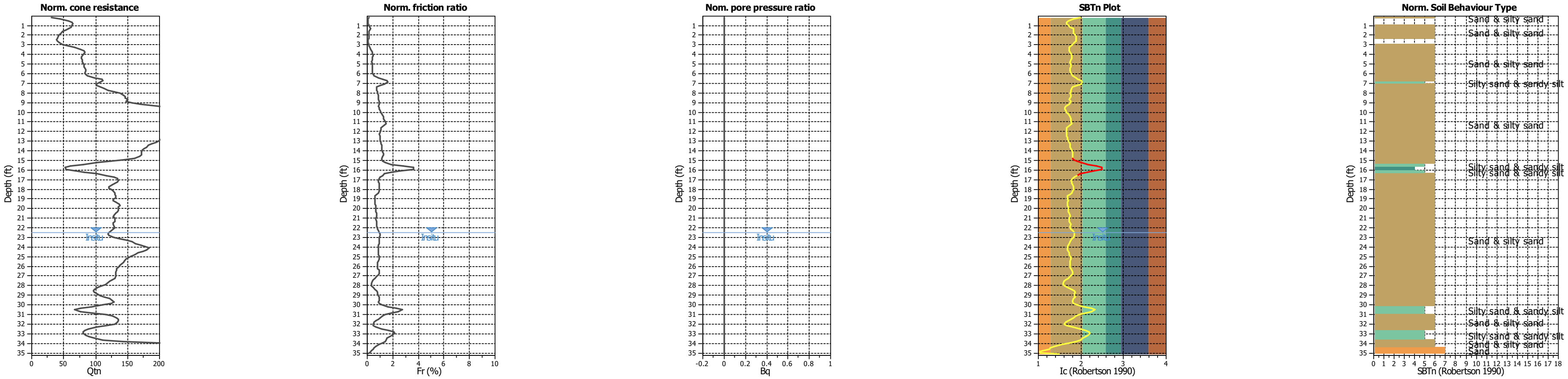
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A		
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes		
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No		
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils		
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No		
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A		

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



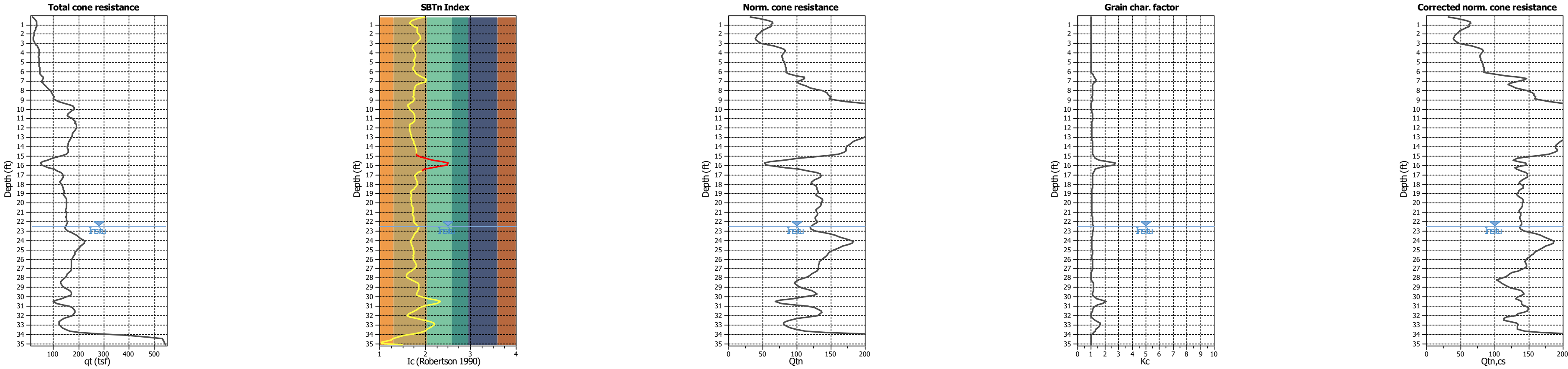
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

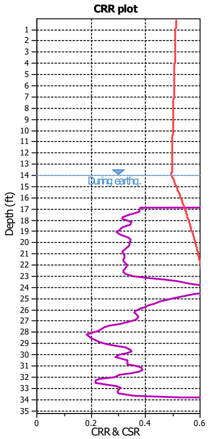
Liquefaction analysis overall plots (intermediate results)

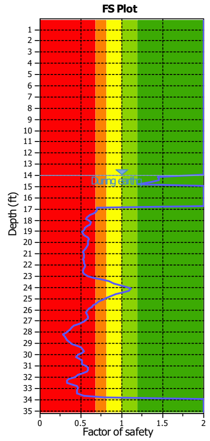


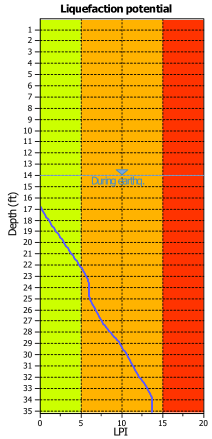
Input parameters and analysis data

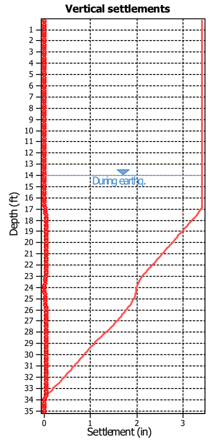
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

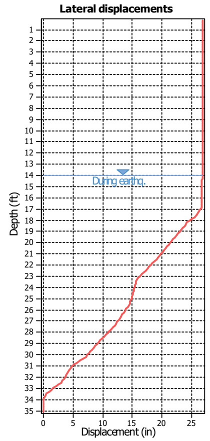
Liquefaction analysis overall plots











Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

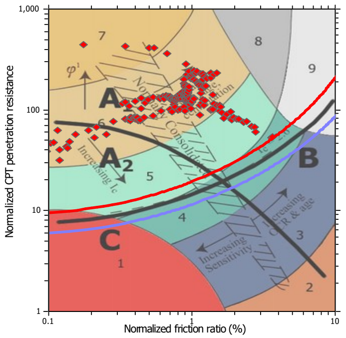
F.S. color scheme

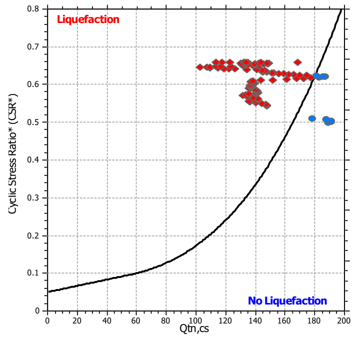
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

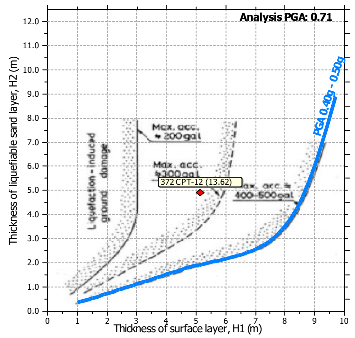
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



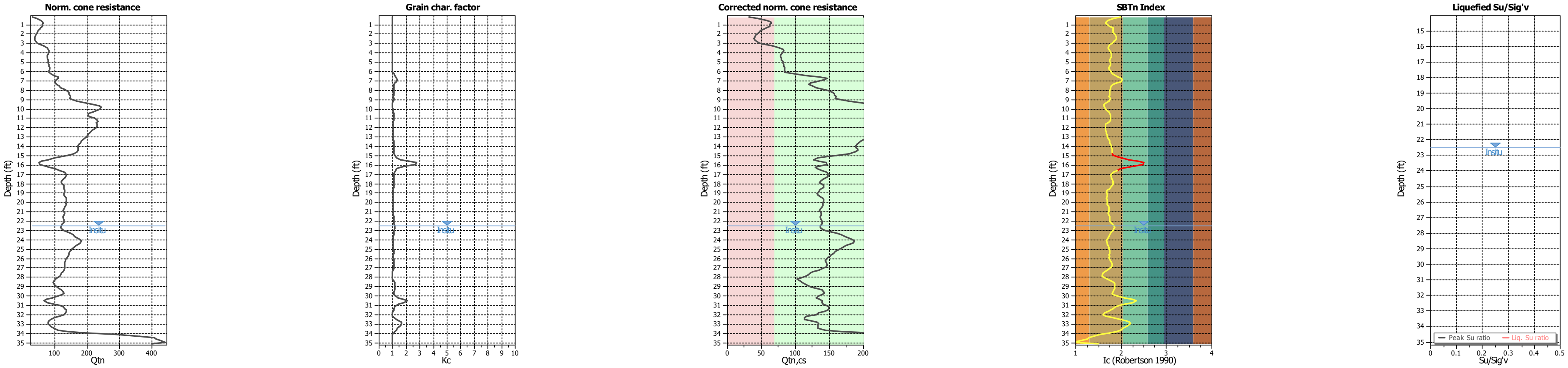




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	14.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	22.50 ft	Fill height:	N/A	Limit depth:	N/A

Inland Foundation Engineering, Inc.
Geotechnical Engineers
1310 South Santa Fe Avenue
San Jacinto, California

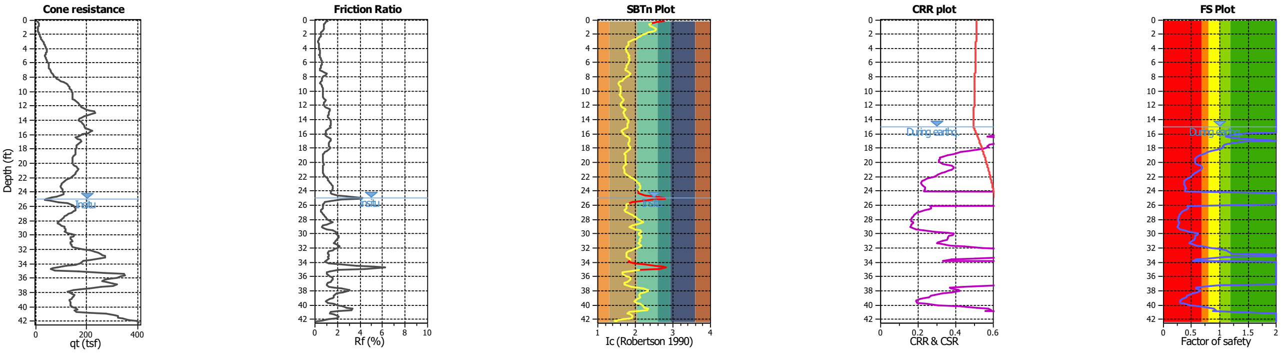
LIQUEFACTION ANALYSIS REPORT

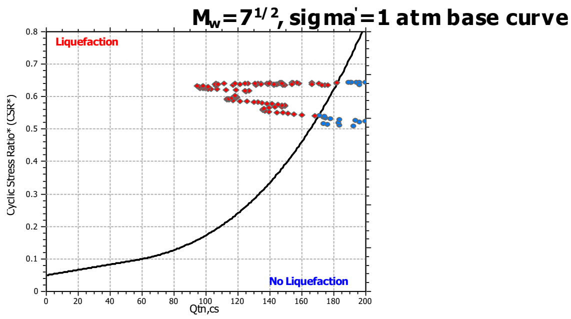
Project title : Camp Ronald McDonald 2020 Update **Location : Garner Valley, Riverside County, CA**

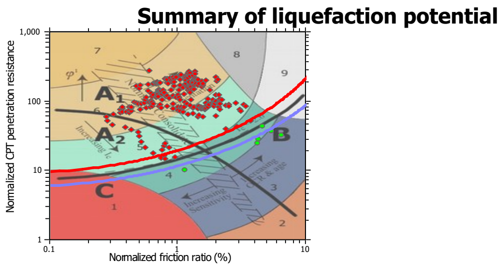
CPT file : 372CPT-13

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	25.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	15.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.80	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.71	Unit weight calculation:	Based on SBT	K_σ applied:	No		

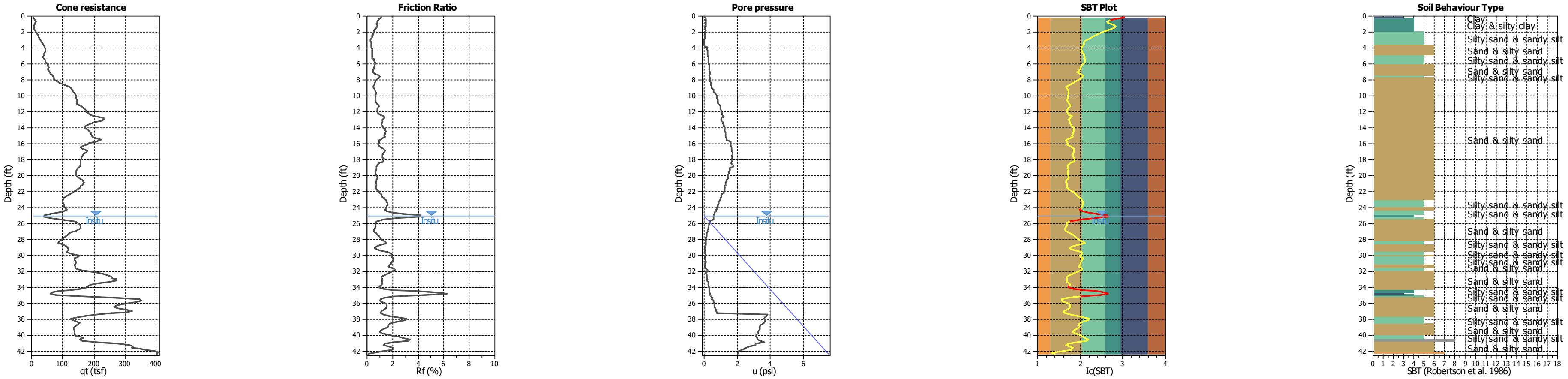






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



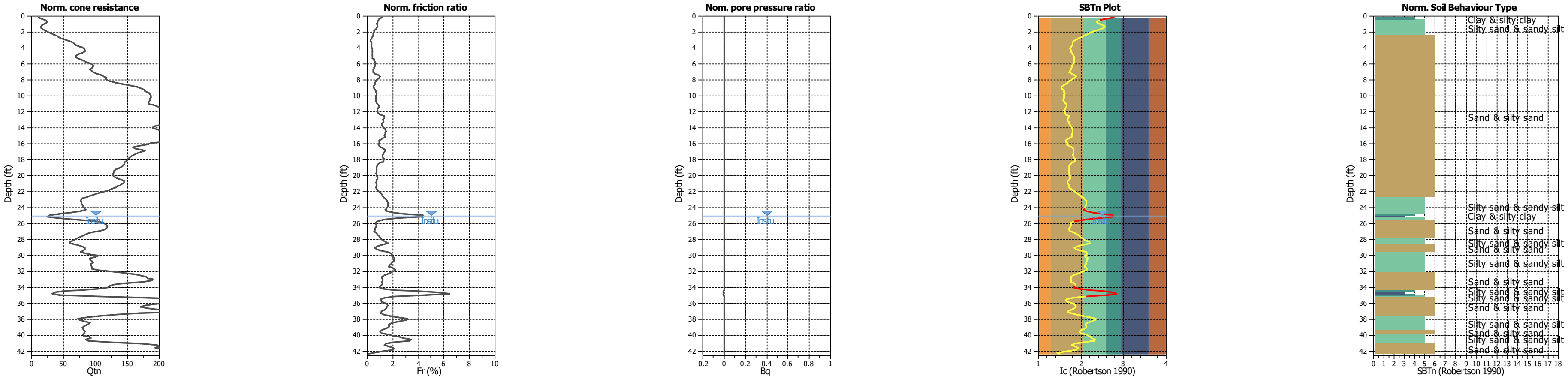
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained	4. Clayey silt to silty	7. Gravely sand to sand
2. Organic material	5. Silty sand to sandy silt	8. Very stiff sand to
3. Clay to silty clay	6. Clean sand to silty sand	9. Very stiff fine grained

CPT basic interpretation plots (normalized)



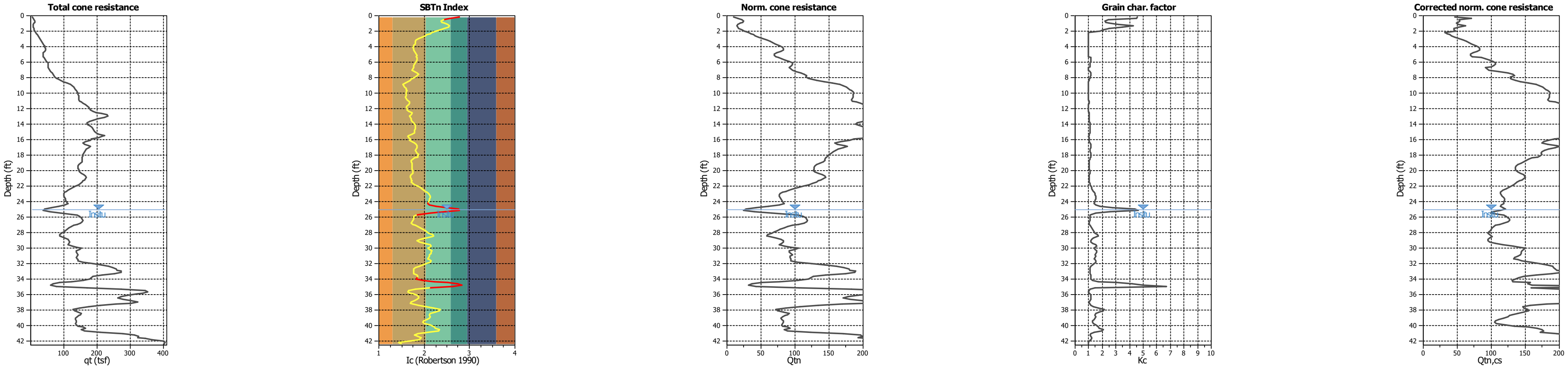
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

- 1. Sensitive fine grained
- 2. Organic material
- 3. Clay to silty clay
- 4. Clayey silt to silty
- 5. Silty sand to sandy silt
- 6. Clean sand to silty sand
- 7. Gravely sand to sand
- 8. Very stiff sand to
- 9. Very stiff fine grained

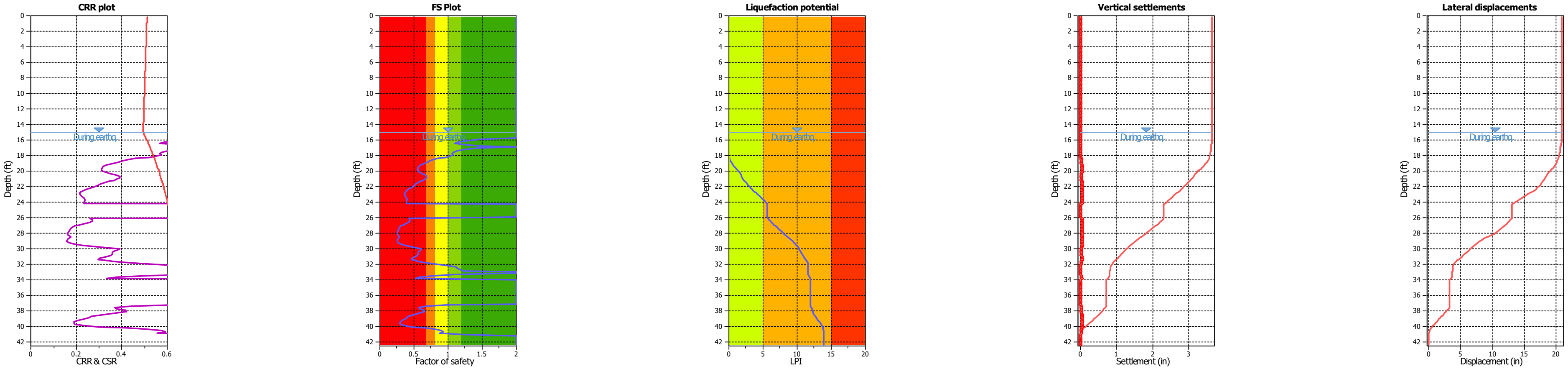
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

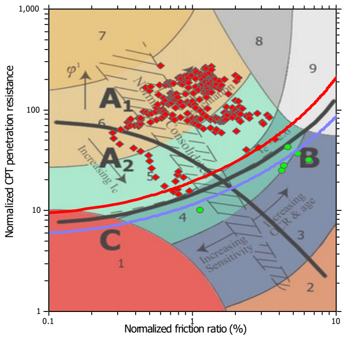
F.S. color scheme

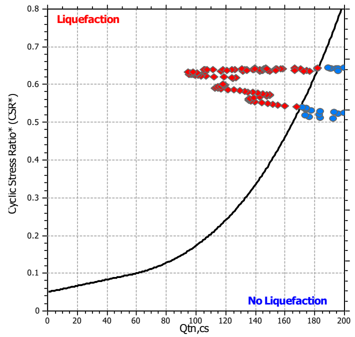
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

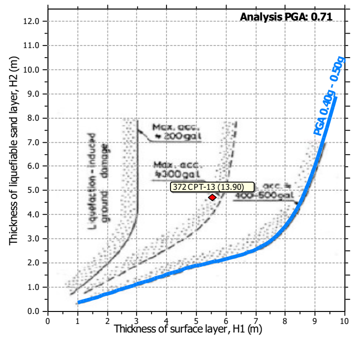
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



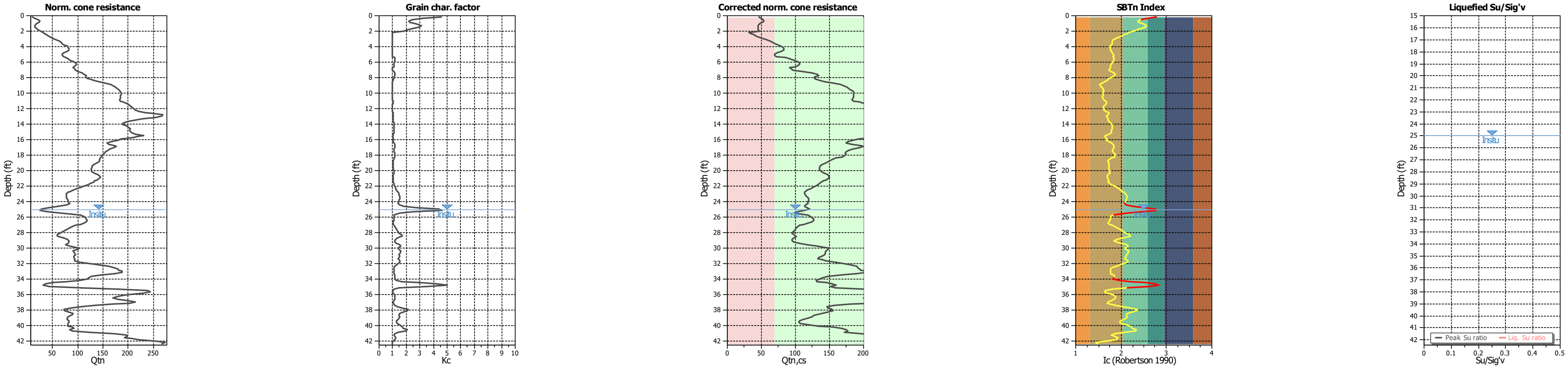




Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))

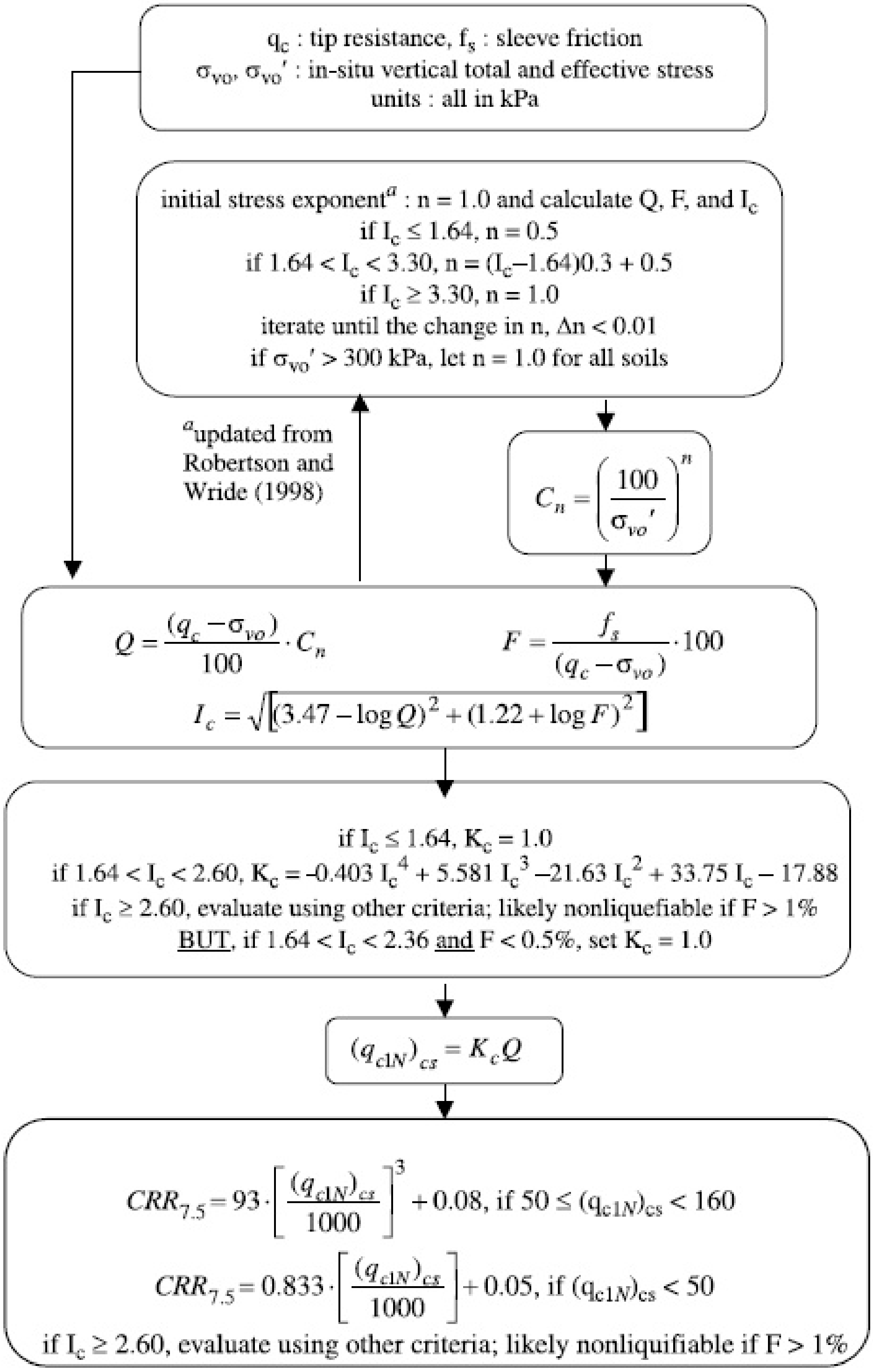


Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	15.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	7.80	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.71	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	25.00 ft	Fill height:	N/A	Limit depth:	N/A

Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

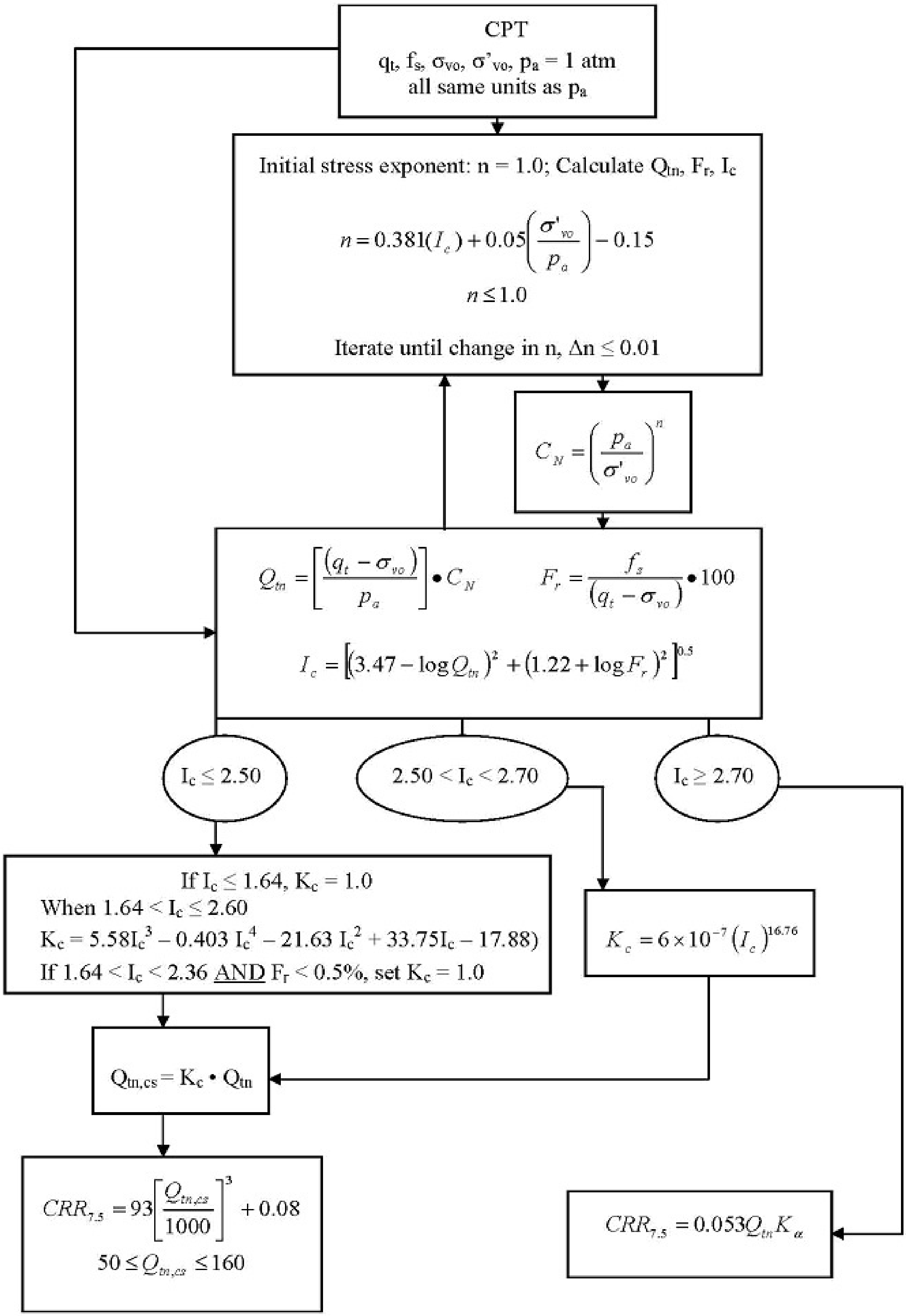
Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

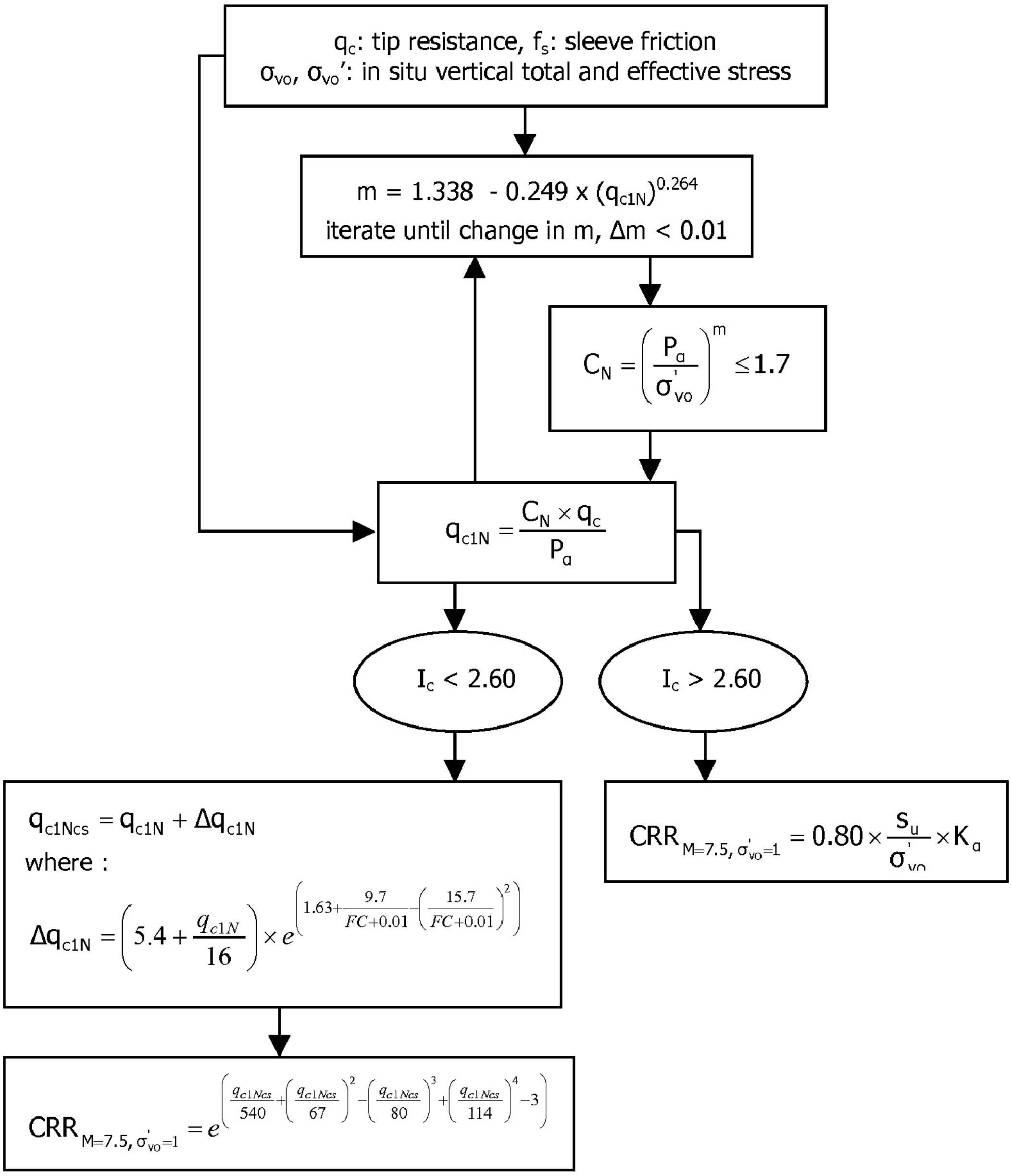
Procedure for the evaluation of soil liquefaction resistance (all soils), Robertson (2010)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. This procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:

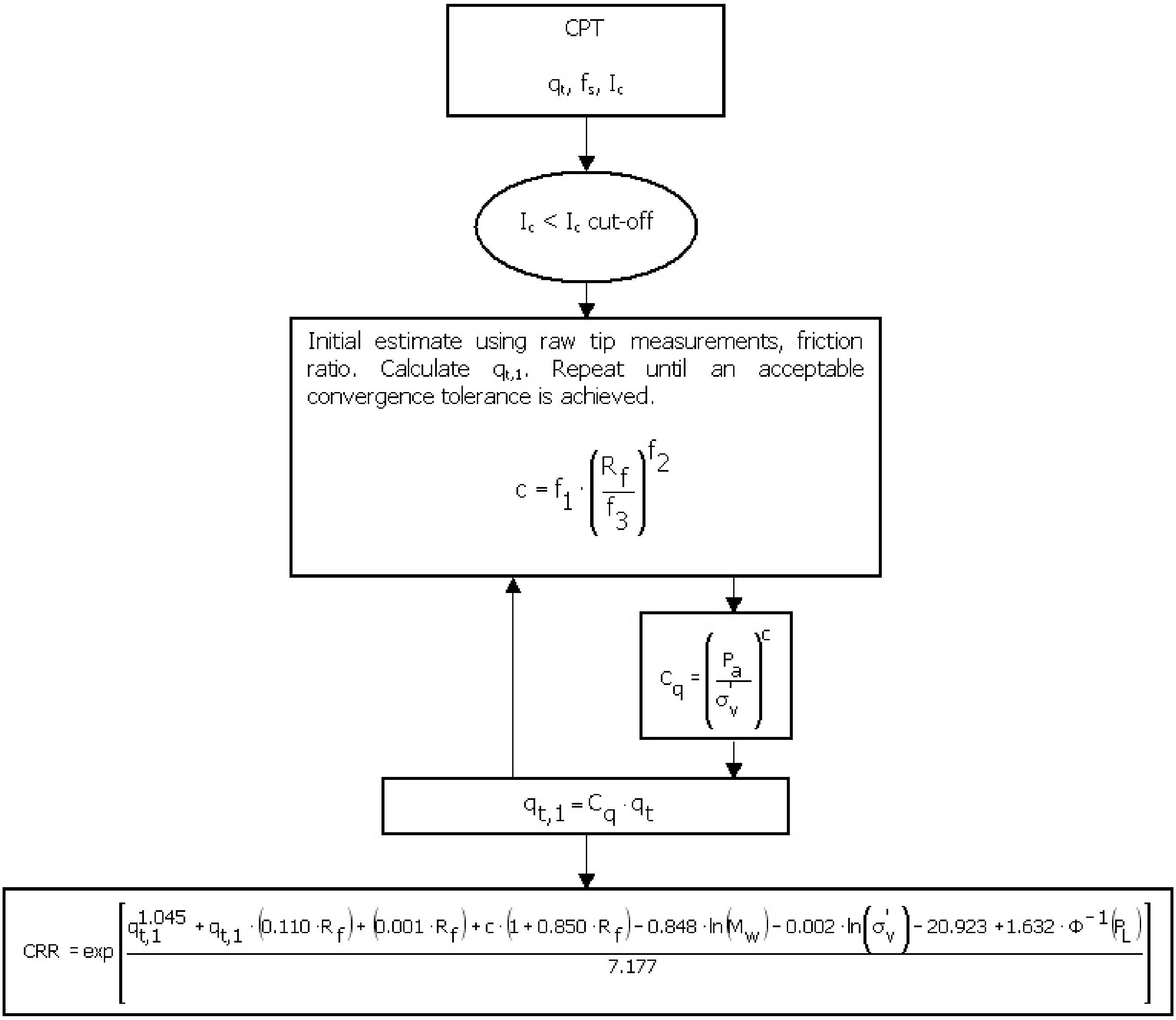


[1] P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering – from case history to practice, IS-Tokyo, June 2009

Procedure for the evaluation of soil liquefaction resistance, Idriss & Boulanger (2008)



Procedure for the evaluation of soil liquefaction resistance (sandy soils), Moss et al. (2006)



Procedure for the evaluation of soil liquefaction resistance, Boulanger & Idriss(2014)

$$FS_{liq} = \frac{CRR_{M=7.5,\sigma'_v=1atm}}{CSR_{M=7.5,\sigma'_v=1atm}}$$

$$CSR_{M=7.5,\sigma'_v=1atm} = 0.65\frac{\sigma_v}{\sigma'_v}\frac{a_{\max}}{g} r_d \frac{1}{MSF}\frac{1}{K_\sigma}$$

$$r_d = \exp\left[\alpha(z) + \beta(z)\cdot M\right]$$

$$\alpha(z) = -1.012 - 1.126\sin\left(\frac{z}{11.73} + 5.133\right)$$

$$\beta(z) = 0.106 + 0.118\sin\left(\frac{z}{11.28} + 5.142\right)$$

$$K_\sigma = 1 - C_\sigma \ln\left(\frac{\sigma'_v}{P_a}\right) \le 1.1$$

$$C_\sigma = \frac{1}{37.3 - 8.27\left(q_{c1Ncs}\right)^{0.264}} \le 0.3$$

$$MSF = 1 + \left(MSF_{max} - 1\right)\left(8.64\exp\left(\frac{-M}{4}\right) - 1.325\right)$$

$$MSF_{max} = 1.09 + \left(\frac{q_{c1Ncs}}{180}\right)^3 \le 2.2$$

σ'_v *and* σ_v *at start of earthquake shaking*

$$CRR_{M=7.5,\sigma'_v=1atm} = \exp\left(\frac{q_{c1Ncs}}{113} + \left(\frac{q_{c1Ncs}}{1000}\right)^2 - \left(\frac{q_{c1Ncs}}{140}\right)^3 + \left(\frac{q_{c1Ncs}}{137}\right)^4 - 2.80\right)$$

$$q_{c1Ncs} = q_{c1N} + \Delta q_{c1N}$$

$$\Delta q_{c1N} = \left(11.9 + \frac{q_{c1N}}{14.6}\right)\exp\left(1.63 - \frac{9.7}{FC+2} - \left(\frac{15.7}{FC+2}\right)^2\right)$$

$$q_{c1N} = C_{N}\frac{q_c}{P_a}$$

$$C_{N} = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 1.338 - 0.249\left(q_{c1Ncs}\right)^{0.264} \quad with \quad 0.264 \le m \le 0.782$$

$$FC = 80\left(I_C + C_{FC}\right) - 137 \quad with \quad 0\% \le FC \le 100\%$$

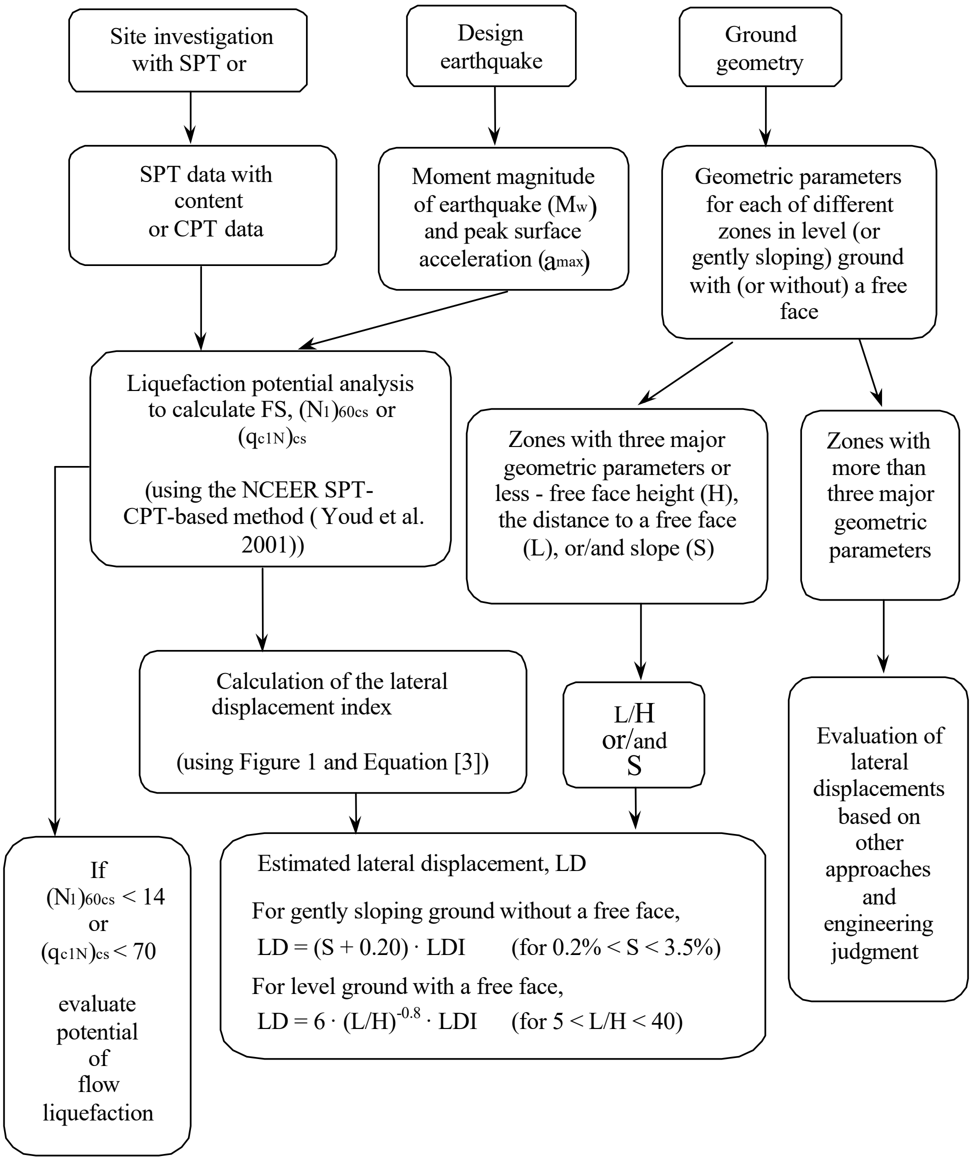
$$I_c = \left[\left(3.47 - \log(Q)\right)^2 + \left(1.22 + \log(F)\right)^2\right]^{0.5}$$

$$Q = \left(\frac{q_c - \sigma_{vc}}{P_a}\right)\left(\frac{P_a}{\sigma'_{vc}}\right)^n \; with\; 0.5 \le n \le 1.0 \; per \; Robertson \;\&\; Wride\,(1998)$$

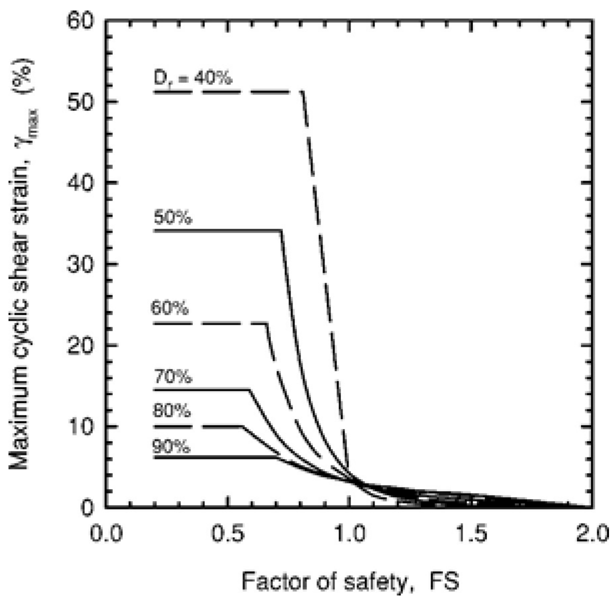
$$F = \left(\frac{f_s}{q_c - \sigma_{vc}}\right)\cdot 100\%$$

σ'_v *at time of CPT sounding*

Procedure for the evaluation of liquefaction-induced lateral spreading displacements



[1] Flow chart illustrating major steps in estimating liquefaction-induced lateral spreading displacements using the proposed approach



[1] **Figure 1**

$$\mathrm{LDI} = \int_0^{Z_{max}} \gamma_{max}\, dz$$

[1] **Equation [3]**

[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands

Average shear stress, τ_{av}

$$\tau_{av} = CSR^{*} \cdot \sigma_{v0}' = 0.65 \cdot \frac{\alpha_{max}}{g} \cdot \sigma_{v0} \cdot \tau_{a}$$

Estimate small shear strain modulus, G_0

$$G_0 = 0.0188 \cdot \left[10^{(0.55 I_c - 1.68)}\right] \cdot (q_t - \sigma_v)$$

Estimate shear strain amplitude, γ (based on Pradel (1998))

$$\gamma = \left[\frac{1 + \alpha \cdot e^{bR}}{1 + \alpha}\right] \cdot R \cdot 100\ (\%)$$

$$R = \frac{\tau_{av}}{G_0}\ (\text{Note } \tau_{av} \text{ and } G_0 \text{ same units})$$

$$\alpha = 0.0389 \cdot \left(\frac{\sigma_v}{p_a}\right) + 0.124$$

$$b = 6400 \cdot \left(\frac{\sigma_v}{p_a}\right)$$

Estimate volumetric strain in 15 cycles

$$\varepsilon_{vol(15)} = \gamma \cdot \left[\frac{(N_1)_{60,cs}}{20}\right]^{-1.20}$$

$$(N_1)_{60,cs} = \frac{Q_{tn,cs}}{8.5 \cdot \left[1 - \frac{I_c}{4.6}\right]}$$

Volumetric strain in design earthquake

$$\Sigma_{vol} = \varepsilon_{vol(15)} \cdot \left[\frac{N_c}{15}\right]^{0.45}$$

$$N_c = (M - 4)^{2.17}$$

Seismic settlement, s

$$s = 2 \cdot \int_{0}^{GWT} \Sigma_{vol} \cdot dz$$

Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

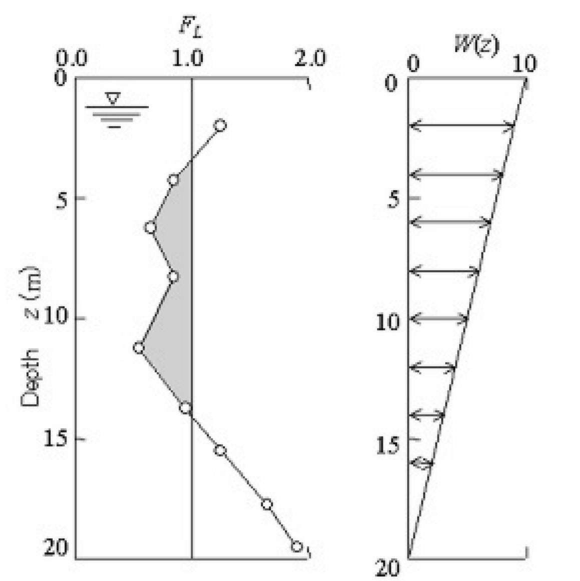
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\textbf{LPI} = \int_0^{20} (10 - 0{,}5_z) \times F_L \times d_z$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

Shear-Induced Building Settlement (Ds) calculation procedure

The shear-induced building settlement (Ds) due to liquefaction below the building can be estimated using the relationship developed by Bray and Macedo (2017):

$$Ln(Ds) = c1 + c2 * LBS + 0.58 * Ln\left(Tanh\left(\frac{HL}{6}\right)\right) +$$

$$4.59 * Ln(Q) - 0.42 * Ln(Q)^2 - 0.02 * B +$$
$$0.84 * Ln(CAVdp) + 0.41 * Ln(Sa1) + \varepsilon$$

where Ds is in the units of mm, c1= -8.35 and c2= 0.072 for LBS ≤ 16, and c1= -7.48 and c2= 0.014 otherwise. Q is the building contact pressure in units of kPa, HL is the cumulative thickness of the liquefiable layers in the units of m, B is the building width in the units of m, CAVdp is a standardized version of the cumulative absolute velocity in the units of g-s, Sa1 is 5%-damped pseudo-acceleration response spectral value at a period of 1 s in the units of g, and ε is a normal random variable with zero mean and 0.50 standard deviation in Ln units. The liquefaction-induced building settlement index (LBS) is:

$$LBS = \sum W * \frac{\varepsilon_{shear}}{z}\,dz$$

where z (m) is the depth measured from the ground surface > 0, W is a foundation-weighting factor wherein W = 0.0 for z less than Df, which is the embedment depth of the foundation, and W = 1.0 otherwise. The shear strain parameter (ε_shear) is the liquefaction-induced free-field shear strain (in %) estimated using Zhang et al. (2004). It is calculated based on the estimated Dr of the liquefied soil layer and the calculated safety factor against liquefaction triggering (FSL).

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- R. E. S. Moss, R. B. Seed, R. E. Kayen, J. P. Stewart, A. Der Kiureghian, K. O. Cetin, CPT-Based Probabilistic and Deterministic Assessment of In Situ Seismic Soil Liquefaction Potential, Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 8, August 1, 2006
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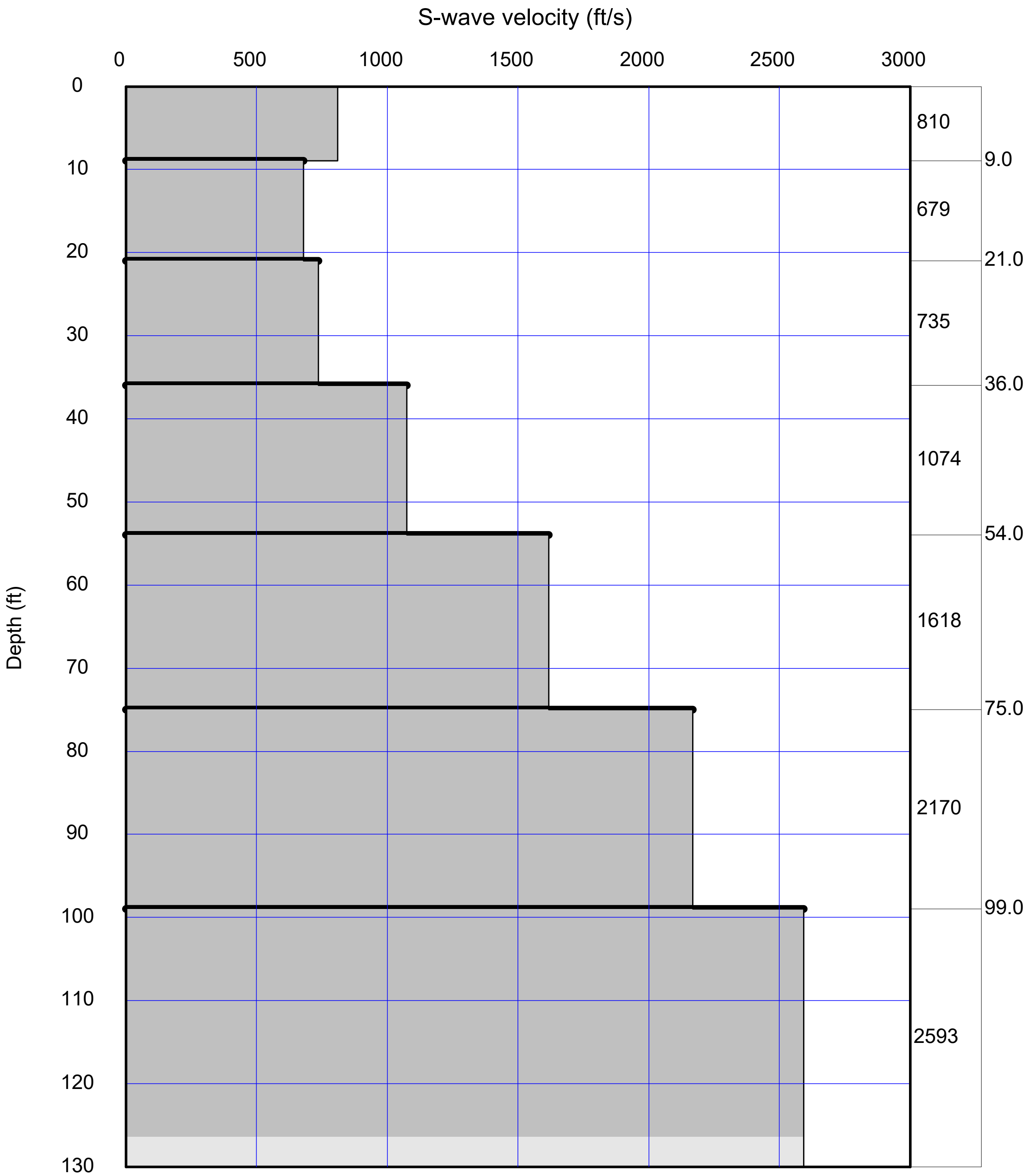
APPENDIX D –
Terra Geosciences
2020 Seismic Shear-Wave Survey



SHEAR-WAVE VELOCITY MODEL: Average Vs 100ft = 1,107.2 ft/sec

Site Classification (ASCE 7-16 Ch. 20)- "D" (Stiff Soil)

Client: **Inland Foundation Engineering, Inc., Project No. C457-007**

Project Name: **Camp Ronald McDonald, Mountain Center, California**

Survey Line End Coordinates: **33.68026, -116.67656 / 33.68013, -116.67598**

Date: **9/14/20**

PROFESSIONAL GEOPHYSICIST
DONN C. SCHWARTZKOPF
No. 1002
STATE OF CALIFORNIA

TERRA GEOSCIENCES
P.O. Box 1090
Loma Linda, CA 92354

TG Project No. 203496-1

APPENDIX E –
Site-Specific Ground Motion Analysis Survey

SEISMIC DESIGN PARAMETERS SUMMARY

Project:	Ronald McDonald Camp	Lattitude:	33.6802
Project #:	C457-007	Longitude:	-116.6763
Date:	10/2/20		

CALIFORNIA BUILDING CODE CHAPTER 16/ASCE7-16

Mapped Acceleration Parameters per ASCE 7-16, Chapter 22

S_s=	1.59	Figure 22-1
S_1=	0.618	Figure 22-2

Site Class per Table 20.3-1

Site Class=	D - Stiff Soil

Site Coefficients per ASCE 7-16 CHAPTER 11

F_a=	1	Table 11.4-1	=	1.00	For Site Specific Analysis per ASCE7-16 21.3
F_v=	1.70	Table 11.4-2	=	2.50	For Site Specific Analysis per ASCE7-16 21.3

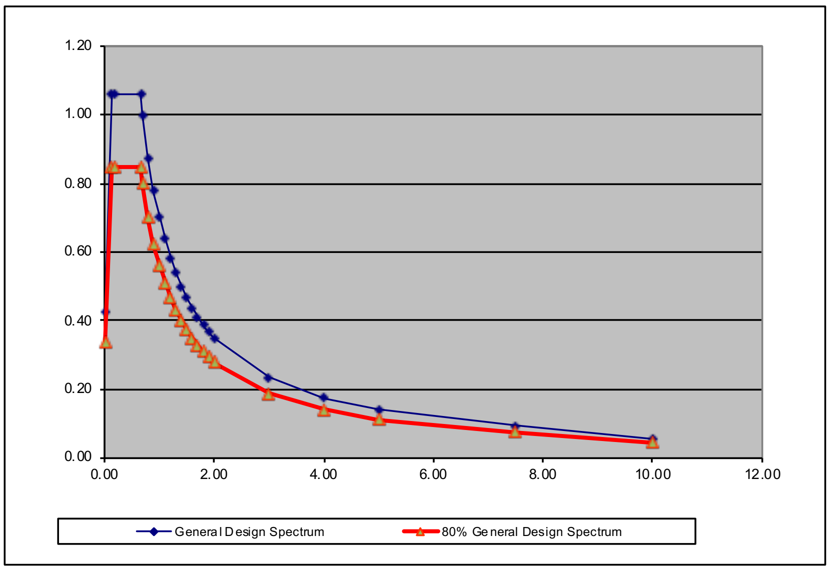
Mapped Design Spectral Response Acceleration Parameters

S_{MS}=	1.59	Equation 11.4-1	1.59	For Site Specific Analysis per ASCE7-16 21.3
S_{M1}=	1.051	Equation 11.4-2	1.545	For Site Specific Analysis per ASCE7-16 21.3

S_{DS}=	1.060	Equation 11.4-3
S_{D1}=	0.700	Equation 11.4-4

T_0=	0.132	sec	
T_S=	0.661	sec	
T_L=	8	sec	From Fig 22-12
PGA	0.674	g	
F_{PGA}=	1.1		From Table 11.8-1
C_{RS}=	0.911		Figure 22-17
C_{R1}=	0.892		Figure 22-18

Period (T)	Sa (ASCE7-16 - 11.4.6)	80% General Design Spectrum
0.01	0.42	0.340
0.13	1.06	0.848
0.20	1.06	0.848
0.66	1.06	0.848
0.70	1.00	0.800
0.80	0.88	0.700
0.90	0.78	0.623
1.00	0.70	0.560
1.10	0.64	0.509
1.20	0.58	0.467
1.30	0.54	0.431
1.40	0.50	0.400
1.50	0.47	0.374
1.60	0.44	0.350
1.70	0.41	0.330
1.80	0.39	0.311
1.90	0.37	0.295
2.00	0.35	0.280
3.00	0.23	0.187
4.00	0.18	0.140
5.00	0.14	0.112
7.50	0.09	0.075
10.00	0.06	0.045



ASCE 7-16 - RISK-TARGETED MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION ANALYSIS

Use Maximum Rotated Horizontal Component?* (Y/N) y

Presented data are the average of Chiou & Youngs (2014), Abrahamson et. al. (2014) , Boore et. al (2014) and Campbell & Bozorgnia (2014) NGA West-2 Relationships
Earthquake Rupture Forecast - UCERF3 Single Branch ERF, Fault Model 3.1

PROBABILISTIC MCER per 21.2.1.1 **Method 1**

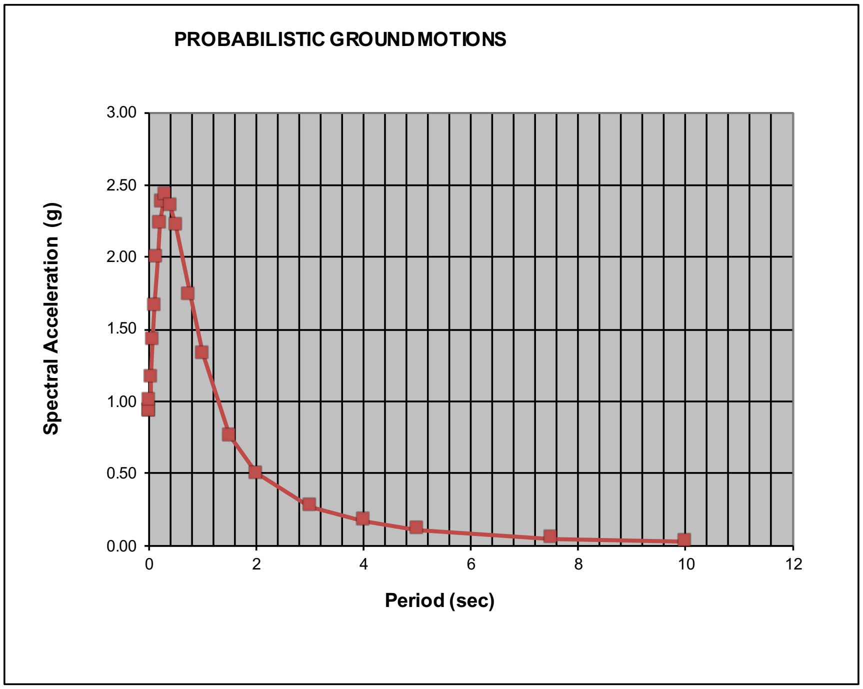
Risk Coefficients taken from Figures 22-18 and 22-19 of ASCE 7-16

OpenSHA data

2% Probability Of Exceedance in 50 years

Maximum Rotated Horizontal Component determined per ASCE7-16 Ssection 21.2

T	Sa 2% in 50	MCER
0.01	1.02	0.93
0.02	1.03	0.94
0.03	1.10	1.01
0.05	1.29	1.17
0.08	1.57	1.43
0.10	1.83	1.67
0.15	2.20	2.00
0.20	2.45	2.23
0.25	2.62	2.39
0.30	2.67	2.43
0.40	2.59	2.35
0.50	2.45	2.22
0.75	1.94	1.74
1.00	1.49	1.33
1.50	0.85	0.76
2.00	0.56	0.50
3.00	0.30	0.27
4.00	0.19	0.17
5.00	0.13	0.12
7.50	0.06	0.05
10.00	0.03	0.03



S_s=	2.45	2.23
S_1=	1.49	1.33
PGA	0.87 g	

Risk Coefficients:			
C_{RS}	0.911	Figure 22-18	Get from Mapped Values
C_{R1}	0.892	Figure 22-19	
Fa=	1	Table 11.4-1	Per ASCE7-16 - 21.2.3
Is $Sa_{(max)}$<1.2XFa?		NO	If "YES", Probabilistic Spectrum prevails

DETERMINISTIC MCE per 21.2.2

Input Parameters		San Jacinto Fault
Fault		
M	= Moment magnitude	7.8
R_{RUP}	= Closest distance to coseismic rupture (km)	7.8
R_{JB}	= Closest distance to surface projection of coseismic rupture (km)	7.8
Rx	= Horizontal distance to top edge of rupture measured perpendicular to strike (km)	7.8
U	= Unspecified Faulting Flag (Boore et.al.)	0
F_{RV}	= Reverse-faulting factor: 0 for strike slip, normal, normal-oblique; 1 for reverse, reverse-oblique and thrust	0
F_{NM}	= Normal-faulting factor: 0 for strike slip, reverse, reverse-oblique and thrust; 1 for normal and normal-oblique	0
F_{HW}	= Hanging-wall factor: 1 for site on down-dip side of top of rupture; 0 otherwise, used in AS08 and CY08	0
Z_{TOR}	= Depth to top of coseismic rupture (km)	0
δ	= Average dip of rupture plane (degrees)	90
V_{S30}	= Average shear-wave velocity in top 30m of site profile	337.5
$F_{Measured}$		1
$Z_{1.0}$	= Depth to Shear Wave Velocity of 1.0 km/sec (km)	0.1
$Z_{2.5}$	= Depth to Shear Wave Velocity of 2.5 km/sec (km)	0.5
Site Class		D
W (km)	= Fault rupture width (km)	15
F_{AS}	= 0 for mainshock; 1 for aftershock	0
σ	=Standard Deviation	1

Deterministic Summary - Section 21.2.2 (Supplement 1)

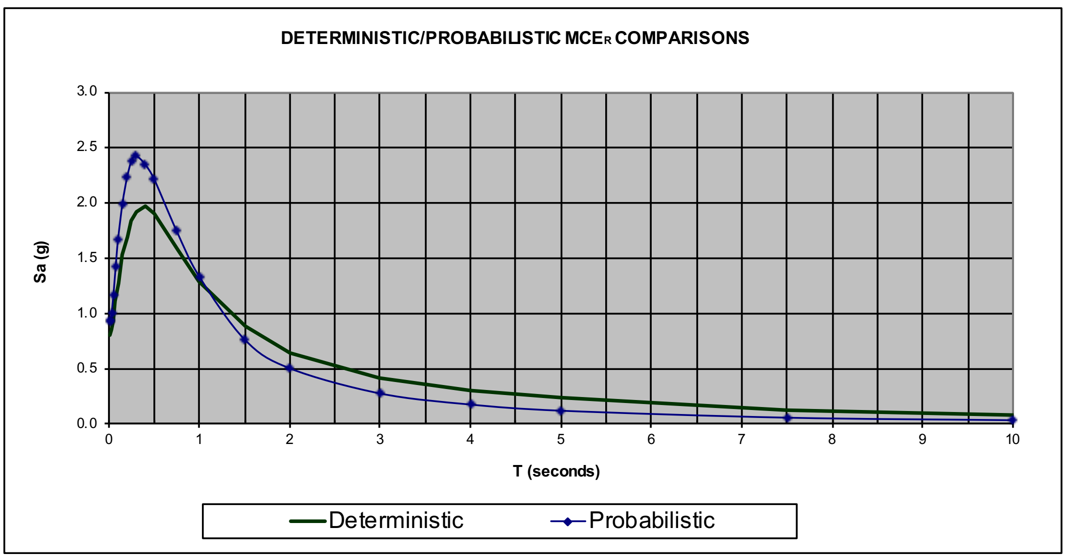
T	Median S_a (Average)	Corrected* S_a (per ASCE7-16)	Scaled $S_{a(Average)}$	
0.010	0.73	0.80	0.80	
0.020	0.77	0.84	0.84	
0.030	0.77	0.85	0.85	
0.050	0.85	0.93	0.93	
0.075	1.01	1.11	1.11	
0.100	1.16	1.28	1.28	
0.150	1.39	1.53	1.53	
0.200	1.54	1.70	1.70	
0.250	1.65	1.84	1.84	
0.300	1.71	1.92	1.92	
0.400	1.71	1.97	1.97	
0.500	1.62	1.91	1.91	
0.750	1.28	1.58	1.58	
1.000	1.00	1.30	1.30	
1.500	0.66	0.88	0.88	
2.000	0.47	0.63	0.63	
3.000	0.30	0.42	0.42	
4.000	0.21	0.31	0.31	
5.000	0.16	0.24	0.24	
7.500	0.08	0.13	0.13	
10.000	0.05	0.08	0.08	
PGA	0.71		0.71	g
Max Sa=	1.97			
Fa =	1.00	Per ASCE7-16 21.2.2		
1.5XFa=	1.5			
Scaling Factor=	1.00			

* Correction is the adjustment for Maximum Rotated Value if Applicable

SITE SPECIFIC MCE_R - Compare Deterministic MCE_R Values (S_a) with Probabilistic MCE_R Values (S_a) per 21.2.3

Presented data are the average of Chiou & Youngs (2014), Abrahamson et. al. (2014) , Boore et. al (2014) and Campbell & Bozorgnia (2014) NGA West-2 Relationships

Period T	Deterministic MCE_R	Probabilistic MCE_R	Lower Value (Site Specific MCE_R)	Governing Method
0.010	0.80	0.93	0.80	Deterministic Governs
0.020	0.84	0.94	0.84	Deterministic Governs
0.030	0.85	1.01	0.85	Deterministic Governs
0.050	0.93	1.17	0.93	Deterministic Governs
0.075	1.11	1.43	1.11	Deterministic Governs
0.100	1.28	1.67	1.28	Deterministic Governs
0.150	1.53	2.00	1.53	Deterministic Governs
0.200	1.70	2.23	1.70	Deterministic Governs
0.250	1.84	2.39	1.84	Deterministic Governs
0.300	1.92	2.43	1.92	Deterministic Governs
0.400	1.97	2.35	1.97	Deterministic Governs
0.500	1.91	2.22	1.91	Deterministic Governs
0.750	1.58	1.74	1.58	Deterministic Governs
1.000	1.30	1.33	1.30	Deterministic Governs
1.500	0.88	0.76	0.76	Probabilistic Governs
2.000	0.63	0.50	0.50	Probabilistic Governs
3.000	0.42	0.27	0.27	Probabilistic Governs
4.000	0.31	0.17	0.17	Probabilistic Governs
5.000	0.24	0.12	0.12	Probabilistic Governs
7.500	0.13	0.05	0.05	Probabilistic Governs
10.000	0.08	0.03	0.03	Probabilistic Governs



DESIGN RESPONSE SPECTRUM per Section 21.3

DESIGN ACCELERATION PARAMETERS per Section 21.4 (MRSA)

Period	2/3*MCE$_R$	80% General Design Response Spectrum (per ASCE 7-16 Figure 11.4-1)	Design Response Spectrum	TXSa
0.01	0.54	0.38	0.54	
0.02	0.56	0.42	0.56	
0.03	0.57	0.45	0.57	
0.05	0.62	0.53	0.62	
0.08	0.74	0.63	0.74	
0.10	0.85	0.72	0.85	
0.15	1.02	0.85	1.02	
0.20	1.13	0.85	1.13	
0.25	1.22	0.85	1.22	
0.30	1.28	0.85	1.28	
0.40	1.31	0.85	1.31	
0.50	1.27	0.85	1.27	
0.75	1.05	0.85	1.05	
1.00	0.86	0.82	0.86	0.86
1.50	0.51	0.55	0.55	0.82
2.00	0.33	0.41	0.41	0.82
3.00	0.18	0.27	0.27	0.82
4.00	0.11	0.21	0.21	0.82
5.00	0.08	0.16	0.16	0.82
7.50	0.04	0.11	0.11	
10.00	0.02	0.07	0.07	

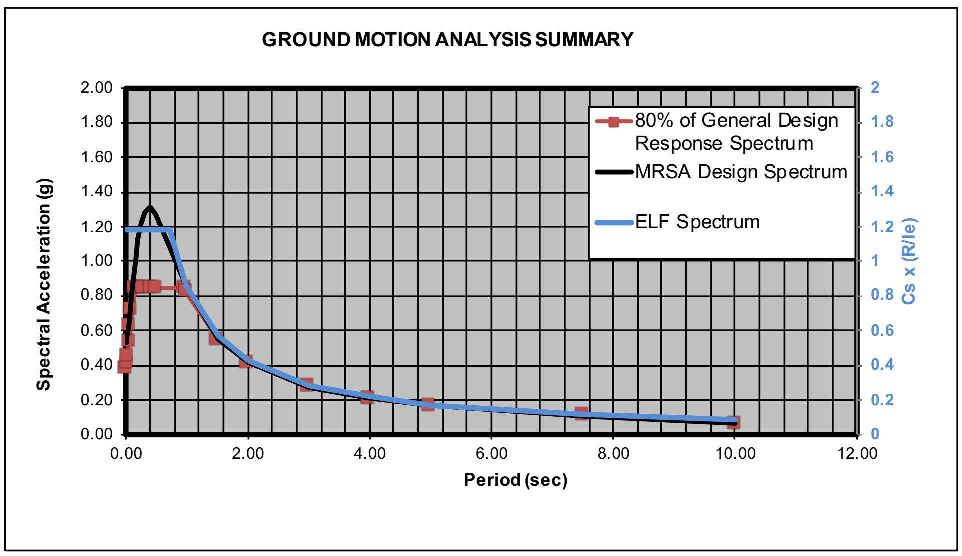
Highest value of S_a for any period exceeding 0.2 sec.=	1.31
90%of Highest Value =	1.18
Maximum TSa from T=1s-5s =	0.86

S_{DS}=	1.18
S_{D1}=	0.86
T_S =	0.73

S_{MS}=	1.775
S_{M1}=	1.295

PGA Determination:

Site Coefficient F_{PGA}=	1.1	
Mapped PGA=	0.67	Figure 22-7
PGA_M =	0.74	g
Deterministic PGA =	0.71	g
Probabilistic PGA =	0.87	g
Lesser of Deterministic/Probabilistic =	0.71	g
80% of PGA_{M}=	0.59	g
MCE_G PGA=	0.71	g



A PHASE I CULTURAL RESOURCES ASSESSMENT

OF

CAMP RONALD MCDONALD FOR GOOD TIMES

± 59.0 ACRES OF LAND NEAR MOUNTAIN CENTER
RIVERSIDE COUNTY, CALIFORNIA
USGS IDYLLWILD, CALIFORNIA QUADRANGLE, 7.5' SERIES

by

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Cultural Resources Consultant
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Prepared For:

May 2008

Camp Ronald McDonald for Good Times
1954 Cotner Avenue
Los Angeles, CA 90025-5502

LIST OF FIGURES

MANAGEMENT SUMMARY

An updated Phase I Cultural Resources Assessment of Camp Ronald McDonald for Good Times (hereafter, Camp Ronald McDonald) was requested by the project sponsor, Camp Ronald McDonald for Good Times. The subject property encompasses ±59.0 acres of land located north of Apple Canyon Road and east of State Highway 74 near the community of Mountain Center in central Riverside County. The proposed project is the redevelopment of existing Camp Ronald McDonald for Good Times, a cost-free medically-supported camp for children with cancer and their families.

The purpose of the cultural resources assessment was two-fold: 1) information was to be obtained pertaining to previous land uses of the subject property through research and a comprehensive field survey, and 2) a determination was to be made if, and to what extent, existing cultural resources would be adversely impacted by the proposed project.

Fifty-five acres of the subject property were included in a Phase I Cultural Resources Assessment conducted in 1994. During the course of the field survey for that study, several buildings and structures were observed that comprised a portion of Camp Mesorah, formerly known as Camp Roosevelt. Despite extensive research, a specific construction date (1952) could only be found for three of the Camp Roosevelt buildings and those buildings were not located within the project boundaries but instead, were built on San Bernardino National Forest land. Cartographic and archival evidence indicated that the remaining buildings comprising Camp Roosevelt – both on and off the subject property – were constructed between 1955 and 1994, but more precise dates of construction could not be ascertained. The 1994 study noted that all of the Camp Roosevelt buildings had been extensively altered and that most were in very poor condition.

In addition to the buildings and structures comprising Camp Roosevelt, two cultural resource occurrences were recorded in 1994, both of which were probably associated with the camp. The first, located in a cluster of buildings near the swimming pool and apparently the work of young camp artists, was a low granitic rock on which was painted a 'scary face' in blue oil-based paint. Since the feature was not temporally diagnostic and its historicity could not be determined, recordation was deemed sufficient consideration. The second cultural resource occurrence, located on a western terrace above the watercourse bisecting the southern 40 acres of the property, was an area in which +45 rocks had been placed in a rectangular formation measuring 1.2 x 2.0 meters. While somewhat resembling a grave, the formation was not deemed to be of Native American origin, but beyond that determination, no information regarding its origin, function, function, or age was forthcoming. Since the rock formation was within a 100-year floodplain and removed from camp development, the project sponsor chose to preserve the feature through avoidance.

The former Camp Roosevelt was purchased by Camp Ronald McDonald for Good Times in 1994 and has been in operation since that time, primarily utilizing buildings constructed for Camp Roosevelt and subsequent users. As noted in the original Phase I Cultural Resources Assessment, most of the buildings were in very poor condition in 1994 and despite extensive refurbishing over the past 14 years they have continued to deteriorate to the point where camp safety may be an issue. Instead of continuing to repair the buildings, the project sponsor proposed redevelopment of the site with new buildings and structures to replace those currently existing. As part of the environmental review process for the proposed redevelopment, Riverside County required an updated Phase I Cultural Resources Assessment of the subject property which, since the 1994 study, has increased in size to ±59.0 acres of land.

Numerous cultural resources of both contemporary and historical origin were observed within the project boundaries during the current field survey; no cultural resources of prehistoric (i.e. Native American) were observed. Twenty-seven buildings currently comprise Camp Ronald McDonald, although two of the buildings are located outside the subject property boundaries on San Bernardino National Forest land. Camp buildings include a dining hall, office, kid's kitchen, two caretakers' houses and a mobilehome, a medical complex, costume shed, art building, bike garage, fire suppression center, storage buildings, and several cabins of varying sizes. In addition to the camp buildings there are a number of structures, including a pool, shower house/tent, archery range, campfire, pond, the Bob Chandler Courage Course, old teepees, new teepees, volleyball court, basketball court, an activity tent, corrals, a bridge, and a stone entry monument. Miscellaneous concrete pads, benches hewn from logs, and many trails are scattered throughout the property.

While the medical center and fire suppression center are clearly of recent construction, the remaining buildings within Camp Ronald McDonald are temporally ambiguous. This is primarily due to the fact that every vernacular building has been subject to substantial alterations by various users of the property, thus blurring the line between original and subsequent construction, historical and contemporary origin. The majority of these buildings have new roofs and new doors, while all have had original wood frame windows replaced by aluminum slider or louvered windows. New decks, stairs, and wheelchair ramps have been added to virtually every camp building to facilitate usage by Camp Ronald McDonald guests. Plywood-clad toilet rooms have been built on to many cabins and various types of cladding found on single buildings indicate room additions and removals.

The problem of determining historicity is further exacerbated by contradictory cartographic evidence. Building configurations on available maps differ markedly from each other and from the current configuration of Camp Ronald McDonald so it is difficult to determine the sequence and dates of construction. The original Special Use Permit, issued on February 26, 1952 to Camp Roosevelt, Inc. by the U.S. Forest Service, was for a residence and 2 ½ bunkhouses on 10 acres of San Bernardino National Forest land. The permit was a resolution to an encroachment problem that arose when a boundary survey discovered the buildings and other improvements on federal land. Instead of the government taking a trespass action for the removal of the buildings, it issued the Special Use Permit with the caveat that the private land use was not a long term condition. No information is available regarding the actual construction date of the residence and bunkhouses, only when they were discovered. These buildings are currently located near the southwestern corner of Camp Ronald McDonald. On January 1, 1956 the permit was revised to increase Camp Roosevelt by an additional 20 acres, but no mention is made of adding more buildings and permission would seemingly be unlikely considering the fact that they would be encroaching on federal land. Yet by 1959 two additional buildings appear within forest land (now the office and dining hall) and an additional 13 buildings are located on private land to the north, for a total of 18 Camp Roosevelt buildings. Since all of the original 18 buildings are 50 years of age or older, they would be classified as historical structures, yet whether they are still in existence is difficult to accurately discern. However, the fact that none of the existing buildings within Camp Ronald McDonald have maintained historical integrity is clear.

From 1952 until 1972, Camp Roosevelt was run as an organizational camp for Jewish young people. That portion of the camp situated on private land was sold to Pilgrim Schole Corporation, a "free spirit type school," in early 1972 and the Special Use Permit for the forest land portion was transferred to the school, re-classified as an Educational Center, and the SUP reduced the permitted acreage from 30 acres to 13.06 acres, which was the amount actually necessary to support the school. The school operated until 1975 when it defaulted and title reverted to the property owner and operator of Camp Roosevelt, Dan Slater. On May 22, 1975 The U.S. Forest Service issued a SUP for an organizational camp (Roosevelt Meadows) to Slater, although the camp was never actually used as an organizational camp. In 1975 Slater leased the property to "My Family", a drug rehabilitation program sponsored by Riverside County. The length of time My Family operated is uncertain, but on February 10, 1978 Mr. Slater requested permission to sublease the Camp Roosevelt property to the California Conservation Corps for establishment of a camp. The C.C.C. camp apparently operated until sometime prior to 1984, although again, substantive information is not available. regarding the specific dates of operation. In 1988 Dan Slater finally sold Camp Roosevelt to Joe Bobker, who established Camp Mesorah on a portion of the property. In 1994 Bobker sold the privately-owned portion of the land to Camp Ronald McDonald for Good Times, which has been in operation since that time.

The proposed Camp Ronald McDonald for Good Times redevelopment entails demolishing all existing buildings with the exception of the dining hall and those of recent construction, and replacing them with new camp facilities. Since at least some of these buildings are of historical origin in that they were constructed at least 50 years ago, all existing buildings, as well as the former Camp Roosevelt site itself, were evaluated for significance according to California Environmental Quality Act (CEQA) criteria. This evaluation determined that neither the buildings nor the Camp Roosevelt site would be considered significant historical resources. Due to differing cartographic evidence, it is unclear precisely which buildings were constructed prior to 1959. Further, every potentially historical building has been subject to substantial alteration, and thus is lacking integrity. Camp Roosevelt operated from 1952 to 1972, so only a short period of time would be classified as an historical occupation. Between 1972 and 2008, the subject property was occupied by several entities, so there is no continuity of use or prolonged association with the historical Camp Roosevelt. Therefore, based on a finding of no significance, the research, photo-documentation, detailed description, and architectural evaluation of the buildings and structures, as documented within this report, is sufficient consideration for cultural resources currently located within the boundaries of Camp Ronald McDonald for Good Times and neither further research nor mitigation is recommended. Should subsurface cultural resources be discovered during earthmoving activities, however, said activities shall be halted or diverted until a qualified archaeologist can evaluate the resources and make appropriate recommendations.

INTRODUCTION

In compliance with California Environmental Quality Act (CEQA) and County of Riverside requirements, the project sponsor contracted with Jean A. Keller, Ph.D., Cultural Resources Consultant, to conduct an updated Phase I Cultural Resources Assessment of the subject property. The purpose of the assessment was to identify, evaluate, and recommend mitigation measures for existing cultural resources that may be adversely impacted by the proposed development.

The Phase I Cultural Resources Assessment commenced with a review of maps, site records, and reports at the California Archaeological Inventory and California Historical Resources Information System/ Eastern Information Center at the University of California, Riverside. A request for a Sacred Lands File search was submitted concurrently to the Native American Heritage Commission and project scoping letters were sent to nine tribal representatives listed as being interested in project development in the Mountain Center/Idyllwild area. A literature search of available publications and archival materials pertaining to the subject property followed the records and Sacred Lands File searches. Finally, a comprehensive on-foot field survey of the subject property was conducted for the purpose of locating, documenting, and evaluating all existing cultural resources within its boundaries.

The proposed project is the redevelopment of Camp Ronald McDonald for Good Times, a cost-free medically-supported camp for children with cancer and their families (Fig. 1). As shown on the USGS Idyllwild, California Topographic Map, 7.5' series, the subject property encompasses ±59.0 acres of land located in the center of Section 4, Township 6 south, Range 3 east, SBM (Fig. 2). Current land use is the Apple Canyon Center, through which Camp Ronald McDonald for Good Times has operated since 1994. Adjacent land use is Herkey Creek Park to the west, the San Bernardino National Forest to the north and south, and vacant to the east. Disturbances to the property are substantial and represent cumulative impacts resulting from camp and private school operation for the past 50 years.

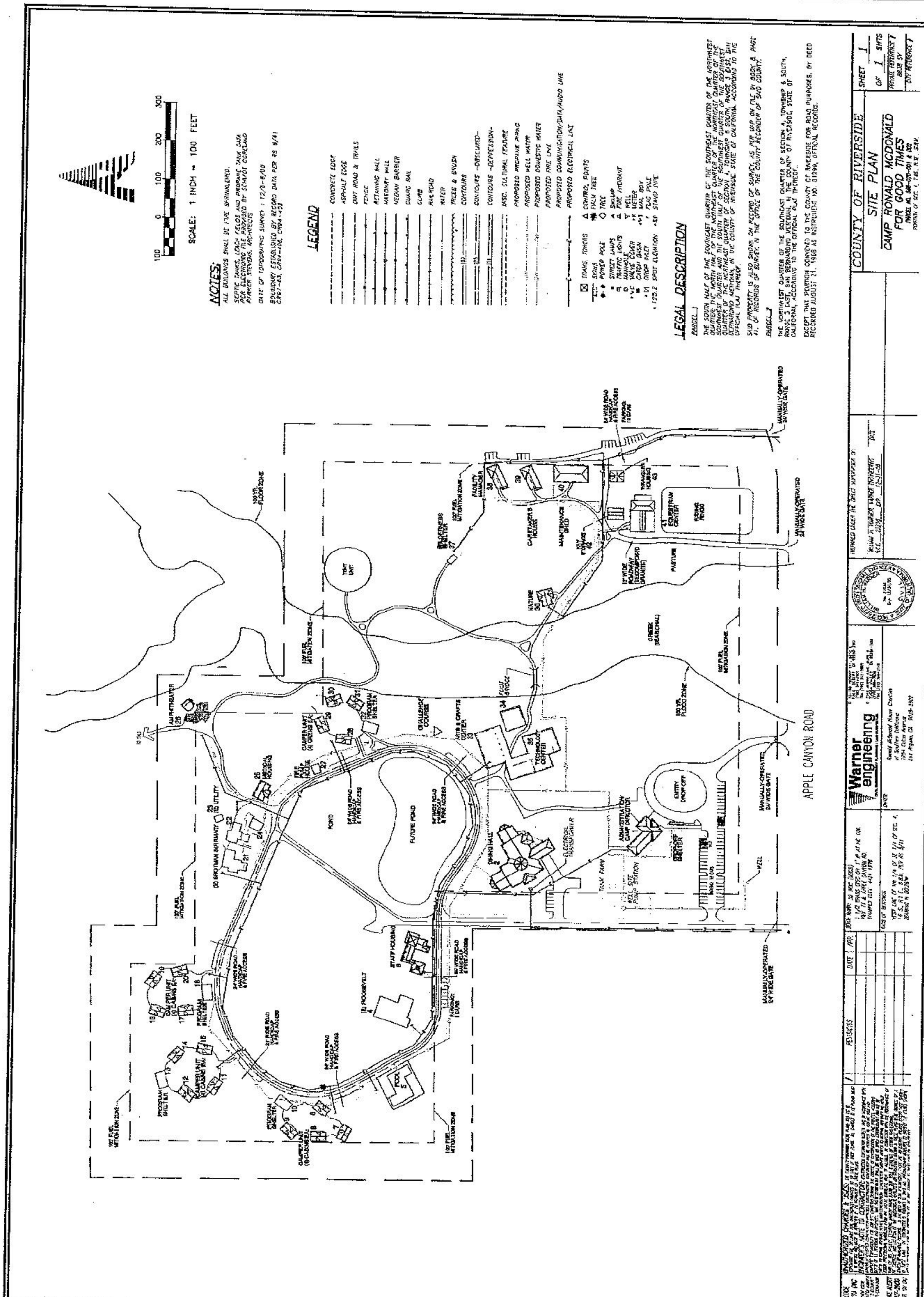


Figure 1: Proposed redevelopment of Camp Ronald McDonald for Good Times.

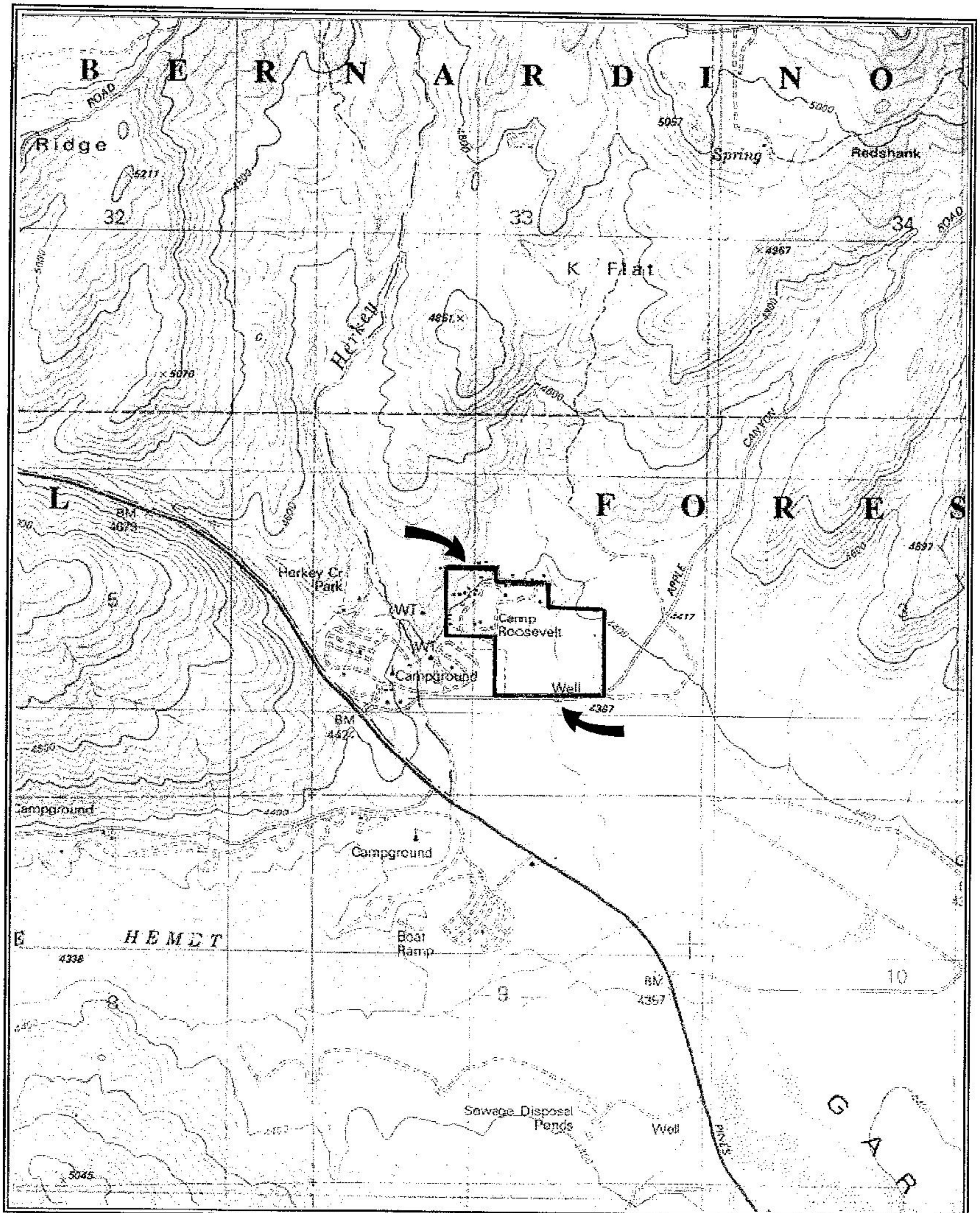


Figure 2: Location of Camp Ronald McDonald for Good Times near Mountain Center, central Riverside County. Adapted from USGS Idyllwild, California Topographic Map, 7.5'series (1999). Scale 1:24,000.

All cultural resources observed within the project boundaries were mapped, described, evaluated, and photographed during the field survey. Appropriate site records were submitted to the Eastern Information Center, University of California, Riverside, for assignment of a primary number designation.

ENVIRONMENTAL SETTING

Topography and Geology

The subject property lies approximately 2.5 miles southeast of the community of Mountain Center in central Riverside County. This is a topographically diverse region that is defined by Lake Hemet to the southwest, Keen Ridge to the northwest, Garner Valley to the southeast, and Apache Peak to the northeast (Fig. 3). The property is located in the San Jacinto Mountains, a portion of the Northern Peninsular Ranges of Southern California that is characterized by upland surfaces, prominent ridges and peaks, longitudinal valleys, basins, and steep-walled canyons. Drainage along this side of the mountain range generally flows in a southerly direction through a series of steep, stream-cut canyons toward Lake Hemet. For the most part, drainage in this region is intermittent, occurring only as the result of seasonal precipitation.

Topographically, the subject property includes few significant features. Located at the northern end of Garner Valley, it is primarily comprised of the relatively flat valley floor (Fig. 4). Increases in elevation occur near the northwestern property corner where the valley abuts the lower mountain slopes. Elevations range from a low of 4341.0 feet above mean sea level (AMSL) near the center of the southern boundary property boundary to a high of 4442.0 feet AMSL at the northwestern property corner. A USGS-designated blueline stream enters the property near the center of the southern 40 acres' northern boundary, and then bisects this parcel, exiting near the center of its southern boundary. Although vegetal evidence indicates the presence of some subsurface water, the watercourse primarily represents a seasonal source of water.

Geological formations within the Northern Peninsular Range province are generally comprised of a great mass of basement igneous rocks called the Southern California Batholith, with the primary rocks being granitic tonalite and diorite of Jurassic age. Within the boundaries of the subject property this is evidenced by small weathering granitic outcrops near the northwestern corner and scattered loose rocks of quartz and granitics found in varying densities throughout most of the property. Surface characteristics of

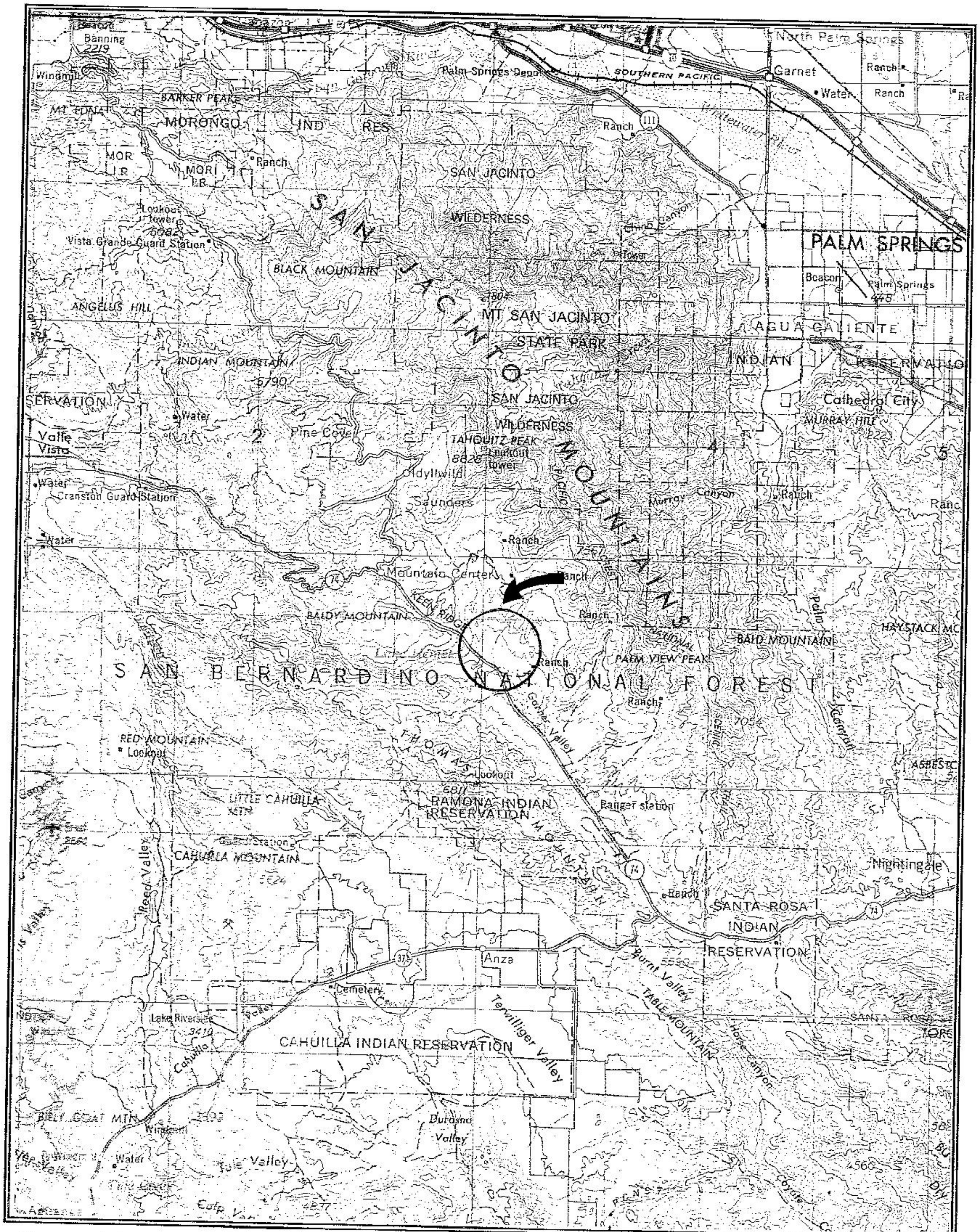


Figure 3: Location of Camp Ronald McDonald for Good Times in central Riverside County. Adapted from USGS Santa Ana, California Topographic Map (1959). Scale 1:250,000.

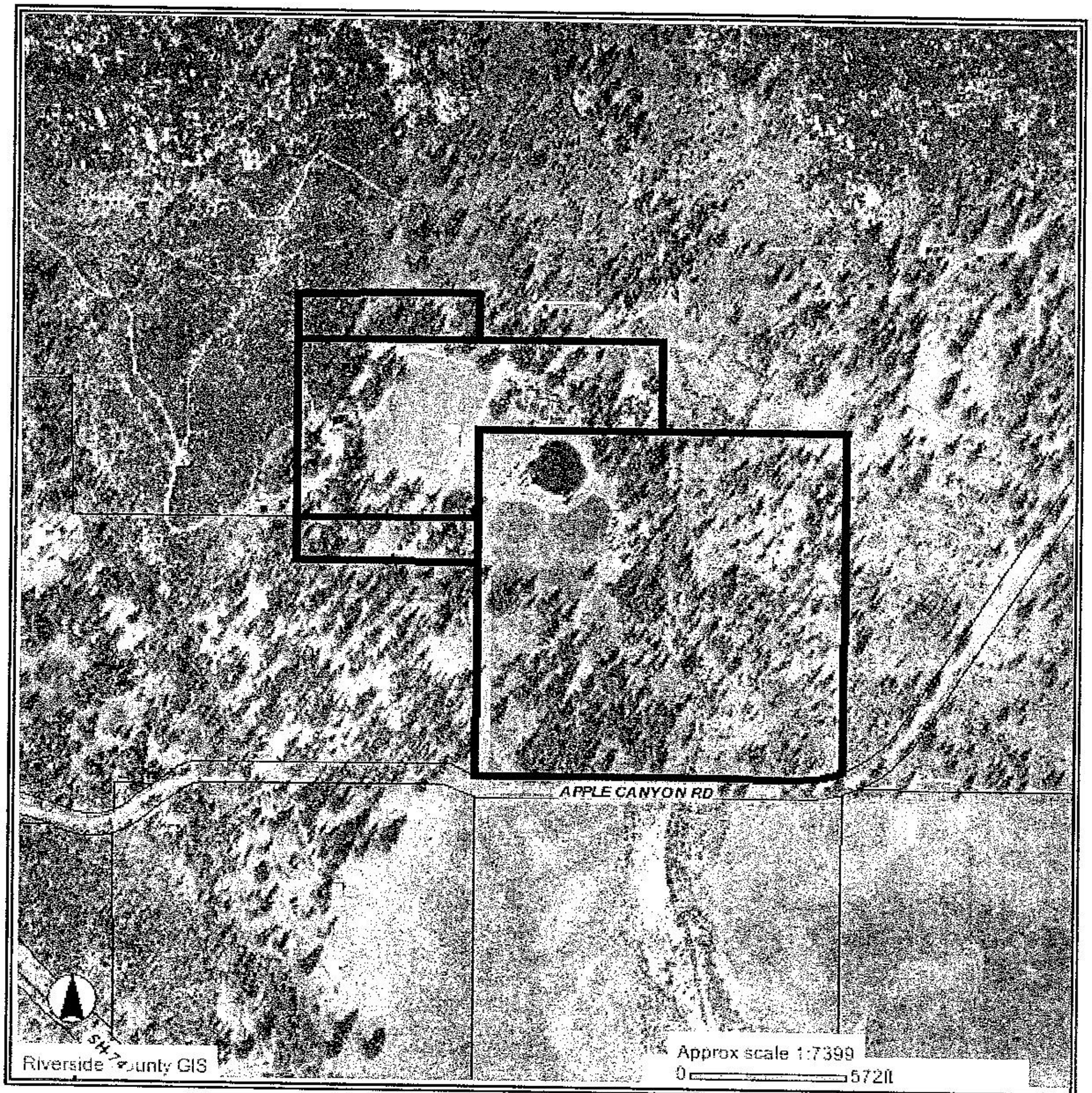


Figure 4: Aerial view of the subject property.

the exposed bedrock outcrops render them only marginally suitable for use in food processing or rock art by indigenous peoples of the region, and unsuitable for use as shelter. Much of the loose lithic material observed throughout the property would have been of suitable quality for implement production by Native Americans occupying the region.

Biology

Native vegetation growing within the boundaries of Camp Ronald McDonald appears to represent a transition area, perhaps due to the elevation and junction of certain topographical features. Three primary native plant communities are present: Chaparral (both red shank and chamise), Yellow Pine Forest, and Lower Riparian. Found on the mountain slopes in the northwestern portion of the property are representative plants of the Chaparral Plant Community, with red shank (*Adenostoma sparsifolium*) predominating. In a narrow strip along a portion of the northern property boundary the Chaparral Plant Community is also found, but with chamise (*Adenostoma fasciculatum*) as the dominant plant. Other plants present in both types of Chaparral include manzanita (*Arctostaphylos glandulosa*), five types of ceanothus (*Ceanothus greggii, C. megacarpus, C. spinosus, C. crassifolius, C. oliganthus*), California buckwheat (*Eriogonum fasciculatum*), California scrub oak (*Quercus agrifolia*), and Our Lord's Candle (*Yucca Whipplei*). Herbaceous associates include slender oat (*Avena barbata*), foxtail brome (*Bromus rubens*), twining brodiaea (*Brodiaea pulchella*), showy penstemon (*Penstemon spectabilis*), and phacelia (*Phacelia brachyloba*).

The predominant native plant community within the property boundaries, covering approximately half the land, is Yellow Pine Forest, often referred to as Jeffrey Pine Forest. Characteristic plant species include yellow pine (*Pinus ponderosa*), Jeffrey pine (*Pinus jeffreyi*), Coulter pine (*Pinus coulteri*), and sugar pine (*Pinus lambertiana*). Basin sagebrush (*Artemisia tridentate*), manzanita, chamise, and a variety of wildflowers comprise the understory.,

Finally, the watercourse bisecting the southern 40 acres of the property hosts the native Lower Riparian Plant Community, which is represented by a dense growth of willows (*Salix* spp.). In addition to these native plant communities, non-native grassland, interspersed with numerous introduced flowers, ornamentals, shrubs, is found throughout the entire central portion of the subject property.

During both the prehistoric and historical periods, an abundance of faunal species undoubtedly inhabited the study area. However, due to regional urbanization, the current faunal community is generally restricted to those species that can exist in proximity to humans, such as yellow pine chipmunk (*Tamias amoenus*), Californa mountain kingsnake (*Lampropeltis zonata*), Stellar's jay (*Cyancitta stelleri*), white-headed woodpecker (*Picoides albolarvatus*), northern alligator lizard (*Gerrhonotus coerruleus*), black-tailed jackrabbit (*Lepus californicus*), Audobon's cottontail (*Sylvilagus audobonii*), coyote (*Canis latrans*), and mule deer (*Odocoileous hemionus*).

Climate

The climate of the study area is that typical of cismontane Southern California, which on the whole is mild, sunny, warm, and rather dry. This climate is classified as Mediterranean or "summer-dry subtropical." Temperatures seldom fall below freezing or rise above 100 degrees Fahrenheit. The rather limited precipitation received occurs primarily during the winter and early spring months.

Discussion

The natural resources of the subject property offer a number of potential sources of subsistence utilized by indigenous peoples of the region. Local floral and faunal resources could provide food, as well as components for medicines, tools, and construction materials. Lithic material suitable for ground stone tools is relatively abundant, although that suitable for flaked stone tool production is somewhat limited. Bedrock outcrops suitable for use in food processing and rock art are only marginally available within the property boundaries and none were observed that could be used for shelter. This situation would typically necessitate either traveling elsewhere to perform these functions, or utilizing portable milling implements and constructing shelters. A permanent source of water appears to exist subsurface in the primary watercourse and significantly more water would be available on a seasonal basis. This continued availability of water would encourage establishment of long-term aboriginal habitation sites. There are, however, few of the defensive locations preferred by Native Americans of this region for the placement of such sites. It is probable that the most efficacious use of the subject property would be for seasonal resource exploitation

Criteria for occupation during the historical era were generally somewhat different than for aboriginal occupation since later populations did not depend solely on environmental conditions for survival. During the historical era the subject parcel would probably have been considered desirable due to land suitable for agriculture, a permanent source of water, as well as its proximity to a regional transportation corridor.

CULTURAL SETTING

Prehistory

On the basis of currently available archaeological research, occupation of southern California by human populations is believed to have begun at least 10,000 years ago. Theories proposing much earlier occupation, specifically during the Pleistocene Age, exist but at this time, archaeological evidence has not been fully substantiating. Therefore, for the purpose of this report, only human occupation within the last 10,000 years will be addressed.

A time frame of occupation may be determined on the basis of characteristic cultural resources. These comprise what are known as cultural traditions or complexes. It is through the presence or absence of time-sensitive artifacts at a particular site that the apparent time of occupation may be suggested.

In general, the earliest established cultural tradition in southern California is accepted to be the San Dieguito Tradition, first described by Malcolm Rogers in the 1920's. The San Dieguito people in general were nomadic large-game hunters whose tool assemblage included large domed scrapers, leaf-shaped knives and projectile points, stemmed projectile points, chipped stone crescentics, and hammerstones (Rogers 1939; Rogers 1966). The San Dieguito Tradition was further divided by Rogers (1966) into three phases: San Dieguito I is only found in the desert regions, while San Dieguito II and III occur on both sides of the Peninsular Ranges. Rogers felt that these phases formed a sequence in which increasing specialization and refinement of tool types were the key elements. Although absolute dates for the various phase changes have not been hypothesized or fully substantiated by a stratigraphic sequence, the San Dieguito Tradition as a whole is believed to have existed from approximately 7000 to 10,000 years ago (8000 to 5000 B.C.).

Throughout southwestern California, the La Jolla Complex followed the San Dieguito occupation. The La Jolla Complex, as first described by Rogers (1939, 1945), then redefined by Harding (1951), is recognized primarily by the presence of millingstone assemblages within shell middens. Characteristic cultural resources of the La Jolla complex include basined millingstones, unshaped manos, flaked stone tools, shell middens, and a few Pinto-like projectile points. Flexed inhumations, with heads pointing north, under stone cairns, are also present (Rogers 1939, 1945; Warren et al 1961).

The La Jolla Complex existed from 5500 to 1000 B.C. Although there are several hypotheses to account for the origins of this complex, it would appear that it was a cultural adaptation to climatic warming after circa 6000 B.C.. This warming may have stimulated movements to the coast of desert peoples, who then shared their millingstone technology with the older coastal groups (Moratto 1984). The La Jollan economy and tool assemblage seems to indicate such an infusion of coastal and desert traits instead of a total cultural displacement.

The Pauma Tradition, first identified by D. L. True in 1958, may be an inland variant of the La Jolla Complex, exhibiting a shift to a hunting and gathering economy, rather than one based on shellfish gathering. Implications of this shift are an increase in number and variety of stone tools and a decrease in the amount of shell (Meighan 1954; True 1958; Warren 1961; True 1977). At this time, it is not known whether the Pauma Complex represents the seasonal occupation of inland sites by La Jollan groups, or whether it represents a shift from a coastal to a non-coastal cultural adaptation by the same people.

The late prehistoric period in southwestern California, beginning approximately 2000 years ago, was a time of cultural transformations brought about by a variety of factors. One of the resultant developments was a shift toward land-based gathering instead of coastal shellfish gathering. At some time thereafter, acorn processing was introduced and because of this new subsistence focus, aboriginal land use patterns shifted to the interior upland regions and away from the previously favored coastal areas (True 1966:290).

The late period is represented by the San Luis Rey Complex, first identified by Meighan (1954) and later redefined by True et al (1974). Meighan divided this complex into two periods: San Luis Rey I (A.D. 1400 - 1750) and San Luis Rey II (A.D. 1750 - 1850). The San Luis Rey I type component includes cremations, bedrock mortars, millingstones, small triangular projectile points with concave bases, bone awls, stone pendants, *Olivella* shell beads, and quartz crystals. The San Luis Rey II assemblage is the same as San Luis Rey I, but with the addition of pottery vessels, cremations urns, tubular pipes, stone knives, steatite arrow straighteners, red and black pictographs, and such non-aboriginal items as metal knives and glass beads (Meighan 1954:233). Inferred San Luis Rey subsistence activities include hunting and gathering with an emphasis on acorn harvesting.

Ethnography

According to available ethnographic sources (Kroeber 1925, Strong 1929, Bean 1978), the study area was included in the known territory of the Cahuilla Indians during both prehistoric and historic times (Fig. 5). The origin of the name Cahuilla is uncertain, but it is believed that it may be from their own word "Kawiya," which means master or boss (Bean 1978). The language of the Cahuilla Indians belongs to the Cupan subgroup of the Takic family of the Uto-Aztecan stock. The Takic family of languages included those spoken by the majority of Native peoples living in Southern California, thus indicating that all of these peoples were closely related.

The territory of the Cahuilla was topographically diverse and covered a major portion of Southern California. Occupation included most of the area from the summit of the San Bernardino Mountains in the north, to Borrego Springs and the Chocolate Mountains in the south, a portion of the Colorado Desert west of Orocopia Mountain to the east, and the San Jacinto Plain and eastern slopes of Mount Palomar to the west. Their habitat included all environmental zones ranging from 273 feet below sea level at the Salton Sink, to 11,000 feet above sea level in the San Bernardino Mountains. Territorial boundaries of the Cahuilla were shared with the Serrano to the north, the Gabrieliño and Juaneño to the west, the Luiseño, Ipai, and Tipai to the southwest, and the Mojave to the east. A common tradition was shared by the Cahuilla, Gabrieliño, Serrano, and Luiseño, although the Gabrieliño and Serrano were most closely involved with the Cahuilla.

Beginning with William Duncan Strong (1929), a number of anthropologists have somewhat arbitrarily divided the Cahuilla into three territorial groupings: the Desert Cahuilla, the Mountain Cahuilla, and the Pass Cahuilla. The Desert Cahuilla were said to occupy the Lower Coachella Valley and the eastern canyons of the Santa Rosa Mountains. The Mountain Cahuilla primarily occupied the Anza Valley, the Santa Rosa Mountains, and Coyote Canyon as far south as the edge of the Borrego Valley. The Pass Cahuilla inhabited the San Gorgonio Pass, the Upper Coachella Valley, and the palm canyons on the eastern slope of the San Jacinto Mountains. Seasonally, both the Mountain and Pass Cahuilla occupied the higher elevations of the San Jacinto and Santa Rosa Mountains to escape from the heat as well as to hunt and collect food resources not

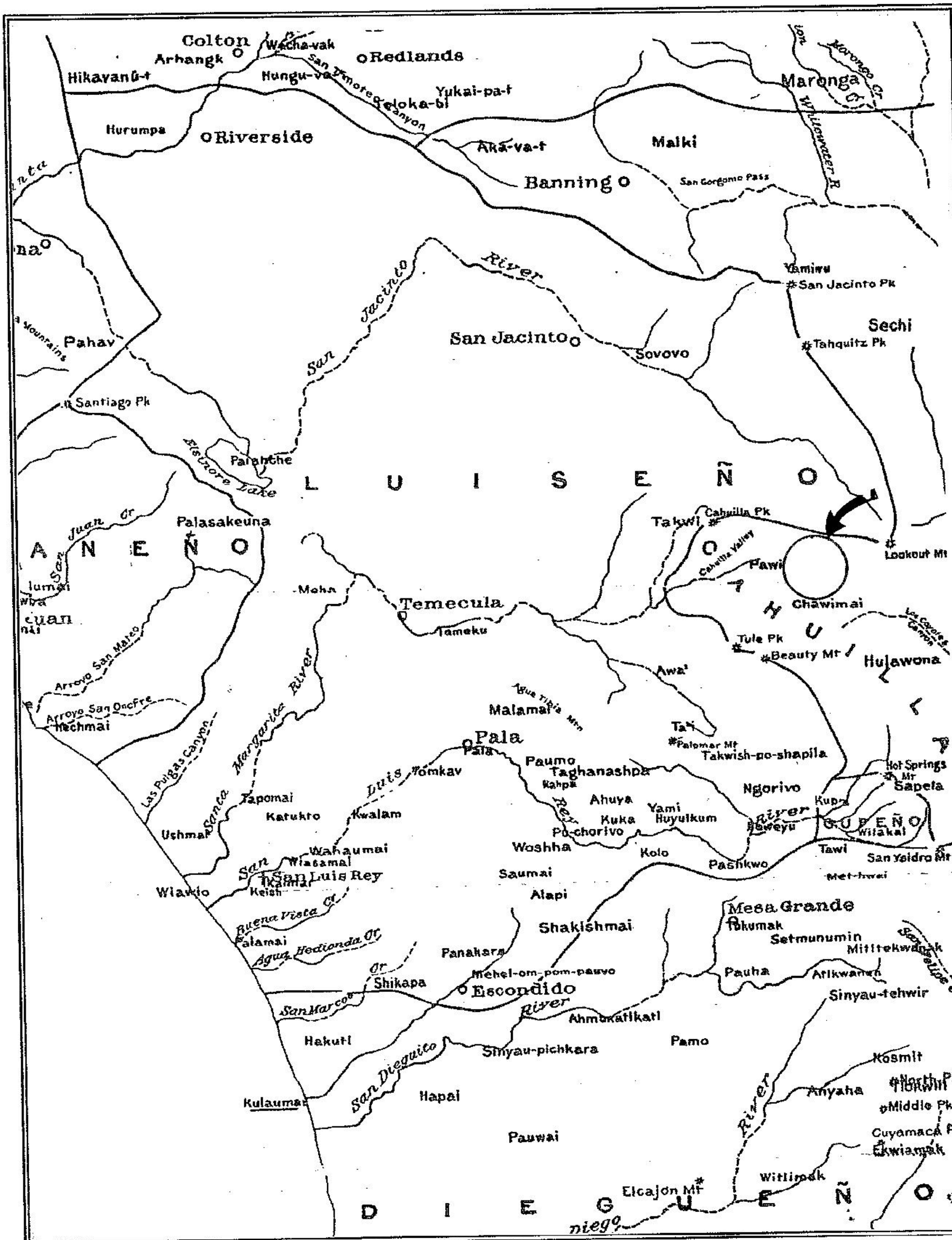


Figure 5: Ethnographic location of the Study Area. Adapted from Kroeber (1925).

available elsewhere.

Exactly when the Cahuilla first came to dwell in this area is not known. According to ancient legends, the original homeland of the Cahuilla was the desert. However, there was a forced migration to the Santa Rosa and San Jacinto Mountains, the result of a great flood that purportedly covered the entire Cahuilla Basin. Many of the earliest remembered names for family homes originate in these mountains (Strong 1929). As the flood waters receded, many of the Indian peoples followed, eventually returning to the desert environment. Cahuilla legend does not say exactly how long ago this flood occurred, but scientific evidence indicates that a large freshwater lake existed in this area around A.D. 900. The lake was formed by inflows from the Colorado River and remained until around A.D. 1200, when the lower course of the river changed, causing the water to flow not into the Cahuilla Basin, but directly into the Gulf of California. However, the lake apparently reformed a short while later and remained at the 42 foot contour until approximately A.D. 1500. This freshwater lake is referred to as the Blake Sea, or alternatively, Lake Cahuilla. It is presumed that the Cahuilla, returning from their mountain refuge, came to settle around this lake.

With its abundant natural resources, Lake Cahuilla provided adequate sustenance for the large population that eventually settled in the region. However, when the final desiccation of the lake occurred around A.D. 1500, the remaining resources could no longer support the entire population. This situation initiated a migration of many aboriginal inhabitants to the Colorado River Valley, as well as to the inland valleys of western and central Riverside County. It is known that there were peoples occupying these areas prior to the migration, although how long they were there has not been determined.

The settlement pattern of the Cahuilla occupying the study area was based on the establishment and occupation of sedentary and autonomous village groups. Villages were usually situated near adequate sources of food and water, in defensive locations, primarily on alluvial fans or in canyons. Buildings were situated in such a manner as to optimally utilize the water sources, as well as to insure privacy. Village structures typically included brush shelters, domed or rectangular houses 15-20 feet long, ceremonial houses, a communal men's sweathouse, and several granaries. The area immediately surrounding each village was held in common ownership by the lineage, while lands outside this area were divided into tracts and owned by individuals, clans, and families. Networks of trails interconnected the villages. Each village had specific resource procurement territories, most of which were within one day's travel of the village. However, during the autumn of every year members of Cahuilla villages would migrate to the mountain oak groves and camp for several weeks to harvest the acorn crop, hunt, and collect resources not usually available near the village.

Cahuilla subsistence technology was based on hunting and gathering. Game animals were shot with bow and arrow, trapped in snares, driven into nets, or chased until exhausted and then clubbed to death. The principle animals hunted included deer, rabbit, antelope, mountain sheep, quail, doves, ducks, and roadrunners. In the inland region, fish were caught in mountain streams. Hunting was done by adult, able-bodied men either individually or as a group; decoys were often utilized to facilitate an effective hunt. In preparing the food, men did the butchering and skinning, while women did the cooking. Typically, all portions of the animals were used for food – meat, bone, guts, and blood.

The collection of plant food resources occurred year-round, although during the winter months there was often a decrease in the available quantity. Acorns were the single most important source of food, with six varieties utilized. Also important were mesquite and screwbeans, piñon nuts, and the fleshy bulbs of various cacti. Supplementing the basic plant food resources were several types of grass seeds, wild fruits and berries, tubers, roots, and greens. Plant foods were typically prepared by pulverizing them in a stone mortar with a stone or wooden pestle, grinding them with a stone mano on a stone metate, cooking with a liquid in a basket or pottery vessel, baking in stone-lined ovens or pits, or preserving food by sun-drying.

The material technology of the Cahuilla included the production of baskets (flat, shallow, deep, globular), pottery (small-mouthed jars, cooking pots, open bowls, dishes, pipes), and stone implements (mortars, pestles, metates, manos, arrow straighteners). Bows were made of mesquite or willow, while the construction materials of arrows varied depending on what they were to be used for. Implements produced for use in ceremonies included charmstones, bullroarers, feathered headdresses, clappers, rattles, wands, and eagle feather skirts. Finally, clothing worn by the Cahuilla included sandals made of mescal fibers soaked in mud, baby diapers made of mesquite bark, skirts for women made of mesquite bark, skins, and tule, and hide loincloths for men.

The subsistence system of the Cahuilla, as described above, constitutes seasonal resource exploitation within their prescribed village-centered procurement territory. In essence, all activities of the Cahuilla were based on, and centered around, this seasonal resource procurement. During the spring, collection of roots, tubers, and greens was emphasized. Seed collection and processing during the summer months shifted this emphasis, although collection areas and personnel (primarily small groups of women) remained essentially unchanged. As autumn and the annual acorn harvest approached, the settlement pattern of the Cahuilla changed markedly. Small groups joined to form the larger groups necessary for the harvest and village members left the village for several weeks. Following the annual acorn harvest, village activities focused on the preparation of collected foods for use during the winter. Since few plant food resources were consistently available during the winter, this time was probably spent repairing and manufacturing tools and necessary implements in preparation for the coming resource procurement seasons.

The social structure of the Cahuilla was based on the existence of two main groups (moieties): the Wildcats and the Coyotes. Membership was determined by which group an individual's father was a member of. Members of the Wildcat moiety were said to have descended from one of the creator beings known as *Mukat,* while members of the Coyote moiety were descended from the other creator being, *Temayawut.* Marriages could only occur between members of opposite moieties. Each of the two moieties was further broken into a number of clans, membership in which was determined by which clan an individual's father had belonged to. Each clan had its own territory, the boundaries of which were often marked with petroglyphs. All of the natural resources within a clan's territory belonged to members of the clan, although some areas with especially abundant resources were shared by several clans.

Spiritual beliefs, ceremonies, and rituals played an integral part in Cahuilla life. Ceremonies were presided over by the *net* (the clan leader). Among the most important ceremonies and rituals were those held for marriage, death, and burial, as well as for adolescents' rites of passage. However, the most important of all ceremonies was the *nukil*, which was held every one to two years to honor clan members who had died since the last *nukil.* This ceremony lasted seven days and was attended by members of many clans. There were two primary purposes for the *nukil.* One was to help souls of the departed arrive safely in the afterlife and the second was to terminate the period of mourning for the deceased. Secondarily, the coming together of many clans provided opportunities for trade and for the arrangement of marriages. All marriages were arranged by parents and entailed the giving and receiving of gifts throughout the entire process, from initial negotiations to the marriage ceremony itself. Thus, Cahuilla marriages created important economic and social alliances between the clans (Bean 1978).

Based on the Cahuilla settlement and subsistence patterns, the types of archaeological sites associated with this culture may be expected to represent the various activities of seasonal resource procurement. Temporary campsites, usually evidenced by lithic debris and / or milling features, may occur with relative frequency. Food processing stations, often only single milling features, are perhaps the most abundant type of site found. Isolated artifacts, or fragments thereof, occur with approximately the same frequency as food processing stations. The most infrequently occurring archaeological site is the village site. Sites of this type are usually large, located in an area of abundant natural resources, and usually surrounded by sites of the type previously described, which reflect the daily activities of village members.

History

During the historical era, four principle periods of occupation existed in Southern California: the Explorer Period (A.D. 1540 – 1770), the Colonial Spanish-Mission Period (A.D. 1770-1830), the Mexican Ranch-Pastoral / Landless Indian period (A.D. 1830-1860), and the American Developmental / Indian Reservation Period (A.D.1860 – present).

In the general study area, the historical period is first represented by the Colonial Spanish-Mission Period. It was during this period that the Cahuilla are believed to have had their first actual contact with the Europeans, specifically, the Captain Pedro Fages expedition in early 1772 (Robinson 1993). Captain Fages, of the Catalonian Volunteers, was the military commander of Spanish California. Leading a small force of soldiers eastward from San Diego in search of deserters, his party reached the desert, turned northward into the Borrego Valley, ascended Coyote Canyon, and finally skirted the San Jacinto Mountains. Two years later, the first of two expeditions led by Juan Bautista de Anza crossed the San Jacinto Mountains. The purpose of Anza's first expedition (1774) was to find an overland route to Alta California from the Presidio of Tubac, near what is now Tucson, Arizona. His second expedition (1775-1776), following the now established overland route, was to bring a colonization party of 240 to the San Francisco Bay, where

Spain's most northern outpost was to be established. Although it was hoped that the opening of Anza's overland trail would facilitate colonization, the 1871 Yuma Massacre by the Quechan Indians of the Colorado River forced the Spanish to alter their mode of travel from land to sea. As a result, Anza's overland trail was permanently closed and the Cahuilla within the study area had few opportunities for direct contact with the Europeans.

In 1819 the first *asistencias* were established near Cahuilla territory. Subsequently, many Cahuilla were to interact more frequently with the Spaniards and as a matter of course, came to adopt certain aspects of Spanish culture, such as cattle, clothing, agriculture, and language. The Spanish *asistencia* closest to the study area was the Rancho San Jacinto, which was founded at some time between 1816 and 1821. This large mission ranch provided abundant cattle and horses for the thriving Spanish Mission San Luis Rey.

During the Mexican Ranch-Pastoral / Landless Indian Period the first of the Mexican ranchos was established. Throughout this period, the Cahuilla essentially maintained their political and economic autonomy. In the Coachella Valley area, the Cahuilla's political strength increased by confederating several clans or remnants of former clans under one leader by the 1840's. In 1846, Juan Antonio, who was one of the most important leaders of the Cahuilla, moved several Cahuilla clans to the vicinity of Riverside (Jurupa) where the village of *Pulatana* was established. Later, their village was moved to San Timoteo near El Casco. It is thought that these clans were moved to the second location by Mexicans to guard against the Colorado River Indians and other raiding tribes. In 1847 a battle took place between the Cahuilla under Juan Antonio and the Luiseño under Manuelito Cota and Pablo Apis at Aguanga. This battle resulted in a major defeat of the Luiseño and is referred to as the "massacre" at Aguanga (Strong 1972). At this time, the Cahuilla were acting as Mexican allies and the Luiseño had allied with the Americans. Despite this defeat, Mexican California came to an end with the American conquest of 1846-1847 and the signing of the Treaty of Guadalupe Hidalgo on February 2, 1848.

With the beginning of the American Developmental / Indian Reservation Period, the Cahuilla still outnumbered Euroamericans and were clearly in control of the region. Unfortunately, the Cahuilla's situation soon changed significantly. A smallpox epidemic in 1863 almost decimated the Cahuilla population, leaving them relatively defenseless against the ever-increasing influx of Americans into the region. Estimations of the population size for the original Cahuilla population have ranged from 3600 to 10,000 individuals, with the higher number being supported by government census figures in the 1850's. Following the smallpox epidemic, the Cahuilla population was reduced dramatically, with only about 1000 individuals remaining by 1865 (Bean 1978).

From this time until the first reservations were established in 1875 and federal enforcement became more stringent in 1891, most Cahuilla remained on their own lands practicing traditional lifeways. After 1891, their lives were closely supervised by the federal government and they were restricted to the various Indian reservations established in the region. The Agua Caliente Reservation, which is located three miles northeast of Camp Ronald McDonald, encompasses 31,128 acres of land and was one of the last of ten Cahuilla reservations, having been established in 1891.

It was also during this period of history that the San Jacinto Mountains began to receive far more attention from the Americans than they ever did from either the Spaniards or Mexicans. At some time between 1861 and 1867, Charles Thomas, a cattle rancher and flour mill operator from Temecula first entered a mountain basin nestled on the southwestern flank of the San Jacinto Mountains. This basin became known as Hemet Valley, then Thomas Valley, and finally, as it is known today, Garner Valley. It is at the northern end of this valley that the subject property is located.

An orphaned native of New York, Charles Thomas came to California in 1849 by way of a sailing ship, arriving in San Francisco when he was barely 14 years old. For the next ten years he traveled and worked up and down the coast, finally settling in Los Angeles County, where he farmed and traded stock. In 1860 Thomas and Augustus Knight filed a mining claim in the Temescal Tin Mining District, then sold their claim one year later to Abel Stearns for $600.00 (Gunther 1984).

On May 14, 1861, Thomas married Genoveva Bardico, a member of a prominent Santa Barbara family who had come from Spain. Shortly thereafter, Thomas moved with his wife and 200 head of cattle to Temecula, where he operated a cattle ranch and flour mill, as well as began raising a family. There would eventually be twelve children born to Charles and Genoveva, nine of which survived until adulthood. Apparently, because he was friendly with Indians living in the area, Thomas was told about and later taken to, a large meadow in the San Jacinto Mountains where the Mountain Cahuilla had a village. According to the prevailing story, the Indians offered Thomas the right to settle in the valley in exchange for cattle – 200 head, according to Victoria Brooke Thomas, a daughter born in 1867 to Charles and Genoveva. Although Thomas acquired the right to settle in the valley from the Indians, this did not constitute legal title under federal law so he later acquired the valley land legally through various means including homesteading, purchases from the United States General Land Office, and from the State of California.

The original size of the Thomas Ranch was 480 acres, although at one time it had expanded to over 8000 acres. The first ranch house was a crude log cabin built on the northwestern edge of the valley near where the Garner Ranch house stands today. During those early days Thomas' family remained at the Temecula ranch with Thomas making periodic trips to the mountain ranch to oversee his cattle herds, as well as to construct more substantial corrals and ranch buildings. In 1872 or 1873, after building a road up from the Anza Valley and constructing a spacious ranch house with associated buildings, Thomas finally moved his family to the mountain valley ranch from Temecula.

The Thomas Ranch soon became an important ranch in Southern California partly because of its eventual size and partly because of the type of stock maintained there. It is reported that Thomas imported from Kentucky the first thoroughbred stock ever brought to California and that his cattle consistently took first place at different State fairs (Gunther 1984). By the 1880's thousands of head of cattle roamed Thomas Valley, as it was then called. During this period Helen Hunt Jackson stayed at the ranch for a period of time while she studied the plight of California Indians. According to Victoria Brooke Thomas, Ramona Lubo and her husband Juan Diego, both immortalized in Jackson's *Ramona*, worked on the Thomas Ranch. Another employee, a wood cutter named Herkey (or Hurkey), was also immortalized by being one of the few humans ever attacked by a grizzly bear. According to the story, Herkey's dog chased tow grizzly bear cubs up a tree and their enraged mother charged Herkey as he was drinking from a creek. Despite being severely mauled, Herkey managed to get back to the ranch house where he died a few days later. Herkey Creek, which runs just to the west of Camp Ronald McDonald, marks the spot where the attack occurred.

In 1898, after living at Thomas Ranch for over thirty years and with all the children gone, Charles and Genoveva sold the 2100 acres of their mountain ranch top a wealthy Englishman named Harold Kenworthy. However, after losing most of his fortune in a mining venture, Kenworthy deeded the ranch back to the Thomases in 1900. Then on

December 28, 1905, the ranch, by then encompassing only 1700 acres, was sold for $30,000.00 to a stockman from San Bernardino named Robert F. Garner. Robert Garner permitted the Thomas family a period of one year to sell off their stock and vacate the ranch. The Thomas family moved to Redlands, where Charles operated a livery stable for four years. Charles Thomas died on March 31, 1917 at the home of one of his daughters in Ocean Park; Genoveva died in 1925.

On January 1, 1907 Robert Franklin Garner took possession of what was then Garner Ranch. Garner proceeded to build his ranch into one of the largest and most profitable stock farms in Southern California, grazing over 1500 head of cattle within only a few years. To expand his grazing land Garner bought adjacent land and leased, then bought, the 5000-acre Hancock Johnston Ranch between Herkey Creek and Keen Camp. This purchase increased the size of Garner Ranch to 9500 acres. Despite the immense size of the ranch, it was not until around 1947 that the valley containing the ranch was referred to as Garner Valley instead of Thomas Valley.

The decline of the Garner Ranch as a cattle ranch began in the late 1960's when it became more profitable to subdivide land for housing tract development than for running cattle. In 1968, 2500 acres of Garner Ranch were sold for subdivision development, in 1974 an additional 2000 acres were sold, and by 1991, the U.S. Forest Service had bought or traded for 2500 acres of the Garner Ranch. The current Garner Ranch, centered around the old Thomas house in the upper valley, includes 2500 acres of land and is still owned by the Garner family.

METHODS AND PROCEDURES

Research

Prior to commencement of the Phase I Cultural Resources Assessment field survey a records search was conducted by staff at the California Archaeological Inventory and California Historical Resources Information System, Eastern Information Center, University of California, Riverside. The research included a review of all site maps, site records, survey reports, and mitigation reports relevant to the study area. The following documents were also reviewed: The National Register of Historic Places, Office of Historic Preservation Archaeological Determinations of Eligibility, and the Office of Historic Preservation Directory of Properties in the Historic Property Data File. In addition to the records search, a request for a Sacred Lands File search was submitted to the Native American Heritage Commission and project scoping letters were sent to nine tribal representatives listed as being interested in project development in the Mountain Center/Idyllwild area.

Subsequent to the records and Sacred Lands File searches, a literature search of available published references to the study area was undertaken. Reference material included all available photographs, maps, books, journals, historical newspapers, registers, and directories at the Riverside Public Library Local History Collection and the University of California, Riverside libraries. Cartographic Research was conducted at the Science Library Map Collection of the University of California, Riverside. The following maps were consulted:

1901 San Jacinto, California (30', 1:125,000) USGS Topographic Map
1959 Idyllwild, California (15', 1:62,500) USGS Topographic Map
1959 Santa Ana, California (1:250,000) USGS Topographic Map
1981 Idyllwild, California (7.5', 1:24,000) USGS Topographic Map
1988 (photorevised) Idyllwild, California (7.5', 1:24,000) USGS Topographic Map
1999 Idyllwild, California (7.5', 1:24,000) USGS Topographic Map

Archival and informant research was conducted in attempt to obtain information specific to the age and origin of Camp Roosevelt and past land uses of the subject property. Most of this research was conducted in conjunction with the 1994 Phase I

Cultural Resources Assessment of the subject property, but because several of the informants did not respond until after that report was written and submitted, the information obtained was not included in the original report. Resource agencies included the following: County of Riverside Recorder's Office, the County of Riverside Assessor's Office, County of Riverside Transportation Department, County of Riverside Building & Safety Department, US Forest Service, Orange Coast Title, and the Bureau of Land Management. Informants included Brian Crater (Director, Camp Ronald McDonald for Good Times), Diana Seider (Riverside County Historian in 1994), Keith Herron (current Riverside County Historian), James McGoldrick (longtime area resident), Marilyn Lazofsky (US Forest Service Archaeologist), Daniel McCarthy (US Forest Service Archaeologist), and Mike Miller (US Forest Service appraiser). Attempts to contact Mr. Ernie Maxwell, a local expert on the San Jacinto Mountains, proved futile in 1994 and Mr. Maxwell has since passed away.

Fieldwork

Following the literature, archival, informant, and cartographic research, Jean Keller conducted a comprehensive on-foot field survey of the subject property on April 29, 2008. The survey was accomplished by first walking the perimeter of the subject property in order to verify current project boundaries, then by traversing the property, beginning at the southwestern property corner, in parallel transects at 15-meter intervals. The survey proceeded in a generally south-north, north-south direction following the existing contours of the land. All portions of the subject property were accessible for survey except those covered by buildings, structures, landscaping, and vehicles. With few exceptions, ground surface visibility was excellent, averaging approximately 75% throughout the property.

Since a current topographic map provided by the project engineers clearly delineates all buildings, structures, roads, and features within Camp Ronald McDonald, it was not necessary to map their locations, only to compare them to those on the map. During the field survey, all cultural resources observed within the project boundaries were photo-documented from different vantages, described, and evaluated architecturally for both age and integrity. Areas in which a granitic outcrop with a 'scary face' painted in blue and a rectangular rock formation had been recorded during the 1994 Phase I field survey were intensively scrutinized for evidence of the features. Appropriate site records were submitted to the Eastern Information Center, University of California, Riverside for assignment of a primary number for the former Camp Roosevelt site.

RESULTS

Records Search

Results of the records search conducted by staff at the Eastern Information Center indicated that portions of the subject property had been included in three previous cultural resources studies. The first study, conducted in 1964 by Marilyn Mlazovsky of the San Jacinto Ranger District, included 10 acres of San Bernardino National Forest land upon which Camp Roosevelt developments and improvements had trespassed and which, under the Small Tracts Act, the U.S. Forest Service wanted to exchange for land of equal value. The Short Form report, entitled "Camp Roosevelt AKA Camp Mesorah Land Exchange," included land located within APN 568-070-013 and 024. A 100% cultural resource survey revealed no historic or prehistoric cultural remains on the ground surface and no subsurface excavation was included in this study. The second study, conducted in 1980 by Steve Hammond of the California Department of Transportation, encompassed only an existing dirt road 15 feet wide and approximately 700 feet long that provided access from SH-74 to the California Conservation Camp which at the time was located on the Camp Roosevelt property. Hammond conducted the field survey in conjunction with maintenance grading of the road and found no recorded archaeological resources within or immediately adjacent to the APEI for the proposed project.

The third study, conducted by this firm in 1994, is entitled "A Phase I Cultural Resources Assessment of Camp Ronald McDonald for Good Times, 55.0 acres of land near Idyllwild, Riverside County, California." This Phase I study included all portions of the current project area with the exception of the acreage addressed in the referenced 1964 U.S. Forest Service study. Reported cultural resources included several buildings within the northern 15 acres of the subject property that comprised a portion of Camp Mesorah, formerly known as Camp Roosevelt, as well as a granitic boulder with a 'scary face' painted with oil-based blue paint. Despite extensive research, a specific date of construction (1952) could only be found for three of the former Camp Roosevelt buildings and they were not located within the project boundaries, but instead, on San Bernardino National Forest land. Since the remaining structures of Camp Roosevelt were built between 1952 and 1994, it was determined possible that some could be of historical origin. However, since the buildings' historicity could not be verified and since substantial alterations had been made to the buildings, no restrictions or preservation mitigation beyond the recordation in the report was recommended. In the southern 40 acres of the property a rectangular formation comprised of +45 rocks was recorded on the western bank of the watercourse that bisects this parcel of land. Based on the dimensions, placement, and condition of the feature it was deemed possible that it represented a grave, although not of Native American origin. Since the origin and function of the rock formation could not be discerned, it was recommend that it should either be preserved through avoidance or that a limited Phase II Investigation be conducted to determine the site's significance.

The subject property is located within a well-studied area with fifteen cultural resources studies having been conducted within a one-mile radius. During the course of field surveys conducted for these studies, sixteen archaeological sites of prehistoric (Native American) origin (CA-RIV-1915, 1916, 7698 thru 7709, 8089, 8203), and three sites of historical origin (CA-RIV-298H, 299H, 8096H). Cultural resources reported at the prehistoric sites are predominantly bedrock milling slicks and mortars, although thermal rock features, midden deposits, ceramics, portable milling implements, flaked stone tools, and debitage are also present. Cultural resources of historical origin are primarily structures and equipment associated with ranching activities occurring in the study area during the late 19th and early 20th centuries. What is now the Herkey Creek Campground (CA-RIV-298H) is reportedly the location where Mr. Herkey, a local woodcutter, was attacked by a mother grizzly bear. While many historical structures and features were reported at this multi-locus site, there are also numerous Native American cultural resources, including bedrock milling slicks and mortars, a possible burial, and two projectile points. In addition to the historic buildings, ranching equipment, grave, and trash dump recorded at the Thomas Ranch/ Garner Ranch (CA-RIV-299H), at least eight bedrock boulders with a minimum of 18 milling slicks , 15 mortars, and 5 basin metates are present, as well as manos, burnt bone, and pottery sherds.

The Sacred Lands File search indicated the presence of Native American cultural resources in the immediate project area. One project scoping letter response has been received thus far from the nine tribal representatives listed as being interested in developments in the Mountain Center/Idyllwild area. Mr. Richard Begay, Director of the Historic Preservation Office of the Agua Caliente Band of Cahuilla Indians, completed a records check of their cultural register and found no recorded cultural resources within the project area. Therefore, the Agua Caliente Band of Cahuilla Indians has no further concerns regarding the proposed project,

The literature search offered no information specific to the subject property. With the exception of a brief mention of Camp Roosevelt in a April 17, 1970 *Riverside Daily Enterprise* article and a July 18, 1969 article in the *Idyllwild Town Crier*, no published information regarding Camp Roosevelt could be found. Cartographic research yielded information regarding the property's land use history from 1898 through 1996. Available cartographic evidence shows that in 1898 (year of survey for the 1901 USGS San Jacinto topographic map) no structures or improvements were located within the property boundaries, inferring that it was vacant. Camp Roosevelt first appears on the 1959 USGS Idyllwild, California 15' topographic map as a collection of 18 buildings (Fig. 6). Since cartographic sources for the period between 1901 and 1955 (date of aerial photography for the 1959 map) are not available, it is not possible to more precisely determine when the camp was established. By 1981, the USGS Idyllwild, California 7.5' topographic map shows 23 buildings in the vicinity of Camp Roosevelt, but not all of the buildings are within the boundaries of the subject property or necessarily part of Camp Roosevelt (Fig. 7). The configuration of these buildings remained unchanged on the 1988 version of the 1981 map (photorevised, 1985 aerial photography) and on the 1999 Idyllwild 7.5' topographic map. Interestingly, the Camp Roosevelt building configuration shown on the 1959 map does not match those on the 1981/1988/1999 maps or what currently exists on the property. Two hand-drawn maps further complicate the issue. A site map for the Schole Ranch School, which occupied the Camp Roosevelt property from 1972 to 1975, shows a different building configuration than either the 1959 or 1981 maps, although certain buildings in the southwestern portion of the subject property remain relatively constant (Fig. 8). Finally, the Special Use Permit map submitted to the U.S. Forest Service in 1975 after the school vacated the property, has yet a different

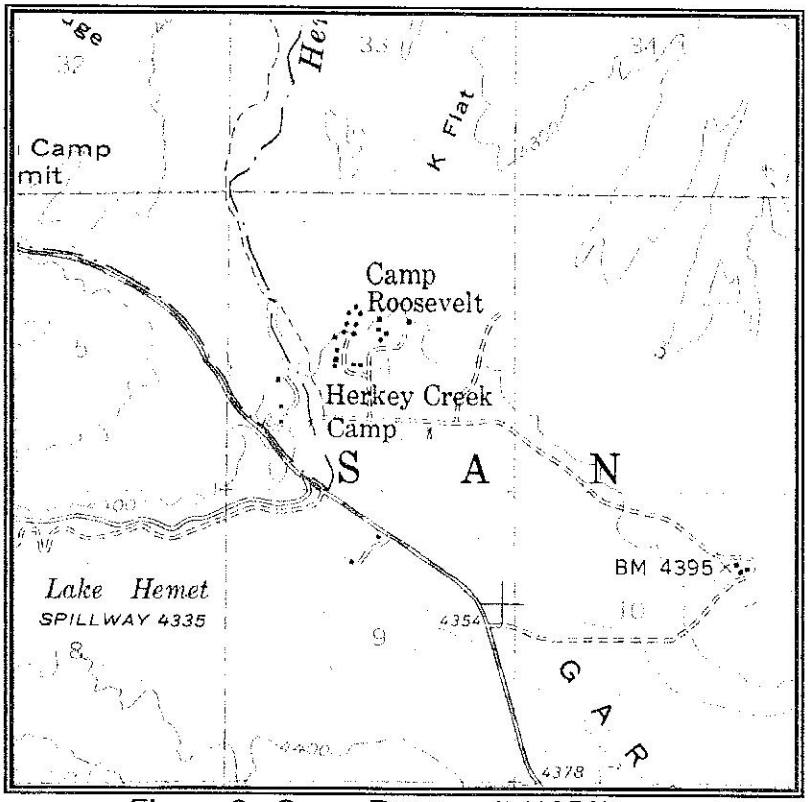


Figure 6: Camp Roosevelt (1959).

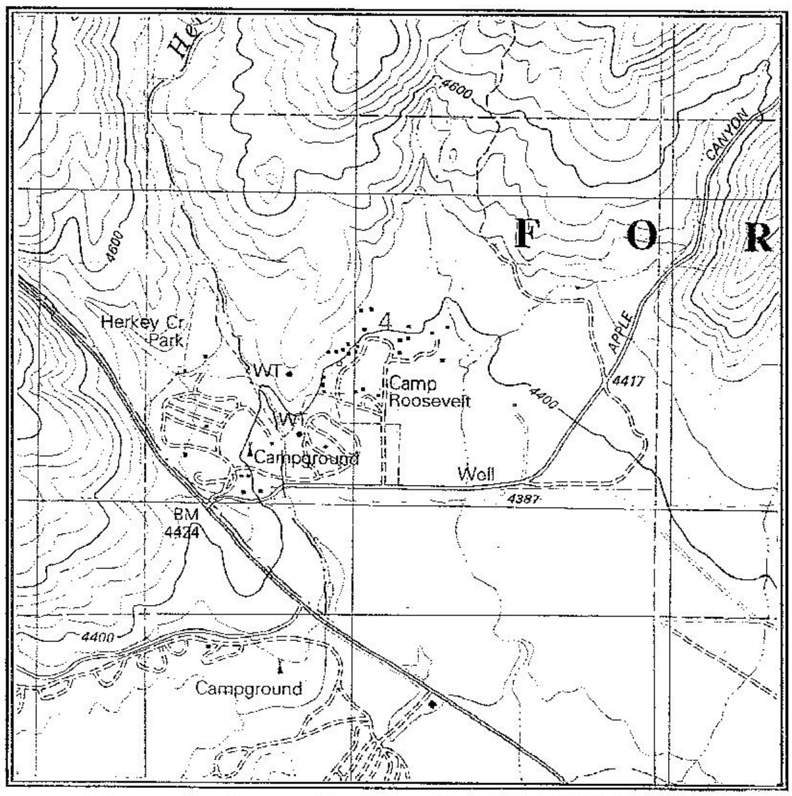


Figure 7: Camp Roosevelt (1981/1988/1999).

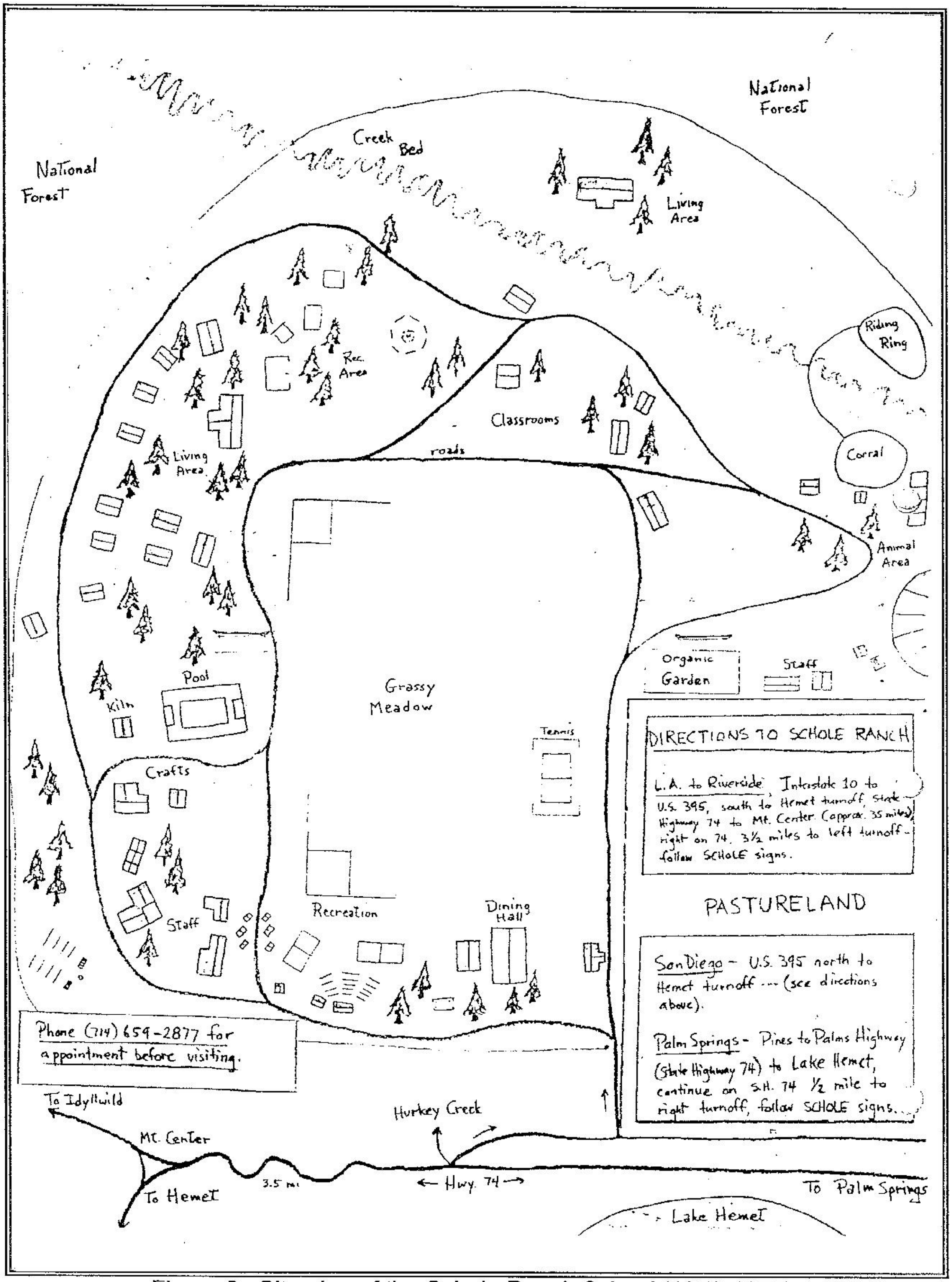


Figure 8: Site plan of the Schole Ranch School (1972-1975).

building layout and may reflect removal of some buildings when the school vacated the property (Fig. 9).

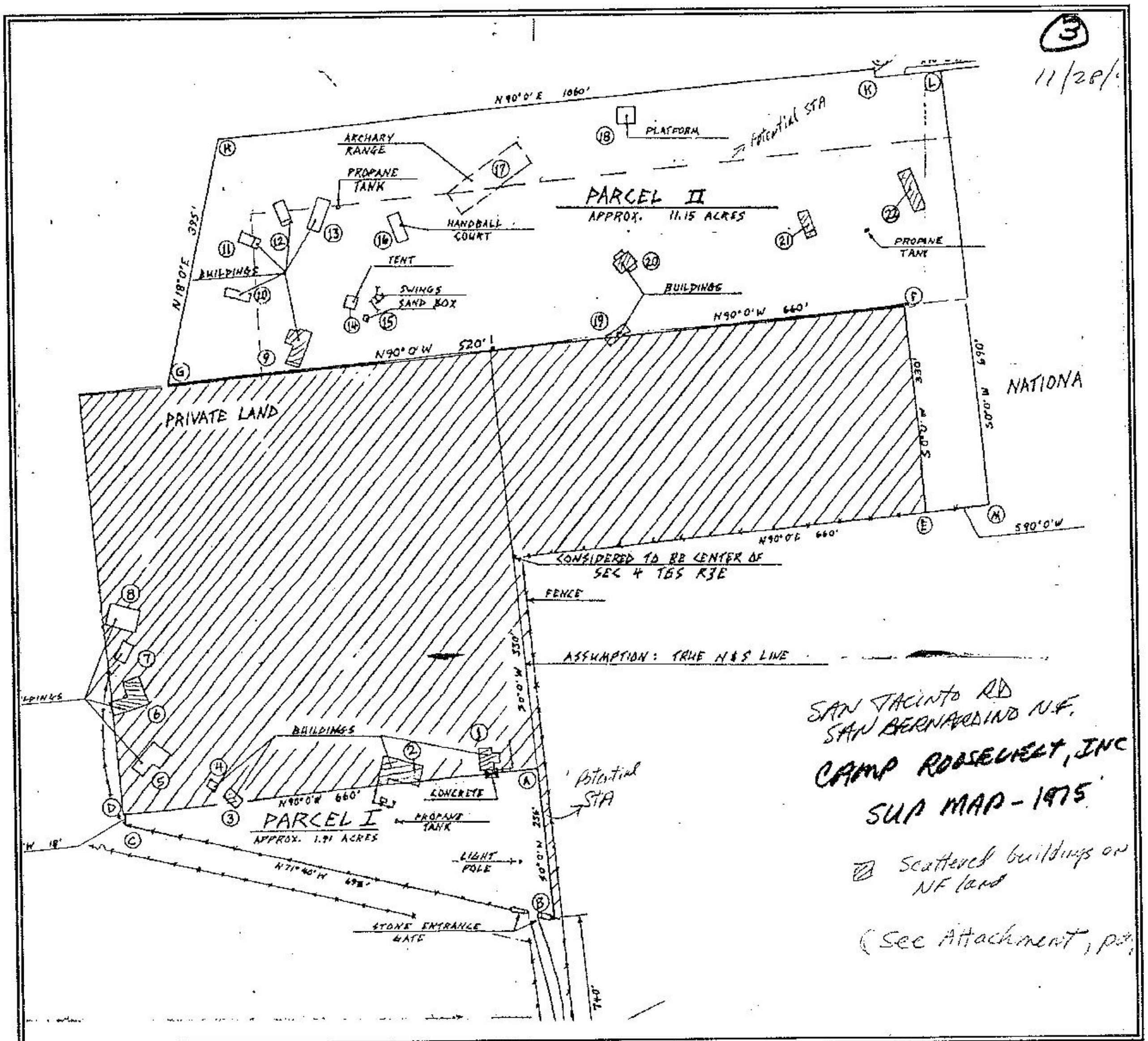


Figure 9: Special Use Permit Map submitted to the U.S. Forest Service in 1975.

While resembling the building configurations evidenced in all cartographic sources, the existing buildings within Camp Ronald McDonald offer another perspective of land use activities on the former Camp Roosevelt property, reflecting their dynamic nature (Fig. 10). Existing cartographic evidence indicates that over the past 50 years buildings were constructed, moved, altered, and demolished according to the needs of various occupants and as such, determining the historicity of any building is problematic.

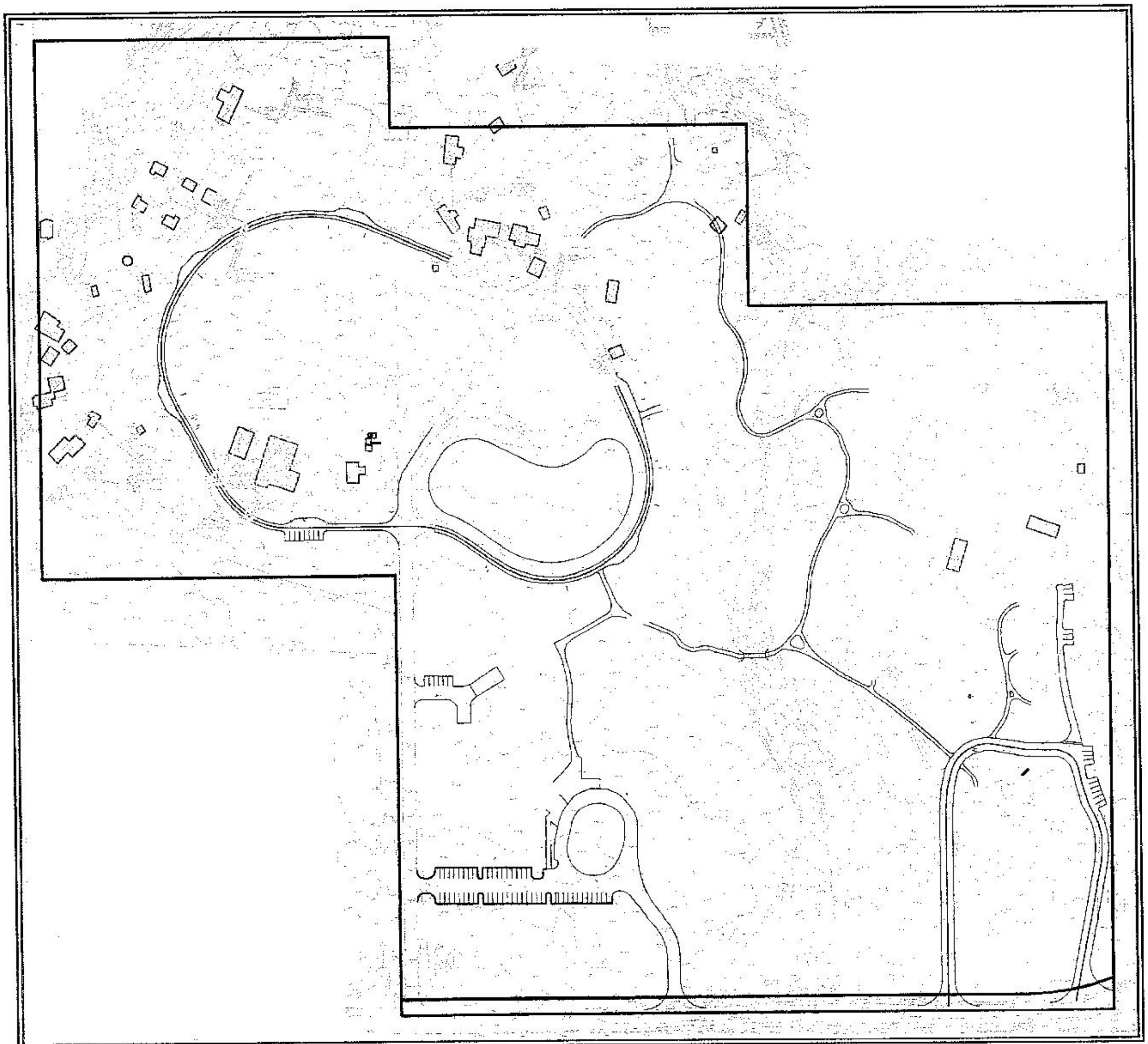


Figure 10: Existing buildings and structures within Camp Ronald McDonald.

Archival research provided the most complete information regarding the subject property and former Camp Roosevelt, although this information was still relatively minimal. The County of Riverside Building and Safety Department only maintains permit information as far back as 1963 so it was not possible to determine an accurate date of construction for the potentially historical buildings of Camp Roosevelt. County of Riverside Planning Department records indicate that a number of previous land use applications had been made for land within the proposed project boundaries, but the earliest of these was to convert existing Camp Roosevelt to the private Schole Ranch School in 1972 (PUP 568). In addition, although there were no dates of construction mentioned, a list of 16 buildings comprising Camp Roosevelt is on file at the Planning Department.

The most comprehensive information available regarding the subject property and historical Camp Roosevelt exists in the Special Permit files maintained by the U.S. Forest Service. The original Special Use Permit, issued on February 26, 1952 to Camp Roosevelt, Inc. by the U.S. Forest Service, was for a residence and 2 ½ bunkhouses on 10 acres of San Bernardino National Forest land. The permit was a resolution to an encroachment problem that arose when a boundary survey discovered the buildings and other improvements on federal land. Instead of the government taking a trespass action for the removal of the buildings, it issued a Special Use Permit with a caveat that the private land use was not a long term condition. The file does not contain information regarding the actual construction date of the residence and bunkhouses, only when they were discovered. These buildings are currently located near the southwestern corner of Camp Ronald McDonald. On January 1, 1956 the permit was revised to increase the size of Camp Roosevelt by an additional 20 acres, but no mention was made of adding more buildings. Permission would seemingly be unlikely considering the fact that additional buildings would be encroaching on federal land and expanding the private use would contraindicate the 1952 edict that the private use was not to be long term. Yet by 1959 two additional buildings appear within the forest land (now the office and dining hall) and an additional 13 buildings are located on 15 acres of private land to the north, for a total of 18 original, and thus historical, Camp Roosevelt buildings.

From 1952 until early 1972, Camp Roosevelt was run by its founder, Mr. Dan Slater, as an organizational camp for Jewish young people. On November 25, 1968, Camp Roosevelt, Inc. entered into an agreement to sell the northern 15 acres of the camp to folksinger Glenn Yarborough for development of a private school. In addition to the real property, the sales agreement included "approximately 7 children's dormitories and 1 Director's residence, and other improvements (all of which are herein referred to as the "permit improvements" located on certain real property hereinafter more particularly described and referred to as the "permit property"" (Pilgrim Schole Sales Agreement, .November 25, 1968). In other words, Camp Roosevelt, Inc. intended to sell the private property portion of the camp as well as building and improvements on the Special Use Permit federal land to Yarborough. The sale did not close until March

2, 1972, at which time the Schole Ranch School took possession of the former Camp Roosevelt. The U.S. Forest Service transferred the Special Use Permit to the Pilgrim Schole Foundation, re-classified the property as an Educational Center, and decreased the SUP acreage from 30 acres to 13.06 acres since that is what they deemed was actually necessary to support the operation.

According to a school brochure, Yarborough had "long dreamed of a school where children would have the opportunity to learn in an atmosphere of love and freedom" (Schole – a Ranch School for Ecology brochure, 1971). After purchasing Camp Roosevelt, Yarborough formed the Pilgrim Schole Foundation in order to establish the residential, "non-profit school for those seeking an alternative educational experience with a focus on developing their natural interest in environment and relationships with their fellow man" (*Ibid*). The school was named the Schole Ranch School, with the name Schole being an anagram for **S**chool for **C**hildren of **H**appiness **O**pportunity **L**ove and **E**ducation. Tuition for the nine-month school year was $2400.00 and as was illustrated in Figure 8, the school offered many amenities such as an organic garden, horseback riding, crafts, a pool, kiln, a large grassy meadow. Apparently, the school was not as well received as Yarborough had dreamed and during the early part of 1975, the Pilgrim Schole Foundation defaulted on the sale, with Dan Slater retaining title to the property.

On May 22, 1975 Slater was issued a Special Use Permit for an organizational camp, Roosevelt Meadows, although the camp was never actually used as an organizational camp. Although he had originally planned to operate a camp for mentally retarded children in conjunction with three Regional Centers, shortly before entering into a contractual agreement, Slater was approached by My Family, Inc, with a "picture of desperate plight" and as a result, in 1975 he leased the property to "My Family," a drug rehabilitation program sponsored by Riverside County and supervised by the Mental Health Services Department. Interestingly, Slater allowed clients of My Family to reside on the property beginning on May 1, 1975, almost one month before applying for an organizational camp SUP from the U.S. Forest Service and it was not until 1976 that the County of Riverside Planning Department issued PUP 328 for this change in land use.

The length of time My Family operated at the former Camp Roosevelt is uncertain, but on February 10, 1978 Mr. Slater requested permission from the U.S. Forest Service to sublease the Camp Roosevelt property to the California Conservation Corps for establishment of a camp and permission was given the same day. The C.C.C. camp apparently operated until some time prior to 1984, although substantive information is not available regarding specific dates of camp operation. In 1988 Slater sold the Camp Roosevelt property to Joe Bobker, who ran an organizational camp known as Camp Mesorah on a portion of the property. In 1994 Bobker sold the property to Camp Ronald McDonald for Good Times, which has been in operation as a cost-free medically-supervised camp for children with cancer and their families since that time.

Fieldwork

Two cultural resource occurrences were recorded on the subject property during the 1994 Phase I Cultural Resources Assessment: a small granitic boulder with a 'scary face' painted with oil-based blue paint and a rectangular formation of ±45 rocks. Despite intensive scrutiny of the areas in which the resources were recorded, they could not be relocated during the current field survey. The boulder was obviously the work of young camp artists, so its presence was noted in the 1994 report, but consideration beyond recordation in the report was not recommended and over the intervening year it may have been moved or covered by vegetation. Based on the size and shape of the rock formation it was determined that it could possibly represent a grave, albeit not of Native American origin. The 1994 report recommended that either the feature be preserved through avoidance or that a limited Phase II Investigation be conducted to determine what lay under the rock. Since the feature was located in a 100-year floodplain and removed from camp activities, the project sponsor chose to preserve the feature through avoidance. Considering its location on the western bank of a large and active watercourse, it may be that the rocks have been dispersed by flooding over the past 14 years and so are no longer in a recognizable formation.

Numerous cultural resource occurrences of both historical and contemporary origin were observed within the project boundaries during the current field survey. The resources represent various land use activities conducted on the subject property since 1952 including an organizational camp, private school, drug rehabilitation center, work camp, recreational camp, and currently, Camp Ronald McDonald for Good Times, a cost-free medically supervised camp for children with cancer and their families.

Buildings currently located within the bounds of the subject property include a dining hall, office, kid's kitchen, two caretakers' houses and mobilehome, a medical complex, costume shed, art building, bike garage, fire suppression center, storage buildings, and several cabins of varying sizes. In addition to the camp buildings there are a number of structures, including a pool, shower house/tent, archery range, campfire, pond, the Bob Chandler Courage Course, old teepees, new teepees, volleyball court, basketball court, activity tent, corrals, a bridge, and stone entry monument. Miscellaneous concrete pads, benches hewn from logs, and many trails are scattered through the property, as well.

Camp Roosevelt, which operated from 1952 to 1972, was the first occupant of the subject property and only buildings constructed during the early years of the camp are considered to be of historical origin. As discussed in the previous section, accurately determining which buildings were constructed during the early period is somewhat problematic due to cartographic inconsistencies, lack of documentation, and substantial alterations. However, after comparing existing building locations to those shown on the 1959 USGS Idyllwild 15' topographic map, it was concluded that 12 existing buildings were probably built prior to 1959, with the remainder built between 1960 and 1997. Based on the field evaluation, it was determined that the campfire structure was probably also from this period, but was too small to appear cartographically. These 12 buildings and one structure located within the boundaries of the subject property, as shown in Figure 11, have been recorded as the historical Camp Roosevelt and assigned primary site number 33-17126 by the Eastern Information Center, University of California, Riverside. Buildings outside the property boundaries are not included in this report. Following are descriptions, evaluations, and photographs of each of the components of historical Camp Roosevelt located within Camp Ronald McDonald.

Dining Hall

Although the dining hall was one of the first buildings constructed at Camp Roosevelt, it is currently one of the most modern camp buildings, having been extensively renovated. The original building configuration is unclear because it has been enlarged over the years to accommodate an increased population and altered to facilitate the addition of certain architectural elements. The current building configuration is a

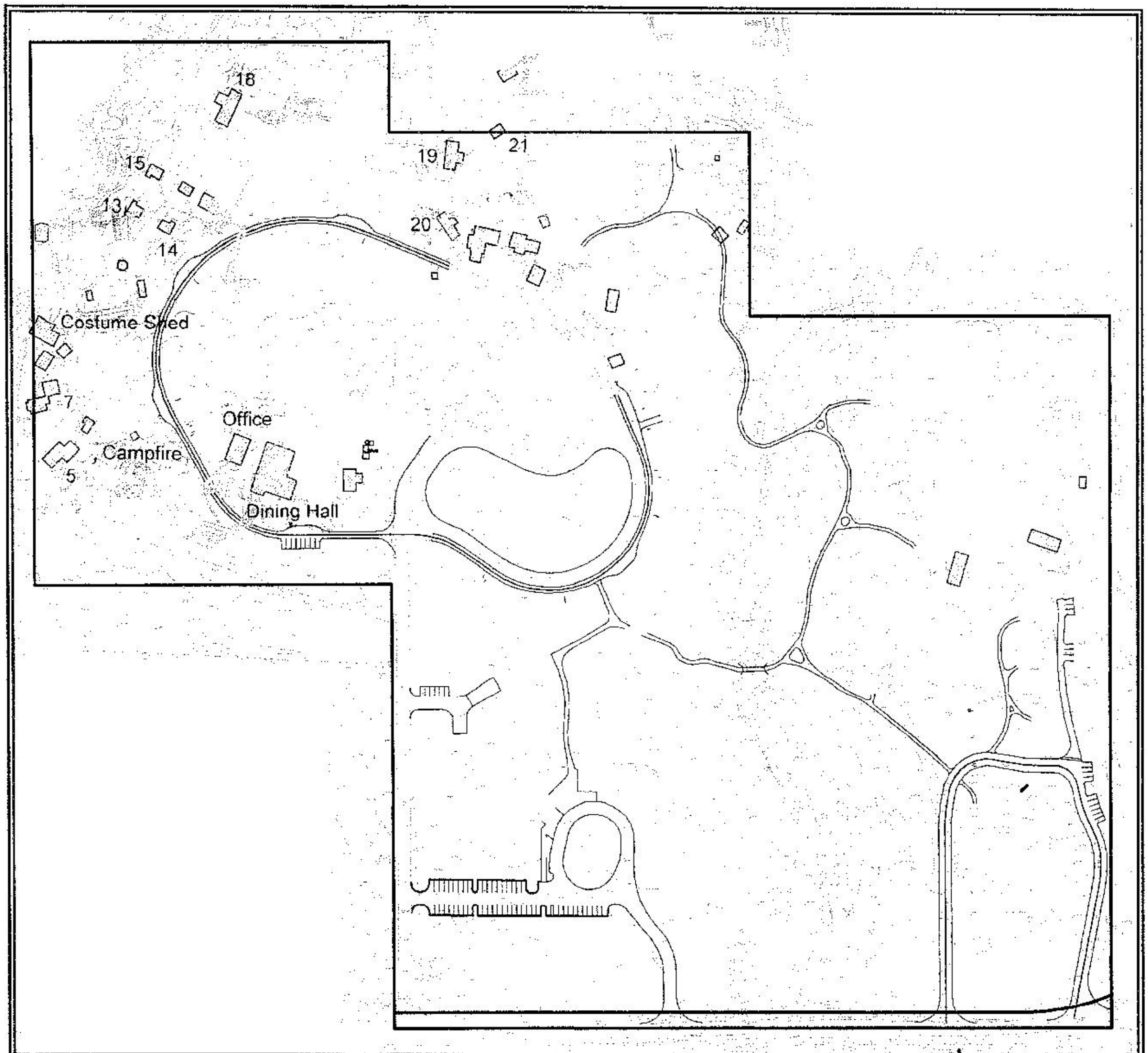


Figure 11: Location of existing historical Camp Roosevelt buildings and structures.

compound plan with irregularities created by a front entry room and two large rear additions. It is unclear whether the original building had a steep-pitched front-gable roof or whether the existing steep central gable represents a later feature added to facilitate installation of several skylights. The roof on either side of the central gable has a very low pitch that may be the result of expansion and tying into the original building. A small entry room added to the front of the dining hall has a low-pitched side-gable roof covered by the same dark green composition shingles that are found on the main dining hall roof. Wall cladding on the main dining hall building is flush horizontal tongue-and-groove (T & G) wood boards, while that of the entry room is plywood with vertical

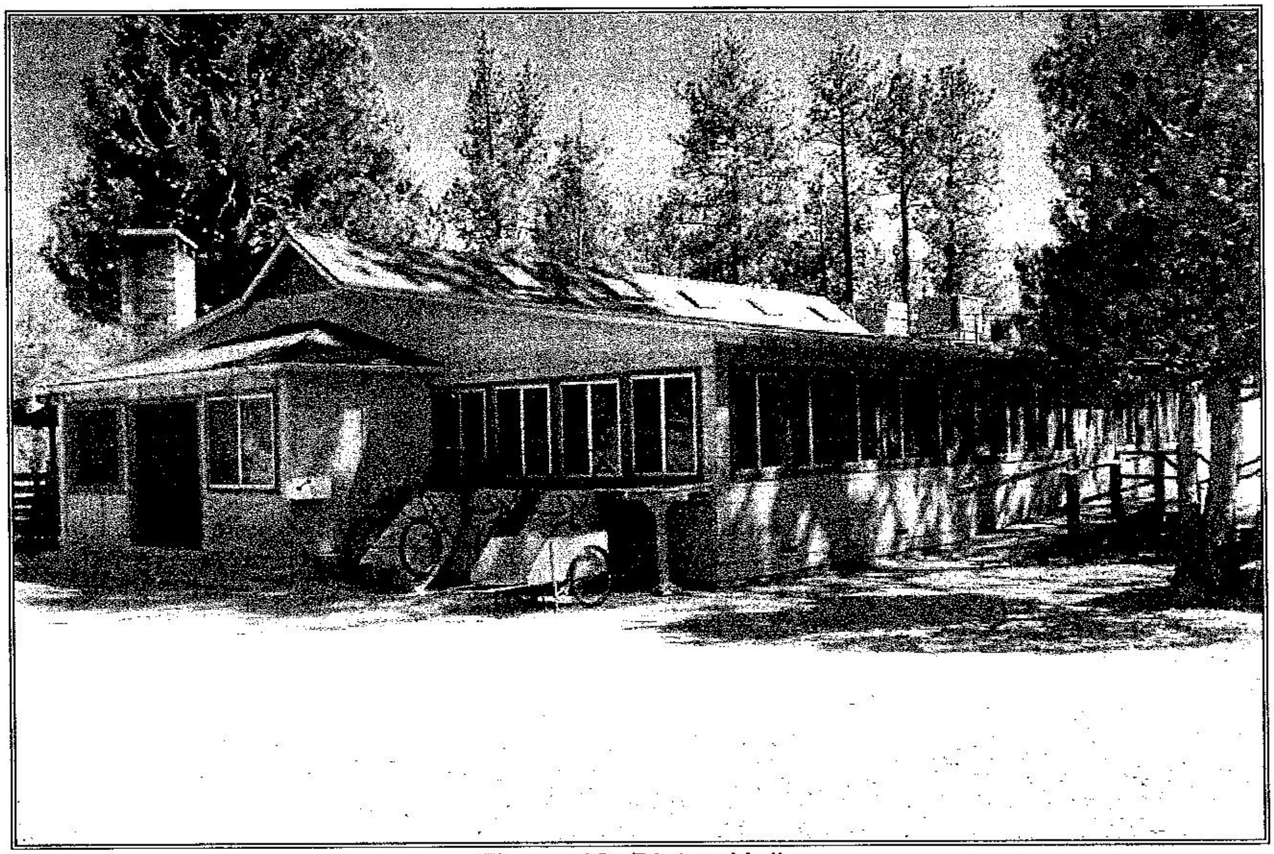


Figure 12: Dining Hall.

battens covering the joints, and that of the room additions at the rear of the dining hall are concrete block. All windows of the dining hall are aluminum sliders, but it was not evident whether they replaced original wood frame windows or whether they reflect a contemporary expansion. A patio has been built on the eastern side of the dining hall to allow outdoor dining. The wood-frame addition has a shed roof covered with corrugated metal panels (CMP) and is partially enclosed by a wood half-wall. Proposed plans for the Camp Ronald McDonald redevelopment call for retention of the dining hall.

Administration Building (Office)

Constructed on a two-unit massed plan, the original building has a hipped roof (with ridge) and a louvered, flat-roofed dormer on the west side that provides attic ventilation. A flat-roofed screened porch has been built on to the eastern wall of the original building. Roofing materials found on the hipped roof include old green composition shingles and new green/white composition shingles, while that on the screene porch

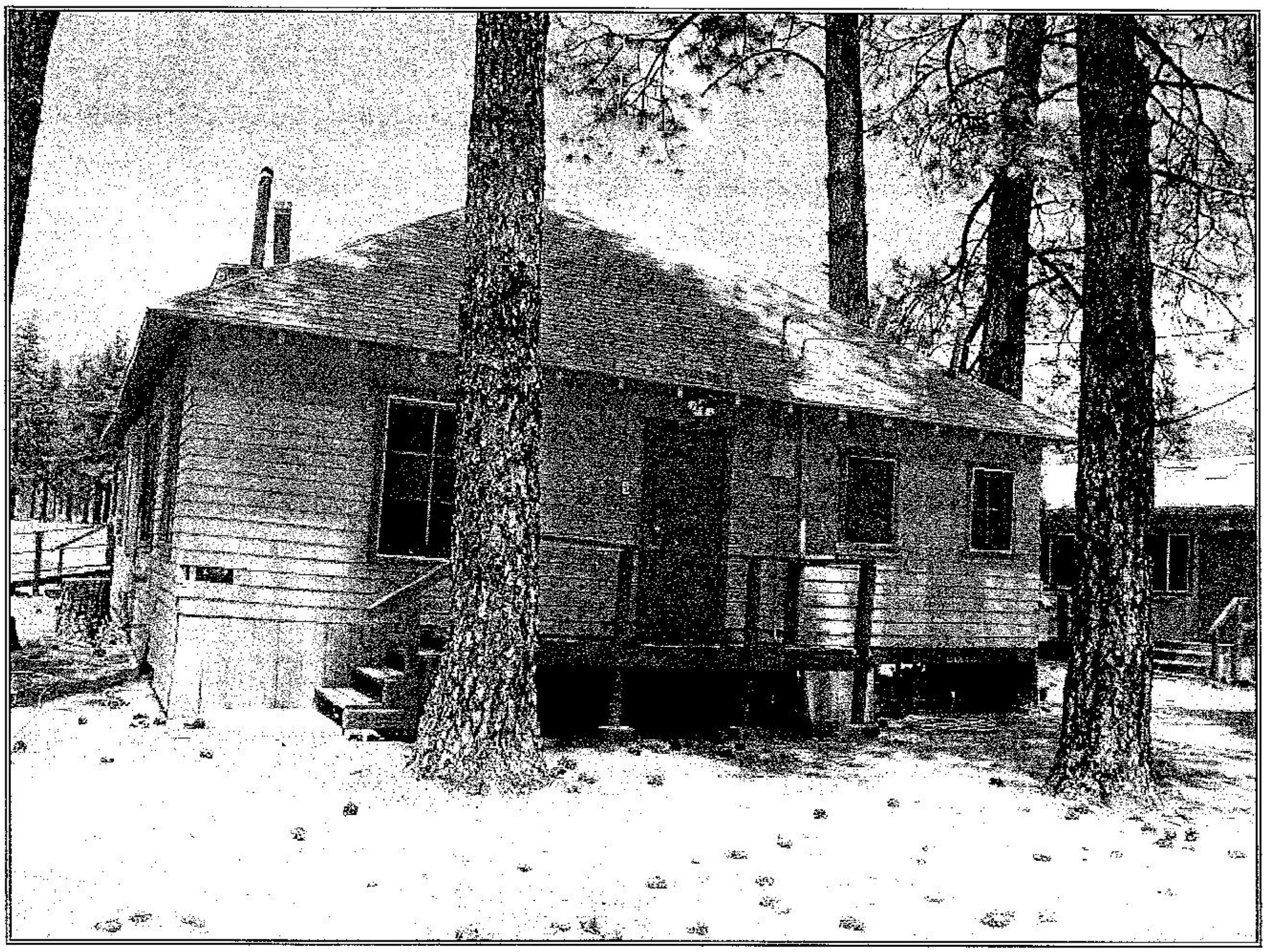
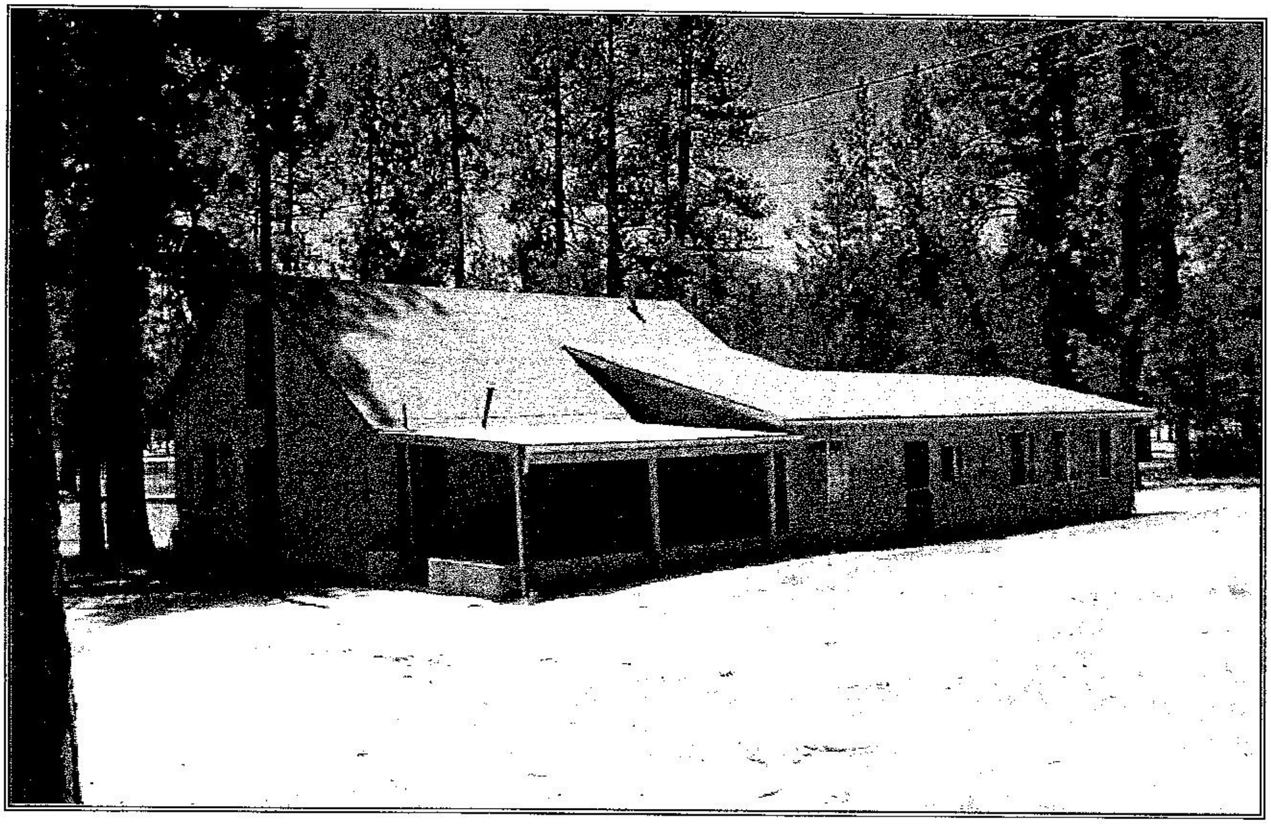


Figure 13: Views of the Administration (Office) Building.

room addition is CMP. The building is clad in 1" x 6" horizontal clapboard wood siding that extends to the ground in some areas, concealing the pier-and-post foundation. Several of the boards are broken or missing, particularly in those areas near the ground surface. A raised porch with rails, steps, and wheelchair ramps has been built across the front of the office building and a raised porch with steps provides access to the rear door. The building possesses a motley assortment of both original and replacement windows which include fixed-frame aluminum, aluminum sliders, multi-pane metal frame casement, multi-pane wood frame casement, and fixed wood frame. All windows have been covered by aluminum screens which fit inside the 1" x 6" wood casings. The historical integrity of this building has been diminished by new roofing, aluminum windows, screen doors, aluminum window screens, and new porches that include stair and wheelchair ramps.

Cabin 5

This building is comprised of four residential units representing various periods of construction. What appears to be the original unit (A) is a front-gabled 1½ story building clad in staggered wood shingles above a concrete foundation covered by plywood and logs. The single-story addition houses two side-gabled units and one front-gabled unit. Green composition shingle roofing covers the original building and the addition, with CMP on the covered patio. While the upper wall cladding of this portion of the building is also staggered wood shingles, the lower portion is exposed concrete block foundation. A large covered patio, enclosed by a concrete block quarter-wall, connects the original building with the addition. The original building has two fiberboard entry doors, one for each story, but a staircase leading to the upper door no longer exists. With the exception of a wood frame double-hung window in the upper story, all windows of Cabin 5 have been replaced by aluminum sliders. A substantial amount of woodpecker, rodent, and insect damage, as well as dry and wet rot were observed on most exterior walls. Although this was one of the first Camp Roosevelt buildings, constructed prior to 1952, its historical integrity has been greatly compromised by room additions, the attached patio, new roofing, aluminum window replacement, removal of the exterior stairway, fiberboard doors, screened doors, and aluminum screens over the windows.



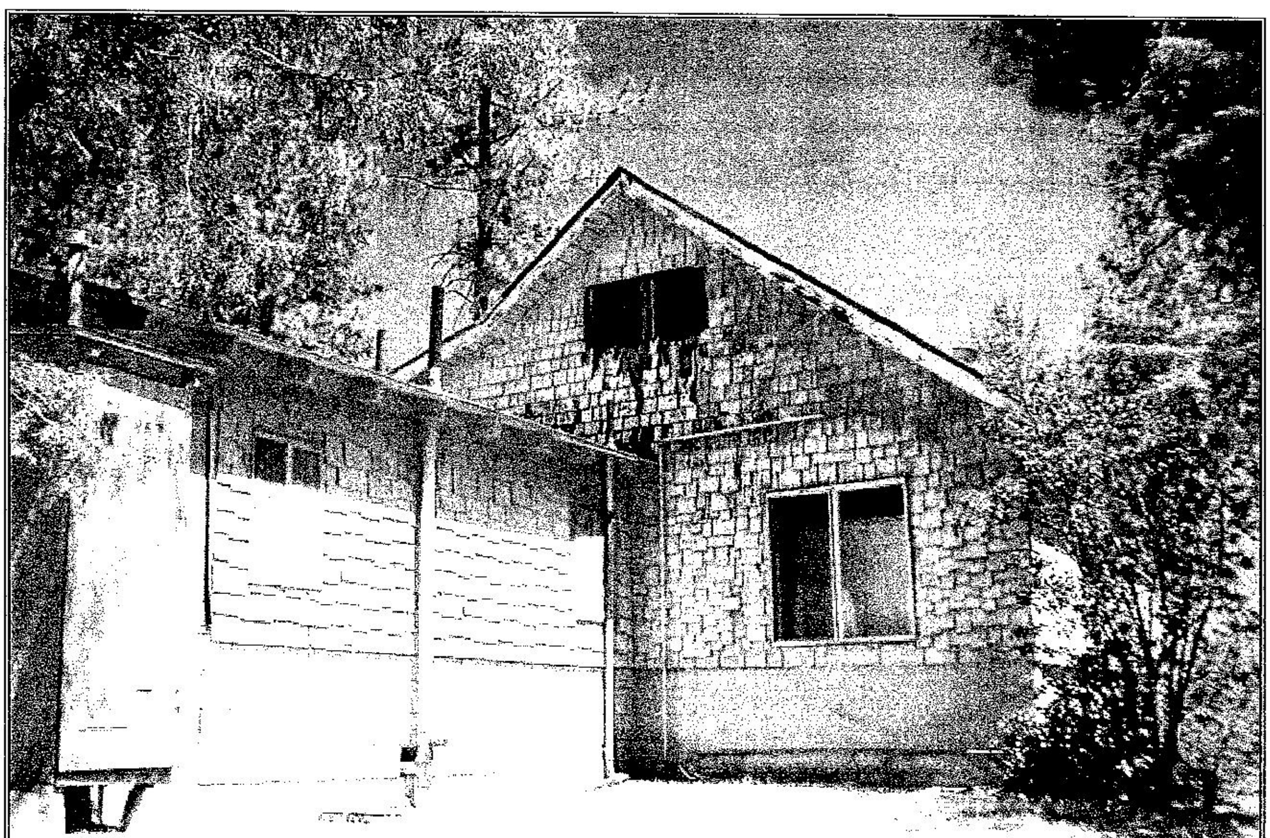


Figure 14: Views of Cabin 5.

Cabin 7

Originally Dan Slater's residence, this is the oldest Camp Roosevelt building. Due to extensive remodeling and additions, however, the historical integrity of the original 1 ½ story building has essentially been destroyed. A second house has been built to the north of Slater's house and the two have been integrated into a single building, connected by a large raised wooden deck. What had been an open porch on the southwestern side of the original house has been enclosed with sheets of plywood, creating another room addition to the original house. Wall cladding on Slater's residence, as well as on part of the second house, and a portion of the room addition, is T & G quarter-log siding, a material that first gained popularity approximately 50 years ago as a relatively inexpensive way to create a "log cabin" look for mountain homes. The house has retained some of the original wood frame double-hung windows, but many have been replaced by aluminum sliders. The second house and room addition have aluminum slider windows. Determining the orientation of the original house is difficult due to the amount of construction that has occurred and the division of the house into multiple residential units, each with its own access. Since access to the upper story is via a large exterior staircase, this would seemingly be the rear of the residence, with the main entry being on the north side and thus, have a front-gabled orientation. Both buildings have green composition shingle roofing, which extends over the covered wood deck and the shed roof of the enclosed porch.

Campfire

The historicity of the Campfire is inferred by its probable association with Camp Roosevelt, but evidence to substantiate the inference could not be found. The campfire structure is comprised of a raised wood floor over which is a shed roof supported in the front by wood posts and in the back by a wood frame wall clad in T& G quarter-log siding. New corrugated metal panels cover the roof and hang down in front, forming a short curtain. Compartments are located behind the wall for firewood storage and the front of the structure functions as an outdoor theater. In front of the structure is a fire pit constructed of rocks and concrete, as well as benches made of hewn logs. Much of the structure and fire pit have been rebuilt with new materials and many of the benches are clearly of recent origin, thus diminishing the Campfire's historical integrity.

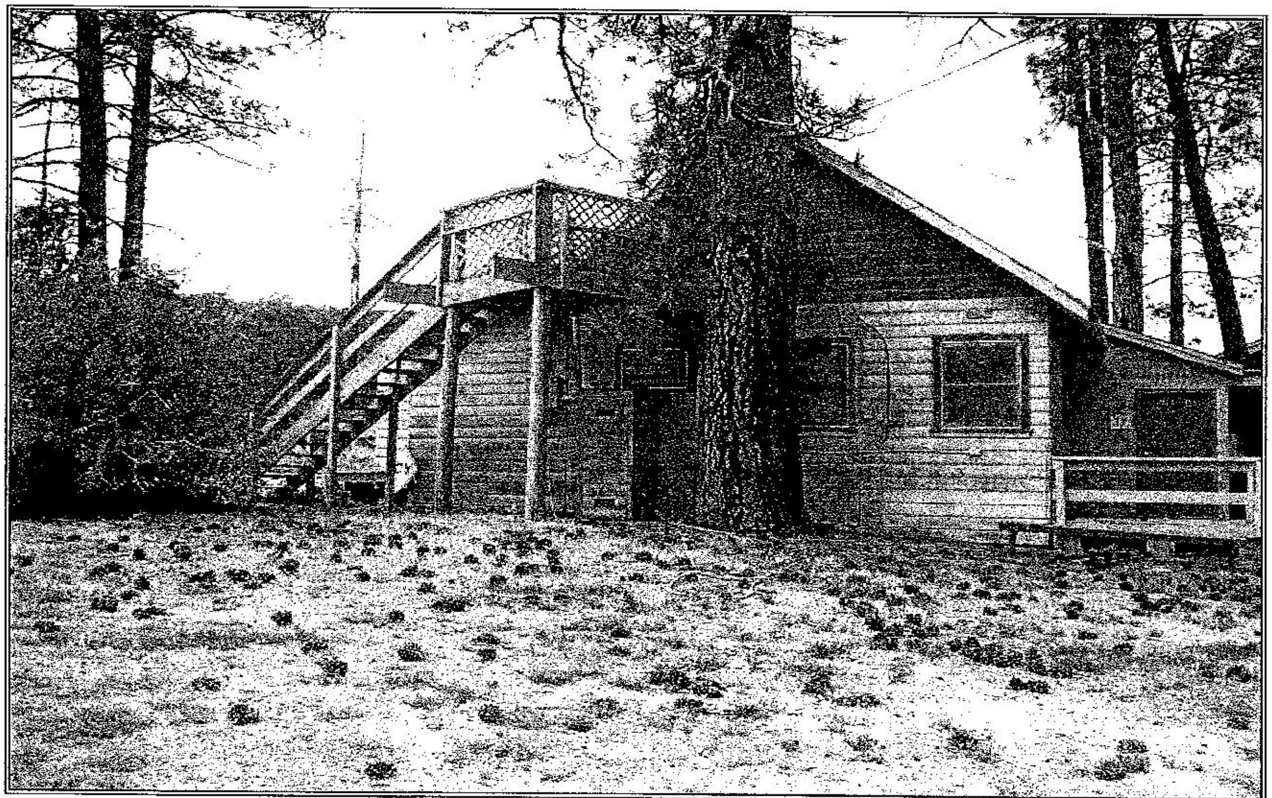


Figure 15: View of the original Cabin 7.

Figure 16: Frontal view of original and contemporary portions of Cabin 7.

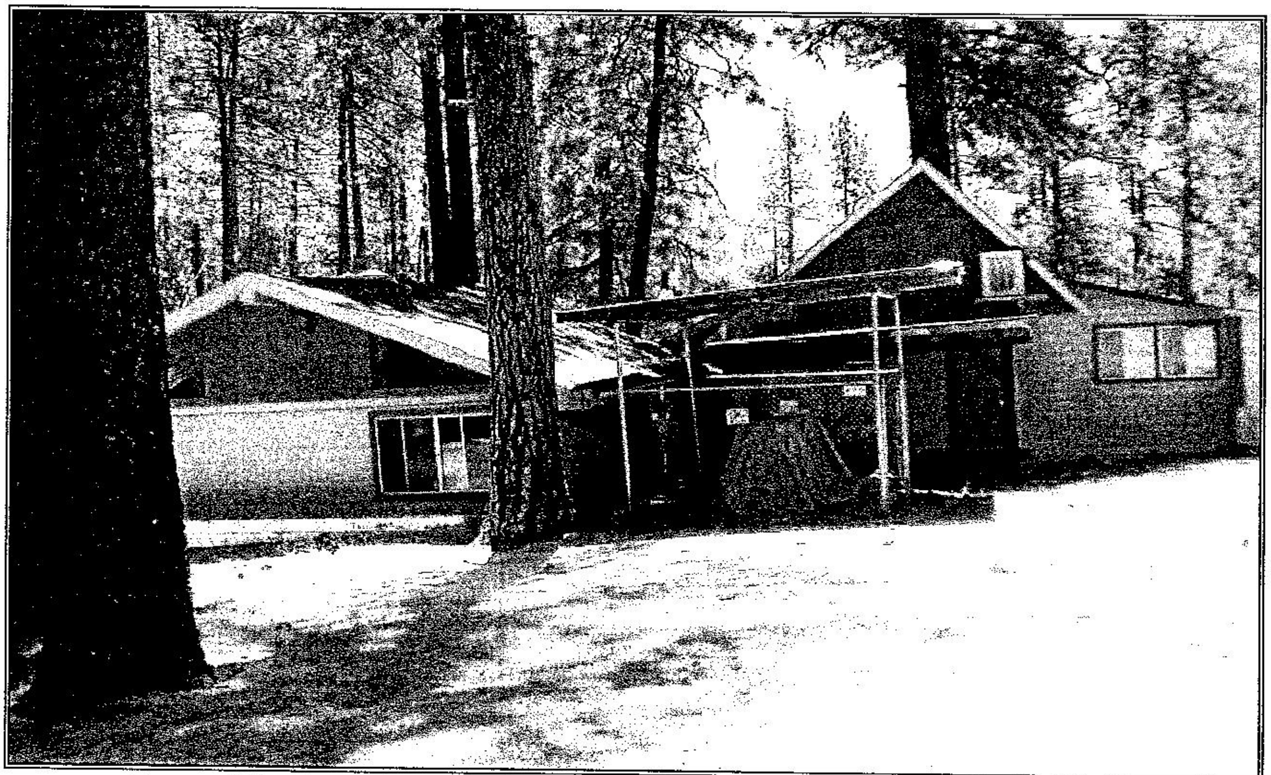


Figure 17: Rear view of original and contemporary portions of Cabin 7.

Figure 18: Campfire with "theater."

Costume Shed

One of the circa 1952 Camp Roosevelt buildings, the historical integrity of this building had been destroyed by integrating the original cabin and three large room additions into a single building. Wall cladding on the original building is horizontal clapboard siding, on the southeastern addition it is T & G quarter-log and half-log siding, and on the western and northern additions it is vertical sheets of plywood with battens covering the joints. The pyramidal hipped roof of the original building is covered with new green/white composition shingles, while the shed roof of the southeastern addition and flat roofs of the other additions have green composition rolled sheeting. Windows of the original cabin are currently covered with plywood so it is not possible to determine whether they are replacements or original. It is possible that the southeastern addition was once a screened porch and the main entry to the Costume Shed is now through a door in this portion of the building.

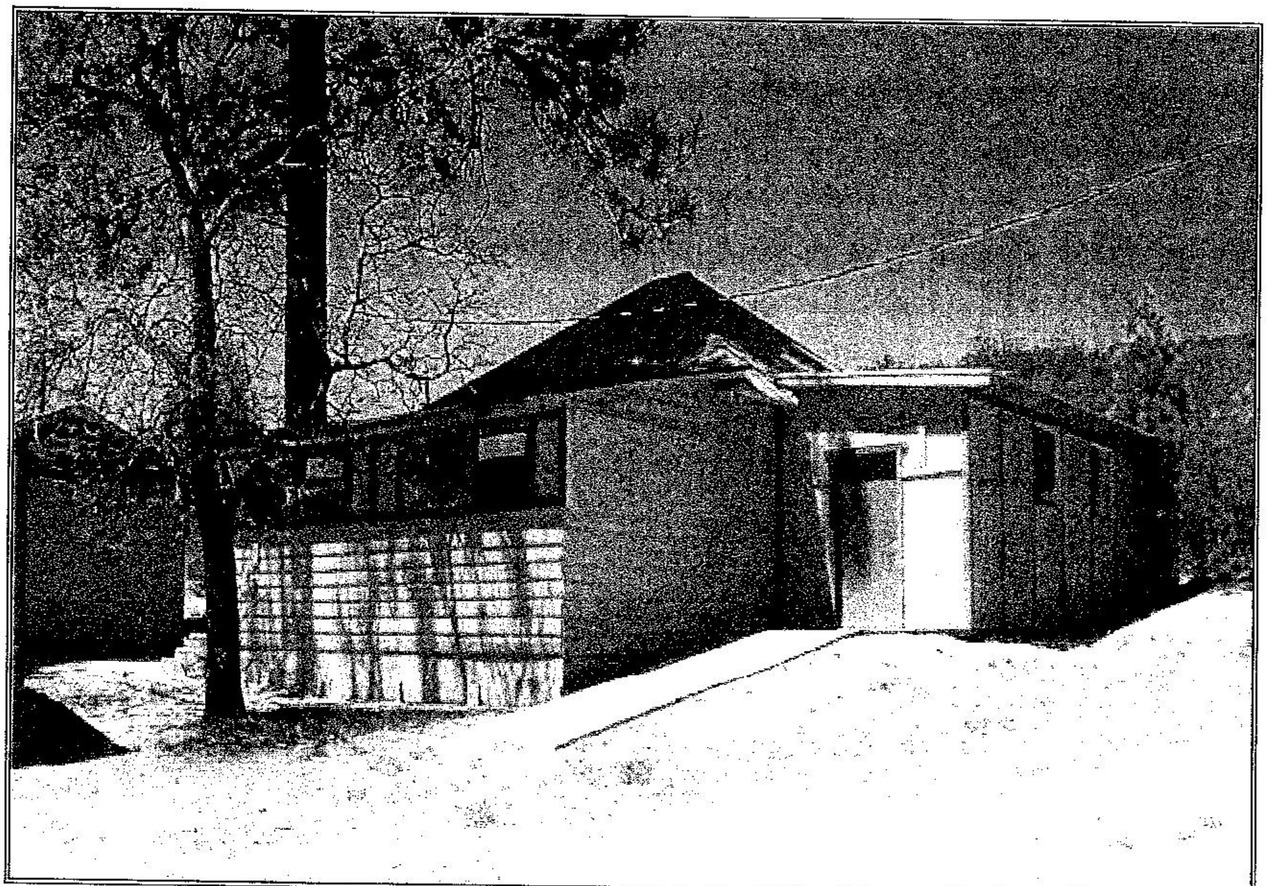


Figure 19: View of two Costume Shed additions and original hipped roof.

Cabin 18

This was the northern-most cabin in a cluster of seven cabins built between 1952 and 1959 and by far the largest. While it appears that the original cabin was built on a four unit linear plan with a residential unit later added to the west wall, it is possible that the original cabin actually had a compound plan that included this ancillary room. The existing cross-gabled cabin has a steeply pitched roof covered in old green composition shingles. Wall cladding is uniformly T & G quarter-log siding, with plywood skirting used to enclose the crawlspace beneath the cabin, although the concrete piers generally remain exposed. New raised wood decks have been added to the north and south entrances with access provided by stairs on both and a wheelchair ramp on the main, south entrance. Aluminum sliders have replaced all original wood frame windows and all are covered by aluminum screens. The attached room currently houses the camp radio station.

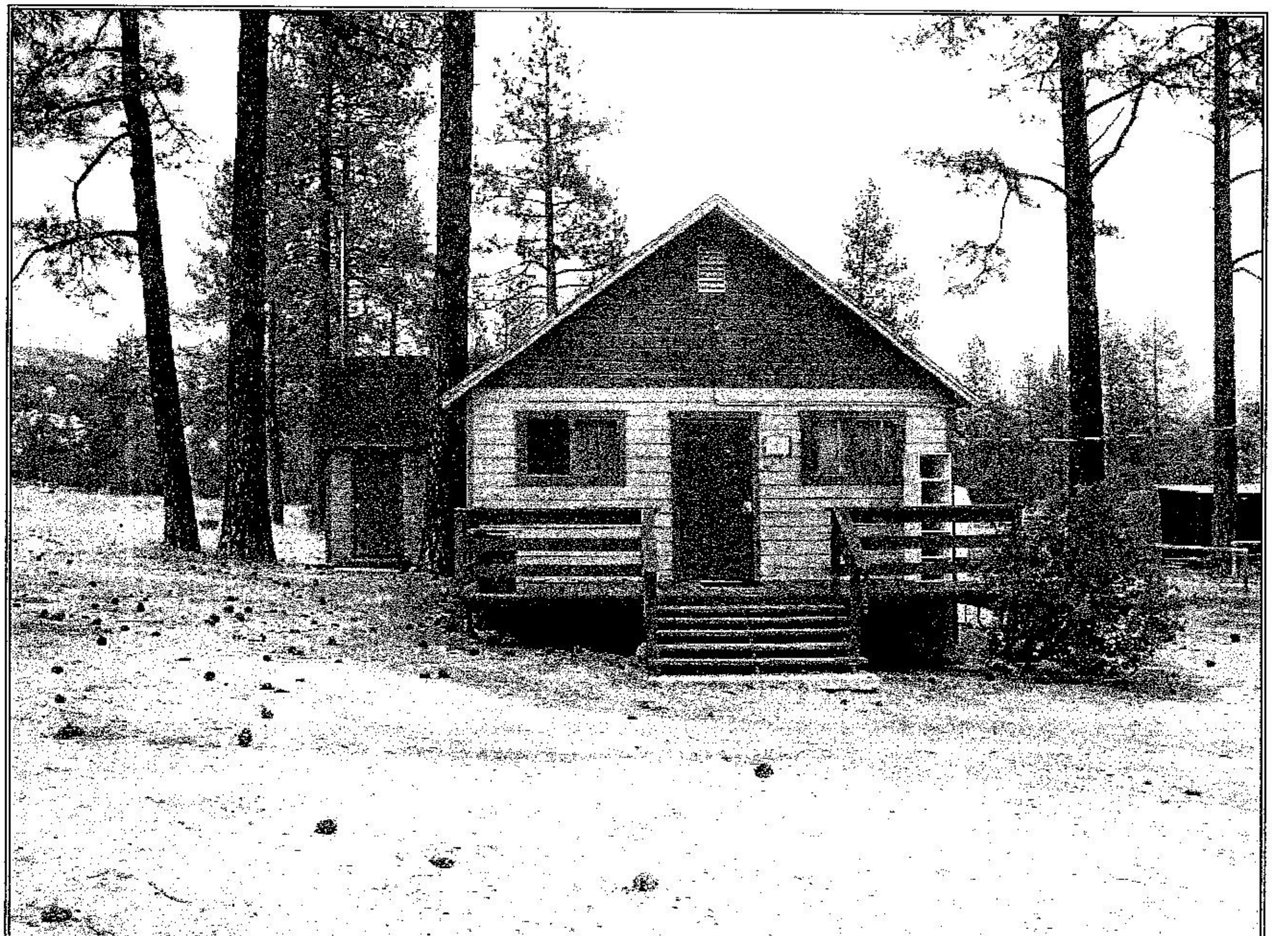


Figure 25: Frontal view of Cabin 18.

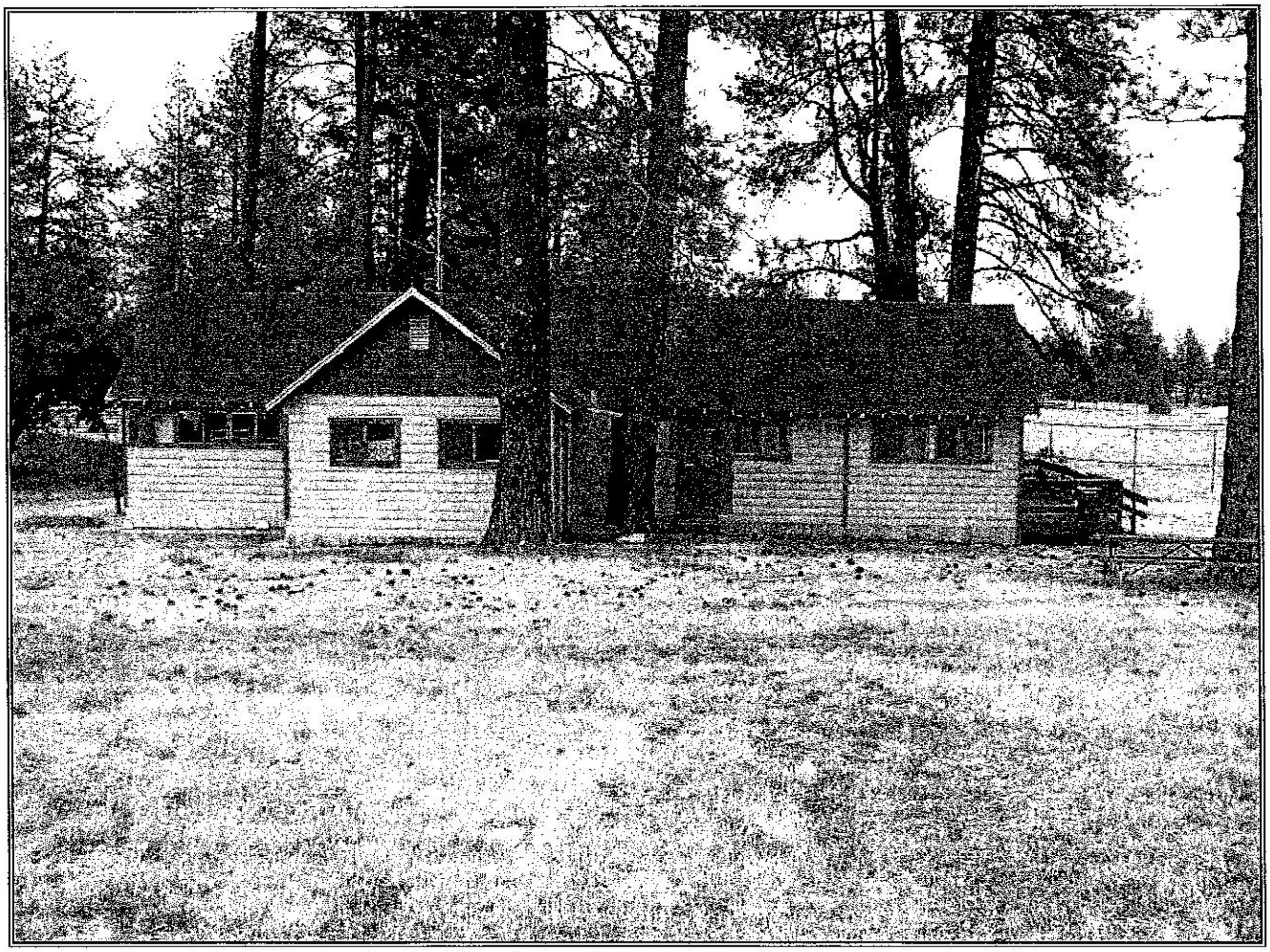


Figure 26: West side view of Cabin 18 showing room addition.

Cabin 19

Similar in design and construction to other Camp Roosevelt cabins, Front-gabled Cabin 19 was originally built on a three-unit linear plan. At some later time, a large bathroom was added to the east side of the cabin, creating a cross-gabled profile. The steeply pitched roof is covered by a combination of old green composition rolled sheeting, old green composition shingles, and new green/white composition shingles. Wall cladding is horizontal T & G quarter-log wood siding on the original cabin and exposed joint vertical plywood sheets on the room addition. All original windows have been replaced with aluminum sliders and a skylight has been installed over the bathroom. New raised wood porches, stairs, and wheelchair ramps have been built onto the front and rear entrances to the building. This cabin lacks historical integrity as a result of the various additions and replacement of original construction materials.

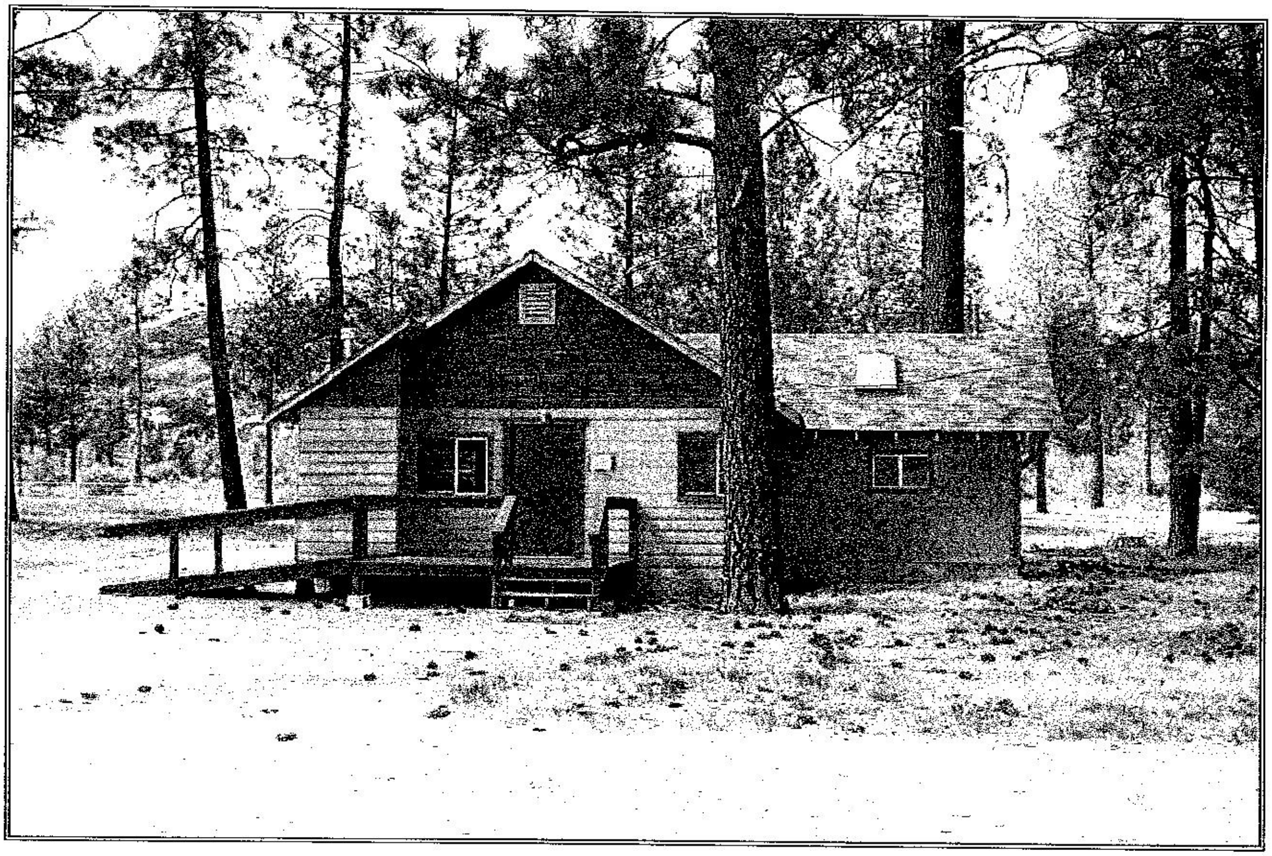


Figure 27: Views of Cabin 19.

Cabin 20

This cabin has been extensively remodeled and reconstructed, thereby destroying any semblance of historical integrity. The original building configuration was a front-gabled, three-unit linear plan, but two rooms with shed roofs were added to the northeast wall some time ago, resulting in a side-facing compound plan. Covering the steeply pitched original roof and the shed roofs of the additions is green composition rolled sheeting. Wall cladding is an interesting combination of new vinyl siding, horizontal T & G quarter-log wood siding, horizontal T & G 1" x 8" siding, and plywood. All original windows have been replaced with new vinyl windows. In addition, there are new doors, new screen doors, and new wood decks with stairs and wheelchair ramps added to the front and rear entries.

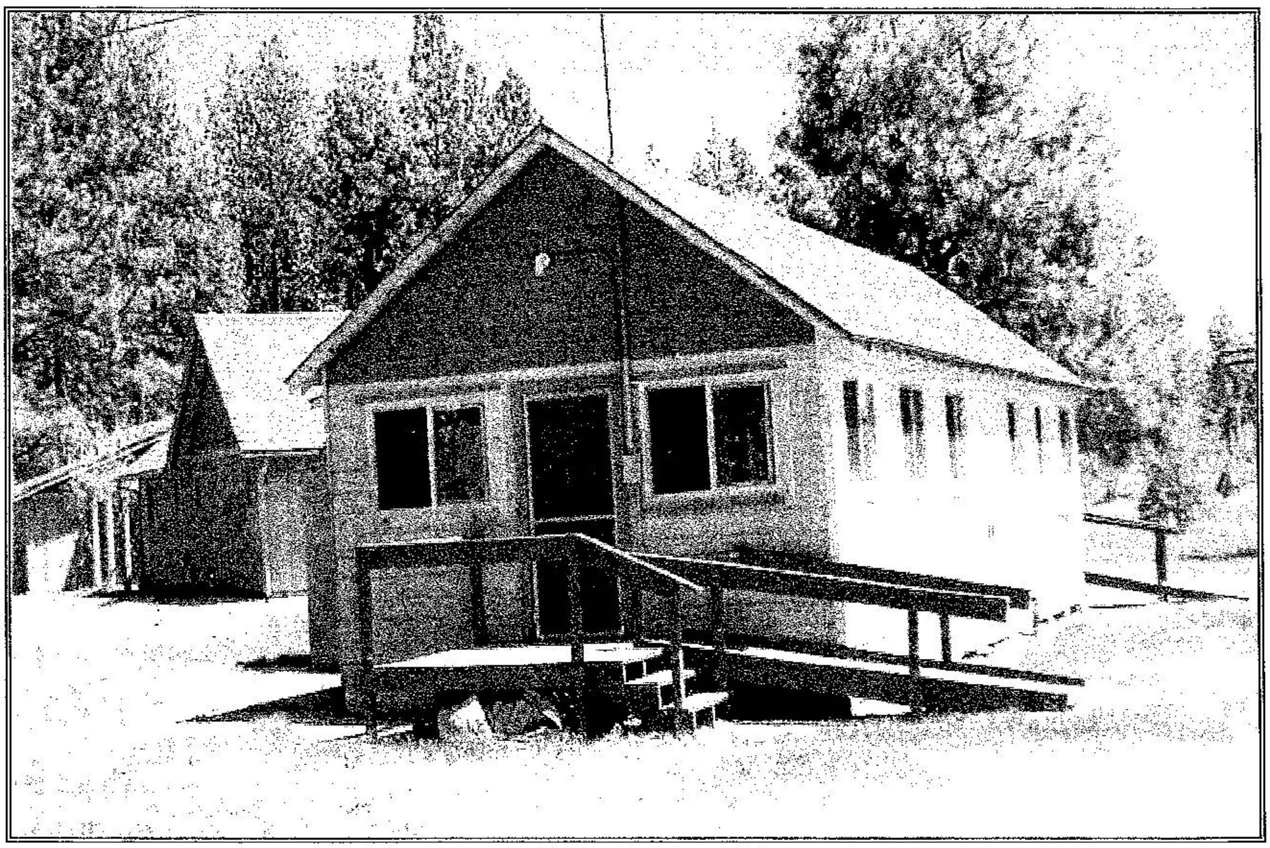


Figure 28: Frontal view of Cabin 20.

SIGNIFICANCE

Evaluations for site significance are typically made with respect to eligibility criteria for nomination to the National Register of Historic Places. Since this measure of significance has come to be the determining factor in whether or not a particular site warrants consideration by the federal government in federally funded projects, state and local governments often use it to assess sites, as well. The State of California has established its own criteria, as set forth in the California Environmental Quality Act (CEQA) and since this is the principal statute utilized by the County of Riverside Planning Department in processing Camp Ronald McDonald for Good Times, the resources comprising historical Camp Roosevelt, site 33-17126, will be addressed accordingly.

The California Environmental Quality Act applies to all discretionary projects and equates a substantial adverse change in the significance of a cultural resource with a significant effect on the environment (Section 21084.1). "Substantial adverse change" is defined as demolition, destruction, relocation, or alteration activities that would impair significance (Section 5020.1). CEQA has three separate mechanisms for determining whether a historical resource is significant and thus subject to impact mitigation considerations. First, resources that are listed in or eligible for listing in the California Register of Historical Resources (hereafter, California Register) are presumed to be archaeologically, historically, or culturally significant. Second, resources that are listed in a local register or deemed significant in a historical resource survey as provided under Section 5024.1(g) are presumed to be significant unless the preponderance of evidence indicates they are not. Finally, a resource that is not listed in or determined to be eligible for listing in the California Register, not included in a local register of historic resources, or not deemed significant in a historical resources survey may still be considered significant pursuant to Section 21084.1.

According to the *Regulations for California Register of Historical Resources* formally adopted by the State Historical Resources Commission on January 1, 1998 an historical resource must be significant at the local, state, or national level under one or more of the following four criteria:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history , or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory of the local area, California, or the nation.

The types of cultural resources eligible for nomination to the California Register, and thus considered historically or archaeologically significant by CEQA, are buildings, sites, structures, objects, and historic districts.

Standards such as those of the California Register were established with the recognition that not every property of a certain age is necessarily significant and what is significant can only be determined by the integrity of the resources and by the historic context in which the property exists. A resource may be *historical* in that it is at least 50 years of age, but it is not necessarily *historic* in that it was important to history. Despite the existence of the above eligibility criteria and similar guidelines for assessing archaeological or historical significance found in other legislation, the determination of significance remains a somewhat subjective, and often difficult, endeavor. This is primarily due to conflicting perceptions of "important" or "distinctive" or "contributing," but also because it is not always easy to remain objective when considering the past.

Data compiled from all research determined that neither the buildings nor the Camp Roosevelt site would qualify as significant historical resources according to the above criteria. Due to conflicting cartographic evidence and a lack of substantive documentation, accurately determining which existing buildings were constructed prior to 1959 and could thus be classified as historical structures was problematic. Further, since every potentially historical Camp Roosevelt building and structure as been subject to substantial alteration, none have maintained their historical integrity and this is a key consideration in determining whether an historical resource is significant according to CEQA criteria. Rooms have been added to almost every historical building, all have had their original wood frame windows replaced with aluminum and vinyl windows, most buildings have been re-roofed, many have had original siding replaced, and new decks, stairs, and wheelchair ramps provide access to every historical building. While the basic Camp Roosevelt buildings and structures remain, each has been altered by successive users for the past +50 years and as such, cannot be considered significant historical resources.

Camp Roosevelt operated as an organizational camp for Jewish young people from 1952 to 1972 so its existence during the historical period was very limited. Between 1972 and 2008 the former Camp Roosevelt property hosted several diverse occupants, including a private school, drug rehabilitation center, work camp, recreational camp, and most recently, a camp for children with cancer and their families. Each of these occupants had their own identity and none of them used the name Camp Roosevelt. Consequently, there is neither continuity of use nor prolonged association with the historical Camp Roosevelt, it was simply the first of many occupants. The camp was not associated with any events that made a significant contribution to history, nor to any individuals who were important to local, state, or national history. The fact that so little information exists about the camp speaks loudly to its lack of importance, even in the local community.

RECOMMENDATIONS

Based on the current project design, the Camp Ronald McDonald for Good Times redevelopment project will adversely impact the historical Camp Roosevelt building and structures since the development plan necessitates demolishing all but the Dining Hall. However, due to the very limited period of historical occupation, no continuity of use or prolonged association of the subject property with historical Camp Roosevelt, and the camp buildings' lack of historical integrity, it was determined that neither the Camp Roosevelt site nor the buildings contained therein would be considered significant cultural resources according to California Environmental Quality Act criteria. As such, based on this finding of no significance, the research, photographs, description, and architectural evaluation of the buildings and structures, as documented within this Phase I Cultural Resources Assessment report, is sufficient consideration for cultural resources currently located within the boundaries of Camp Ronald McDonald for Good Times. As such, neither further research nor mitigation is recommended. Should subsurface cultural resources be discovered during earthmoving activities, however, said activities shall be halted or diverted until a qualified archaeologist can evaluate the resources and make appropriate recommendations.

CONSULTANT CERTIFICATION

The undersigned certifies that the attached report is a true and accurate description of the results of the Phase I Cultural Resources Assessment described herein.

Jean A. Keller, Ph.D. — Date: May 28, 2008

Jean A. Keller, Ph.D.
Cultural Resources Consultant
Riverside County Registration No. 232

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1901 Map: San Jacinto, Calif. (30', 1:125,000); surveyed in 1897-1898
1959 Map: Idyllwirld, Calif. (15', 1:62,500); aerial photos taken in 1955
1959 Map: Santa Ana, Calif. (1:250,000); aerial photos taken in 1955
1981 Map: Idyllwild, Calif. (7.5', 1:24,000); aerial photos taken in 1975, field checked in 1976)
1988 Map: Idyllwild, Calif. (7.5', 1:24,000); 1981 edition photorevised, aerial photos taken in 1985
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APPENDIX

Sacred Lands File Search Request
Sacred Lands File Search Results
Project Scoping Letters
Tribal Response to Project Scoping Letters

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 10, 2008

Mr. Dave Singleton
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Re: Sacred Lands File Search Request – Camp Ronald McDonald for Good Times
APN 568-070-001, 002, 013, 024

Dear Mr. Singleton,

This firm is currently conducting research for a Phase I Cultural Resources Assessment of the referenced project. As part of this research, I am requesting a search of the Sacred Lands Files maintained by your agency, as well as a list of any tribes that may be interested in providing input for this project. Following is a summary of the relevant project information.

Proposed Project: Camp Ronald McDonald for Good Times

Existing Land Use: Camp Roosevelt

Acreage: ±59.0 acres

Location: North & east of Hwy. 74, north & west of Apple Canyon Road, near Idyllwild, Riverside County (Section 4, T.6s, R.3e)

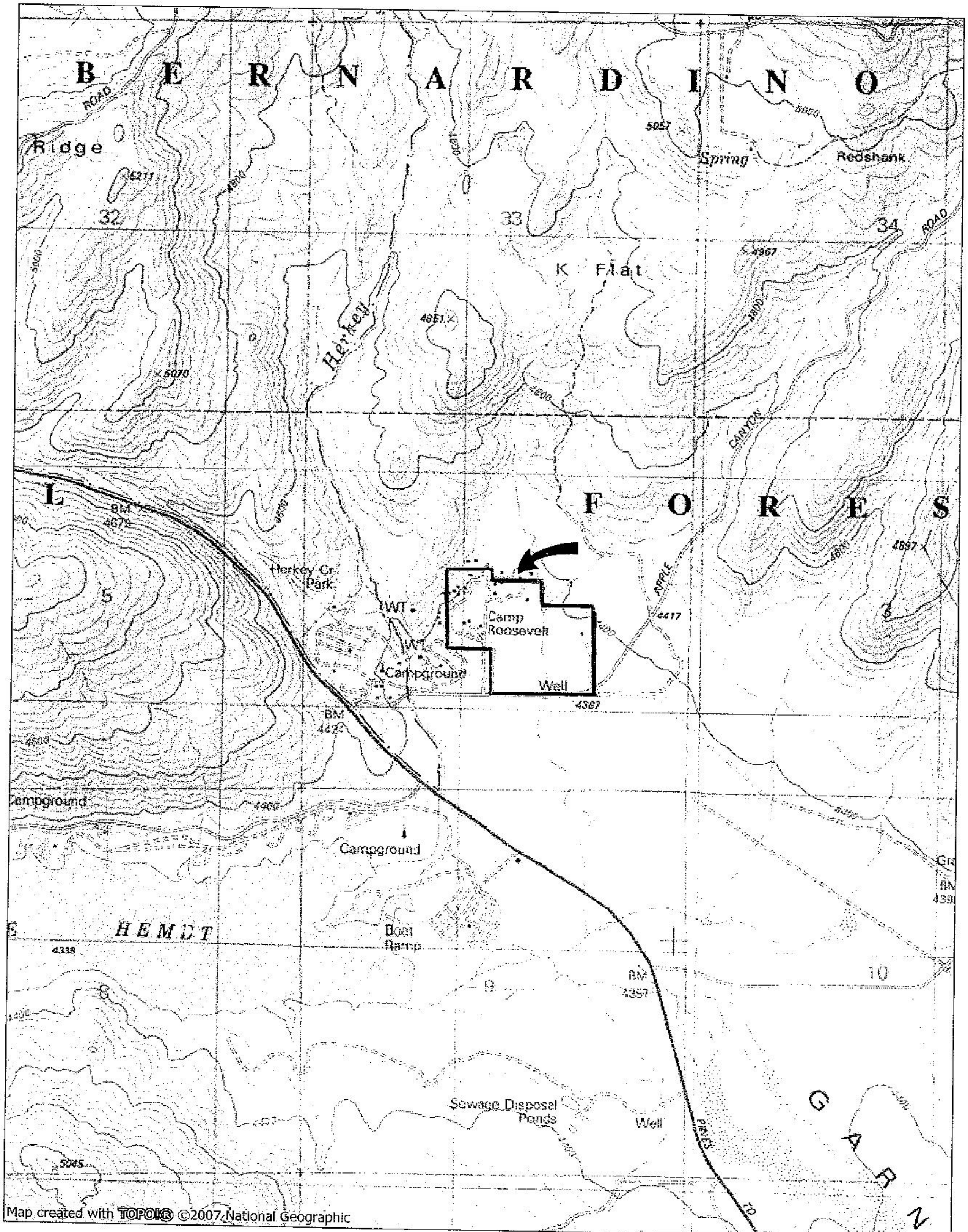
Map: USGS Idyllwild, California Topographic Maps, 7.5' series.

Should you require any additional information, please contact me at your convenience. Thank you for providing this valuable service.

Sincerely,

Jean A. Keller

1042 N. El Camino Real, Suite B244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com



IDYLLWILD, CALIF.

NW/4 IDYLLWILD 15' QUADRANGLE

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0.0 0.5 1.0 km

TN MN 12½°

04/11/08

1981

PHOTOREVISED 1988

DMA 2651 II NW—SERIES V895

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

April 15, 2008

Dr. Jean A. Keller, Ph.D.
Cultural Resources Consultant
1042 N. El Camino Real, Suite B244
Encinitas, CA 92024

Sent by FAX to: 760-634-2993
Number of Pages: 3

Re: Request for a Sacred Lands File records search for the proposed Camp Ronald McDonald for Good Times Project; located near the Community of Idyllwild; Riverside County, California

Dear Dr. Keller:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE). The SLF search did indicate the presence of Native American cultural resources in the immediate project area.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes that may have knowledge of cultural resources in the project area. In particular, we recommend that you contact William Contreras at (760) 397-0300 and the other persons on the attached list of Native American contacts, may have knowledge as to whether or not the known cultural resources identified may be at-risk by the proposed project. The Commission makes no recommendation of a single individual or group over another. It is advisable to contact the person listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area (APE).

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. In fact, a Native American tribe may be the only source of information about a cultural resource. Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contact List

Native American Contacts
Riverside County
April 15, 2008

Cahuilla Band of Indians
Anthony Madrigal, Jr., Chairperson
P.O. Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
(951) 763-2631

(951) 763-2632 Fax

Augustine Band of Cahuilla Mission Indians
Mary Ann Green, Chairperson
P.O. Box 846 Cahuilla
Coachella , CA 92236
(760) 369-7171
760-369-7161

Los Coyotes Band of Mission Indians
Katherine Saubel, Spokesperson
P.O. Box 189 Cahuilla
Warner , CA 92086
loscoyotes@earthlink.net
(760) 782-0711
(760) 782-2701 - FAX

Morongo Band of Mission Indians
Michael Contreras, Cultural Resources-Project
49750 Seminole Drive Cahuilla
Cabazon , CA 92230 Serrano
(951) 755-5206

(951) 922-8146 Fax

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, vice chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Torres-Martinez Desert Cahuilla Indians
William Contreras, Cultural Resources Coordinator
P.O. Boxt 1160 Cahuilla
Thermal , CA 92274
cultural_monitor@yahoo.com
760) 397-0300
(760) 275-2686-CELL
(760) 397-8146 Fax

Santa Rosa Band of Mission Indians
John Marcus, Chairman
P.O. Box 609 Cahuilla
Hemet , CA 92546
srtribaloffice@aol.com
(951) 658-5311
(951) 658-6733 Fax

Agua Caliente Band of Cahuilla Indians THPO
Richard Begay, Tribal Historic Perservation Officer
5401 Dinah Shore Drive Cahuilla
Palm Springs , CA 92264
rbegay@aguacaliente.net
(760) 325-3400 Ext 6906
(760) 699-6906
(760) 699-6925- Fax

This list is current only as of the date of this document.

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

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed, Camp Ronald McDonald for Good Times Project locatedon Camp Roosevelt near Idyllwild, Riverside County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contacts
Riverside County
April 15, 2008

Cahuilla Band of Indians
Maurice Chacon, Cultural Resources
P.O. Box 391760 Cahuilla
Anza , CA 92539
cbandodian@aol.com
(951) 763-2631

(951) 763-2632 Fax

This list is current only as of the date of this document.

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

This list is only applicable for contacting local Native American with regard to cultural resources for the proposed, Camp Ronald McDonald for Good Times Project locatedon Camp Roosevelt near Idyllwild; Riverside County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Anthony Madrigal, Jr., Chairperson
Cahuilla Band of Indians
P.O. Box 391760
Anza, CA 92539

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Madrigal,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

A Sacred Lands File search indicated the presence of Native American cultural resources in the immediate project area. If you have additional information regarding the subject property or would like to comment on the proposed project, please contact me as soon as possible. Thank you for your consideration in this matter.

Sincerely,

Jean A. Keller

Attachment

1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Maurice Chacon, Cultural Resources
Cahuilla Band of Indians
P.O. Box 391760
Anza, CA 92539

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Chacon,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses $\pm$59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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Sincerely,

Jean A. Keller

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1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Joseph Hamilton, Vice Chairman
Ramona Band of Cahuilla Mission Indians
P.O. Box 391670
Anza, CA 92539

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Hamilton,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses $\pm$59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

John Marcus, Chairman
Santa Rosa Band of Mission Indians
P.O. Box 609
Hemet, CA 92546

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Marcus,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Michael Contreras
Cultural Resources Project
Morongo Band of Mission Indians
49750 Seminole Drive
Cabazon, CA 92230

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Contreras,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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Sincerely,

Jean A. Keller

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1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

William Contreras, Cultural Resources Coordinator
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160
Thermal, CA 92274

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Contreras,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Katherine Saubel, Spokesperson
Los Coyotes Band of Mission Indians
P.O. Box 189
Warner, CA 92086

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mrs. Saubel,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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Sincerely,

Jean A. Keller

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1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Richard Begay, Tribal Historic Preservation Officer
Agua Caliente Band of Cahuilla Indians THPO
5401 Dinah Shore Drive
Palm Springs, CA 92264

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Mr. Begay,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses ±59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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Sincerely,

Jean A. Keller

Attachment

1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

Jean A. Keller, Ph.D.
Cultural Resources Consultant

April 18, 2008

Mary Ann Green, Chairperson
Augustine Band of Cahuilla Mission Indians
P.O. Box 846
Coachella, CA 92236

Re: Camp Ronald McDonald for Good Times (APN 568-070-001, 002, 013, 024)

Dear Ms. Green,

This firm is currently conducting an update of the Phase I Cultural Resources Assessment completed in 1994 for the referenced project. As shown on the attached USGS Idyllwild, California topographic map, the subject property encompasses $\pm$59.0 acres of land located north and east of Hwy. 74, north and west of Apple Canyon Road, near Idyllwild in Riverside County (Section 4, Township 6 south, Range 3 east). The subject property has been used as Camp Roosevelt for many years and the proposed project is Camp Ronald McDonald for Good Times.

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Sincerely,

Jean A. Keller

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1042 N. El Camino Real, Suite B-244 – Encinitas, California 92024 – Telephone & Fax (760) 634-2993
jakeller@roadrunner.com

AGUA CALIENTE BAND OF CAHUILLA INDIANS

TRIBAL HISTORIC PRESERVATION

April 28, 2008

Jean A. Keller, Ph.D.
Cultural Resources Consultant
1042 N. El Camino Real, Suite B-244
Encinitas, CA 92024

RE: Records Check/Project Scoping for the Resurvey of Camp Ronald McDonald for Good Times, APN 568-070-001, -002, -013, -024, near Idyllwild Riverside County, CA

Dear Jean,

The Agua Caliente Band of Cahuilla Indians appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in your project. I have completed a records check of the Agua Caliente Cultural Register, and found no recorded cultural resources within your project area. We have no further concerns regarding this project.

Please send us a copy of the cultural resources inventory for this project. This letter shall conclude our consultation efforts. If you have questions or require additional information, please call me at 760-699-6906. You may also email me at rbegay@aguacaliente.net.

Cordially,

Richard M. Begay, THPO
Director of Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

C: Agua Caliente Cultural Register

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