Appendix E1 Biological Resources Report

Appendices

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Biological Technical Report for the Ontario Regional Sports Complex Project

San Bernardino County, California

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
°F	Degrees Fahrenheit
BOMP	Burrowing Owl Management Plan
CBR	Considered but Rejected
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNPSEI	California Native Plant Society's Electronic Inventory
CRPR	California Rare Plant Rank
CWA	Clean Water Act
EIR	Environmental Impact Report
ESA	Endangered Species Act
FR	Federal Register
GPS	Global Positioning System
HCP	Habitat Conservation Plan
MBTA	Migratory Bird Treaty Act
mph	Miles per hour
NEPA	National Environmental Policy Act
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
Procedures	State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SR	State Route
SSC	Species of Special Concern
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group
WOTUS	Waters of the U.S.

1.0 INTRODUCTION

ECORP Consulting, Inc. conducted a biological reconnaissance survey at an approximately 199-acre property (Assessor's Parcel Numbers 218-101-01, - 02, -03, -04, -05, -06, -07, and -08; 218-102-10 and -11; 218-111-04, -05, -06, -08, -09, -11, -12, -45, -49, and -50) and an approximately 1.5-mile-long north-south alignment associated with offsite improvements for water and sewer lines along Vineyard Avenue in the City of Ontario, San Bernardino County, California. The survey was conducted to identify any potential biological resources that could be affected by the proposed Ontario Regional Sports Complex Project (Project) pursuant to the terms of the California Environmental Quality Act (CEQA), and for the purposes of identifying any biological constraints that would affect the proposed site plan for the Project. The Project will be subject to county, state, and federal regulations regarding compliance with the federal Endangered Species Act (ESA), California ESA, Migratory Bird Treaty Act (MBTA), Clean Water Act (CWA) regulations, and California Fish and Game Code.

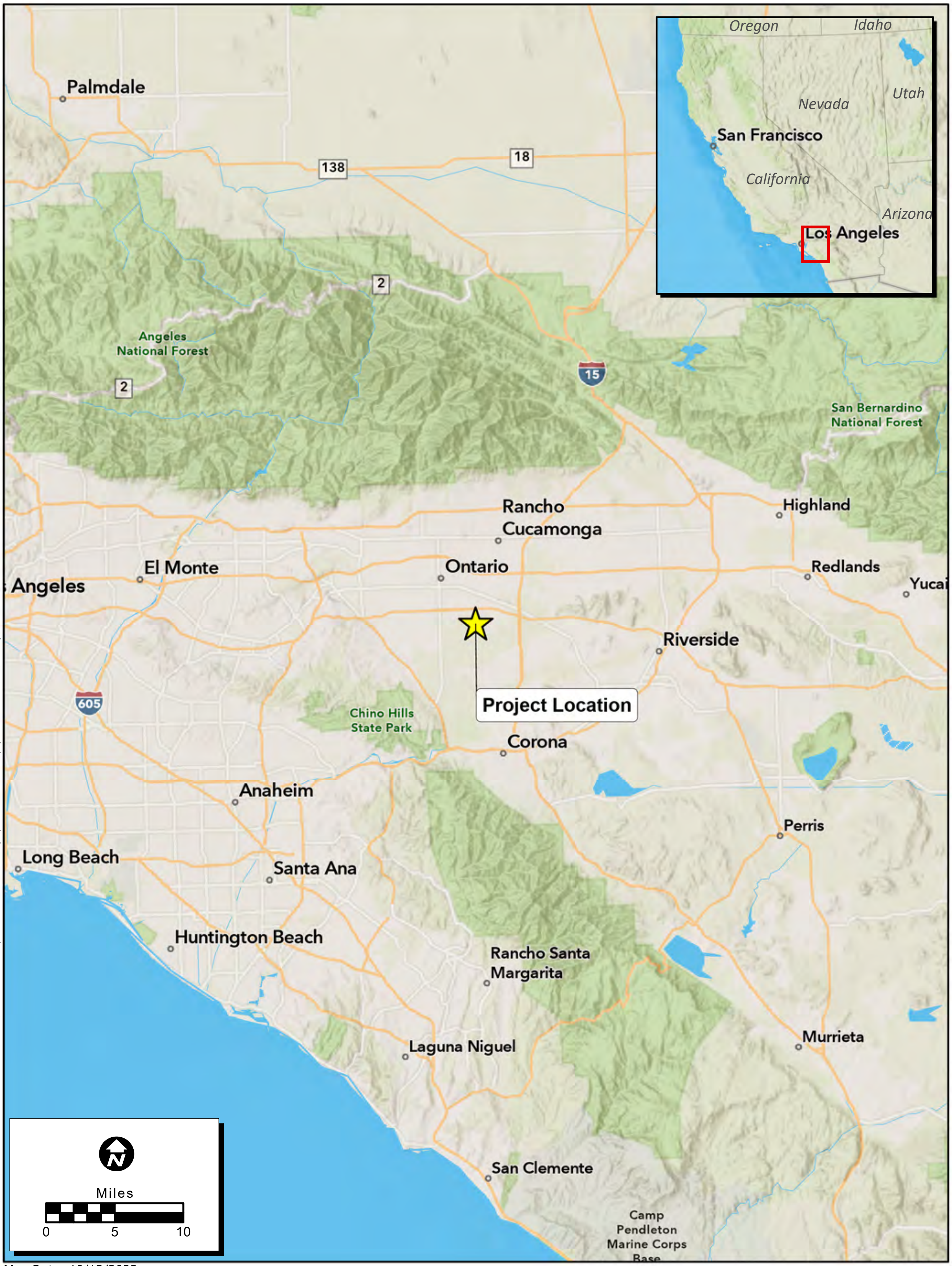
1.1 Project Description and Location

The Project proposes construction of an approximately 199-acre sports complex with associated mixture of uses and an approximately 1.5-mile-long alignment for offsite improvements. The Ontario Regional Sports Complex will include a semi-professional Minor League Baseball stadium, retail and hospitality areas, a new City of Ontario recreation and aquatics center, and fields for sports such as baseball, soccer, and softball. Additionally, the Project proposes offsite improvements for water and sewer lines, improvements to the existing Chino Avenue, and new road construction to extend Vineyard Avenue at the west end. For the purposes of this report, the Project Area refers to the approximately 199-acre property for the sports complex (Project site) and the approximately 1.5-mile-long alignment for offsite improvements for water and sewer lines (offsite improvement area).

The Project Area overlaps with Sections 3 and 10 of Township 2 South, Range 7 West and unsectioned Santa Ana Del Chino, San Bernardino Base and Meridian as depicted on the Guasti and Corona North, California, U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps. The Project Area is located west of Interstate (I-) 15, south of State Route (SR) 60, and east of SR-83 in the City of Ontario, California (Figures 1 and 2). The elevation of the Project Area ranges from approximately 683 to 780 feet above mean sea level.

2.0 FEDERAL, STATE, AND LOCAL REGULATIONS

This biological reconnaissance survey was conducted to identify potential biological resource constraints on the Project and ensure compliance with federal, state, and local regulations regarding listed, protected, and special-status species and resources. The regulations are detailed below.



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Map Date: 10/13/2023

Sources: ESRI

Figure 1. Project Vicinity

ECORP Consulting, Inc.
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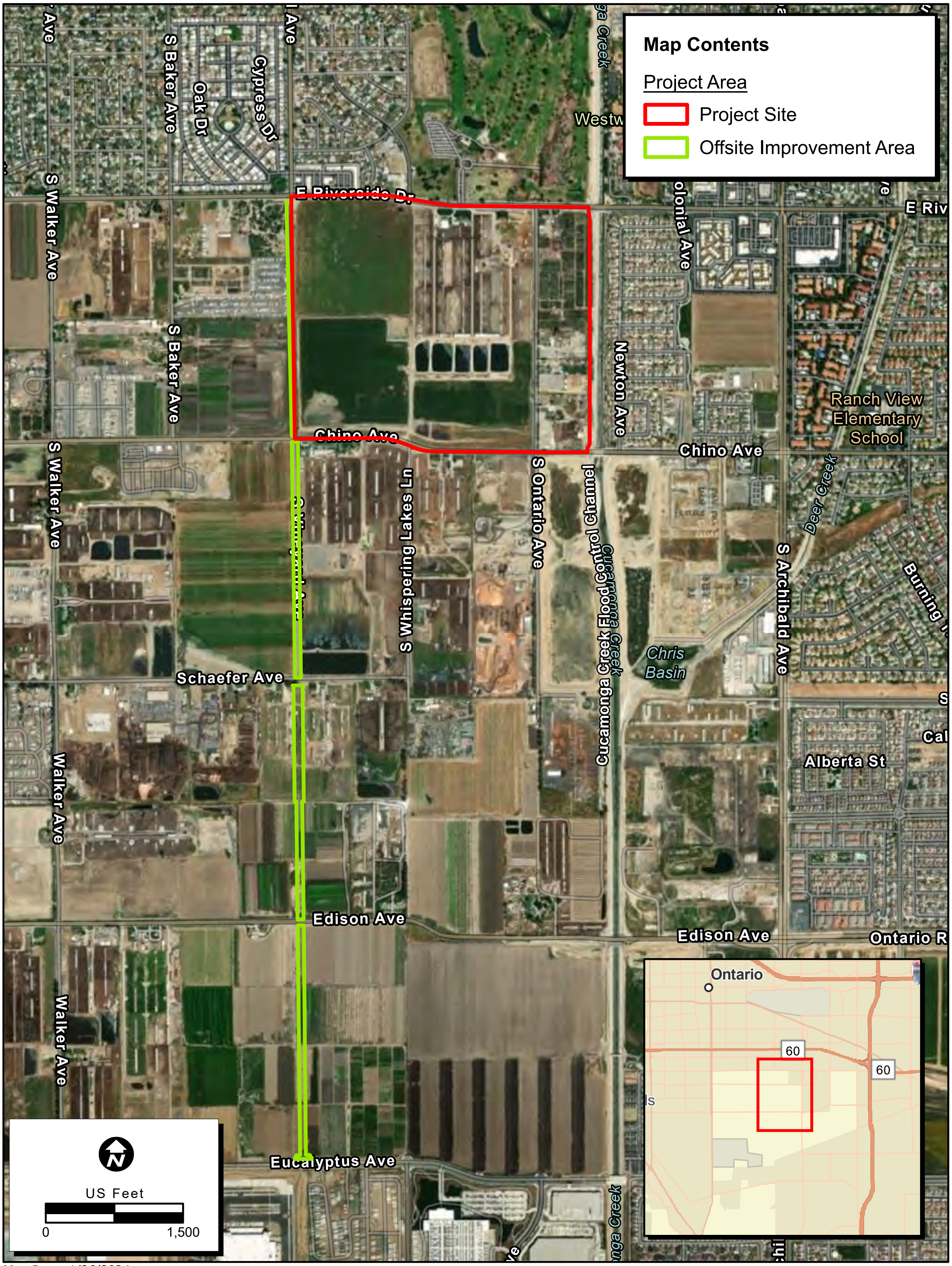
2023-177 Ontario Ball Park



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Map Date: 1/26/2024

Sources: Maxar (2023), Glenn Lukos Associates, Inc. (2015), City of Ontario (2016, 2017)

Figure 2. Project Location

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2023-177 Ontario Ball Park

2.1 Federal Regulations

2.1.1 The Federal Endangered Species Act

The federal ESA protects plants and animals that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service. Section 9 of the ESA prohibits the taking of endangered wildlife, where taking is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 Code of Federal Regulations [CFR] 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any endangered plant on federal land and removing, cutting, digging up, damaging, or destroying any endangered plant on non-federal land in knowing violation of state law (16 U.S. Code [USC] 1538).

Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed (or proposed) species (including plants) or its critical habitat. Through consultation and the issuance of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to an otherwise authorized activity provided the activity will not jeopardize the continued existence of the species. Section 10 of the ESA provides for issuance of incidental take permits where no other federal actions are necessary provided a habitat conservation plan is developed.

2.1.2 Migratory Bird Treaty Act

The MBTA implements international treaties between the U.S. and other nations devised to protect migratory birds, any of their parts, eggs, and nests from activities including hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, education, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The regulations governing migratory bird permits can be found in 50 CFR Part 13 General Permit Procedures and 50 CFR Part 21 Migratory Bird Permits.

2.1.3 Federal Clean Water Act

Under Section 404 of the federal CWA, potential Waters of the U.S., including wetlands, may be regulated by the U.S. Army Corps of Engineers (USACE). The limit of USACE jurisdiction for non-tidal watercourses (without adjacent wetlands) is defined in 33 CFR 328.4(c)(1) as the "ordinary high-water mark" (OHWM).

The OHWM is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas. The upstream limits of other waters are defined as the point where the OHWM is no longer perceptible.

Jurisdictional Waters of the U.S. (WOTUS) are delineated in accordance with the "Revised Definition of 'Waters of the United States'" rule, published in the Federal Register (FR) in 2022 and which became final on January 18, 2023. This rule, set forth by the U.S. Environmental Protection Agency (USEPA) and USACE, was consistent with the pre-2015 regulatory definition as all waters that are currently used, or were used in the past, or may be susceptible to use in interstate commerce, including all waters subject to the ebb and flow of the tide. This definition also includes all interstate waters, including interstate wetlands, interstate lakes, rivers, streams (including all intermittent and ephemeral streams), mudflats, sand flats, sloughs, and prairie potholes, wet meadows, playa lakes, or natural ponds where the use, degradation, or destruction of which could affect interstate or foreign commerce. Under this rule, WOTUS do not include prior converted cropland.

The definition of WOTUS in accordance with this rule (40 CFR 230.3[s]), is summarized below.

"1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: (i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or (ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (iii) Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the U.S. under the definition;

5. Tributaries of waters identified in paragraphs (s)(1)-(4) of this section;

6. The territorial sea; and

7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not WOTUS."

On May 25, 2023, the U.S. Supreme Court adopted a narrower definition of WOTUS in the case *Sackett v. Environmental Protection Agency*. Under the majority opinion, WOTUS refers to "geographical features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes' and to adjacent wetlands that are 'indistinguishable' from those bodies of water due to a continuous surface connection." On August 29, 2023, the agencies issued a final rule to amend the final "Revised Definition of 'Waters of the United States'" rule to conform the definition of "waters of the United States" to the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency*.

Parts of the January 2023 Rule are invalid under the U.S. Supreme Court's interpretation of the CWA in the *Sackett* decision. Therefore, the agencies have amended key aspects of the regulatory text to conform to the Court's decision. Key changes under the amendment include:

- Definition of "adjacent" is now "having a continuous surface connection;"
- Only tributaries that are relatively permanent, standing or continuously flowing bodies of water (or tributaries with a continuous surface connection to those) are considered jurisdictional;
- Interstate wetlands are no longer jurisdictional just by virtue of being interstate; and
- Significant nexus test is eliminated.

Where areas jurisdictional to the USACE are present, and will be impacted by a project, the project proponent must usually apply for permitting with the agency, which generally consists of submittal of a Pre-Construction Notification under Section 404 of the CWA. As of the writing of this report, we do not know the details of how the individual USACE offices will implement the conforming rule for permitting purposes.

2.2 State and Local Regulations

2.2.1 California Endangered Species Act

The California ESA generally parallels the main provisions of the ESA but, unlike its federal counterpart, the California ESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California ESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with California Department of Fish and Wildlife (CDFW) to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

2.2.2 Fully Protected Species

The State of California first began to designate species as *fully protected* prior to the creation of the federal and California ESAs. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibians, reptiles, birds, and mammals. Most fully protected species have since been listed as threatened or endangered under the federal and/or California ESA. Previously, the regulations that implement the Fully Protected Species Statute (California Fish and Game Code § 4700) provide that fully protected species may not be taken or possessed at any time. However, as of July 10, 2023 Senate Bill 147 (SB147) was signed into law, authorizing CDFW to issue take permits under the California ESA for fully protected species for qualifying projects through 2033. As stated in section 2081.15 of SB147, qualifying projects include:

- A maintenance, repair, or improvement project to the State Water Project, including existing infrastructure, undertaken by the Department of Water Resources;
- A maintenance, repair, or improvement project to critical regional or local water agency infrastructure;
- A transportation project, including any associated habitat connectivity and wildlife crossing project, undertaken by a state, regional, or local agency, that does not increase highway or street capacity for automobile or truck travel;
- A wind project and any appurtenant infrastructure improvement, and any associated electric transmission project carrying electric power from a facility that is located in the state to a point of junction with any California based balancing authority; and
- A solar photovoltaic project and any appurtenant infrastructure improvement, and any associated electric transmission project carrying electric power from a facility that is located in the state to a point of junction with any California-based balancing authority.

2.2.3 California Fish and Game Code

2.2.3.1 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (California Fish and Game Code §§ 1900-1913) was created with the intent to *preserve, protect and enhance rare and endangered plants in this State*. The NPPA is administered by CDFW. The California Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California ESA of 1984 (California Fish and Game Code § 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of the California Fish and Game Code.

2.2.3.2 Streambed Alteration Agreement

Pursuant to Section 1602 of the California Fish and Game Code, a Streambed Alteration Agreement (SAA) application must be submitted for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake" (CDFW 2021). In Title 14 of the California Code of Regulations (CCR), Section 1.72, the CDFW defines a *stream* (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

In Chapter 9, Section 2785 of the Fish and Game Code, *riparian habitat* is defined as "lands which contain habitat which grows close to, and which depends upon, soil moisture from a nearby freshwater source."

The CDFW's jurisdiction includes drainages with a definable bed, bank, or channel and areas associated with a drainage channel that support intermittent, perennial, or subsurface flows; supports fish or other aquatic life; or supports riparian or hydrophytic vegetation. It also includes areas that have a hydrologic source.

The CDFW will determine if the proposed actions will result in diversion, obstruction, or change of the natural flow, bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. If warranted, the CDFW will issue an SAA that includes measures to protect affected fish and wildlife resources; this SAA is the final proposal agreed upon by the CDFW and the applicant.

2.2.3.3 Migratory Birds

The CDFW enforces the protection of nongame native birds in §§ 3503, 3503.5, and 3800 of the California Fish and Game Code. Section 3513 of the California Fish and Game Code prohibits the possession or take of birds listed under the MBTA. These sections mandate the protection of California nongame native birds' nests and also make it unlawful to take these birds. All raptor species are also protected from "take" pursuant to California Fish and Game Code § 3503.5 and are also protected at the federal level by the MBTA of 1918 (USFWS 1918).

2.2.3.4 Bats and Bat Roosts

Bats in California are currently protected directly and indirectly by the California Fish and Game Code, Sections 86, 1600, 2000, 2014, 3007, and 4150; California Public Resources Code, Division 14, Section 21000 et seq.; and CCR, Title 14 including, but not limited to Section 251.1, CEQA regulations (Section 15000 et seq.), and Section 15382 – Significant Effect on the Environment.

Regulations of particular relevance to the protection of bats and bat roosts include Title 14, Section 251.1 of the CCR, which prohibits harassment (defined in that section as an intentional act that disrupts an animal's normal behavior patterns, including breeding, feeding, or sheltering) of nongame mammals (e.g., bats), and California Fish and Game Code Section 4150, which prohibits *take* or possession of all nongame mammals or parts thereof. Any activities resulting in bat mortality (e.g., the destruction of an occupied bat roost that results in the death of bats), disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), or various modes of nonlethal pursuit or capture may be considered *take* as defined in Section 86 of the California Fish and Game Code. In addition, impacts to bat maternity colonies, which are considered native wildlife nursery sites, could be considered significant under CEQA.

2.2.4 Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act requires "any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the State to file a report of discharge" with the Regional Water Quality Control Board (RWQCB) through State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures) (CCR, title 23, § 3855; State Water Resources Control Board 2021). *Waters of the State* is defined as any surface water or groundwater, including saline waters, within the boundaries of the State (California Water Code § 13050[e]). Pollution is defined as an alteration of the quality of the waters of the state by waste to a degree that unreasonably affects its beneficial uses (California Water Code § 13050) and includes filling in waters of the State. Note that CCR, title 23, § 3855 applies only to individual water quality certifications, but the new Procedures extend the application of § 3855 to individual waste discharge requirements for discharges of dredged or fill material to Waters of the State and waivers thereof.

A permit for impacts to Waters of the State of California would likely be required under the CWA and/or Porter-Cologne Water Quality Control Act. To determine whether a project should be regulated pursuant to the Porter-Cologne Water Quality Control Act, the RWQCB considers whether project activities could impact the quality of Waters of the State.

On September 27, 2023, the USEPA published its final 2023 Clean Water Act Section 401 Quarter Quality Certification Improvement Rule (88 FR 66558.) The final 2023 Rule revises and replaces the 2020 Rule's regulatory requirements for water quality certification that were adopted by the prior federal administration. The updates realign the scope of the Section 401 certification process with established practices, while also restoring the roles of states, territories, and authorized Tribes as certifying agencies.

2.2.5 San Bernardino County Biotic Resources Overlay

The San Bernardino County Biotic Resources Overlay was established by the Land Use Plan and Land Use Zoning Districts (§§ 82.01.020) and the Overlays (§§ 82.01.0230) of the County of San Bernardino. The purpose of the Biotic Resources Overlay is to implement General Plan policies regarding the "protection and conservation of beneficial rare and endangered plants and animal resources and their habitats" (San Bernardino County 2023). Projects within the County of San Bernardino are required to address the biological resources that appear within the Biotic Resources Overlay and overlap with their project site. Further, project proponents must identify mitigation measures that will reduce or eliminate impacts to the identified resources.

2.2.6 California Environmental Quality Act Significance Criteria

Section 15064.7 of the CEQA Guidelines encourages local agencies to develop and publish the thresholds the agency uses in determining the significance of environmental effects caused by projects under its review. However, agencies may also rely upon the guidance provided by the CEQA checklist contained in Appendix G of the CEQA Guidelines. Appendix G provides examples of impacts that would normally be considered significant. Based on these examples, impacts to biological resources would normally be considered significant if a project would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;

- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and
- conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan, or other approved local, regional, or state HCP.

An evaluation of whether an impact on biological resources would be substantial must consider both the resource itself and how that resource fits into a regional or local context. Substantial impacts would be those that would diminish, or result in the loss of, an important biological resource, or those that would obviously conflict with local, state, or federal resource conservation plans, goals, or regulations. Impacts are sometimes locally important but not significant according to CEQA. The reason for this is that although the impacts would result in an adverse alteration of existing conditions, they would not substantially diminish, or result in the permanent loss of an important resource on a population-wide or region-wide basis.

2.2.7 City of Ontario

2.2.7.1 Tree Preservation Policy and Protection Measures

As a part of the City of Ontario's Development Code, §§6.05.020 outlines the protection of heritage trees under its Tree Preservation Policy and Protection Measures.

The Tree Preservation Policy and Protection Measures are in place to ensure the protection, preservation, and maintenance of established and healthy heritage trees. A heritage tree is "a tree designated for preservation pursuant to Section 4.02.010 (Historic Preservation—Historic Landmark and District Designations, and Architectural Conservation Areas) of the Development Code, a tree of historic or cultural significance, or a tree of importance to the community due to one of the following factors:

- It is one of the largest or oldest trees of the species located in the City, with a trunk diameter of 18 inches or greater, measured at 54 inches above natural grade; or
- It has historical significance due to an association with an historic building, site, street, person, or event; or
- It is a defining landmark or significant outstanding feature of a neighborhood or district, or typical of early Ontario landscapes, including [i] *Cinnamomum camphora* (Camphor Tree), [ii] *Cedrus deodara* (Deodar Cedar), [iii] *Platanus acerifolia* (London planetree), [iv] *Quercus suber* (Cork Oak), [v] *Quercus ilex* (Holly Oak), or [vi] *Schinus molle* (California Pepper); or

It is a Native Tree. The term "Native Tree" means any one of the following California native tree species, which has a trunk diameter of more than 8 inches, measured at 54 inches above natural grade, including [i] *Platanus racemosa* (California Sycamore), [ii] *Pinus torreyana* (Torrey Pine), [iii] *Quercus agrifolia* (Coast Live Oak), [iv] *Quercus engelmannii* (Engelmann Oak), [v] *Quercus lobata* (Valley Oak), or [vi] *Umbellularia californica* (California Bay)" (City of Ontario 2020).

2.2.7.2 *Memorandum of Agreement for Burrowing Owl and Delhi Sands Flower-Loving Fly*

On November 21, 2023, a memorandum of agreement (MOA) became effective between the City of Ontario and the Inland Empire Resource Conservation District (IERCD) (City of Ontario 2024). This MOA aids in the implementation of a Habitat Mitigation Fee as well as the requirements and mitigation measures set forth in the Greater Prado Basin Habitat Conservation Program (GPBHCP). The mitigation measures in the GPBHCP are aimed at reducing potential impacts to sensitive wildlife species, including burrowing owl (*Athene cunicularia*), Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), raptor foraging and wildlife habitat, and other sensitive (listed and non-listed species), within Ontario Ranch, the area in which the Project Area is located. The Ontario Ranch, or Annexation Area 163, consists of 8,200 acres of land within the City of Ontario.

The Habitat Mitigation Fee is $2,000 per net acre with funds used for the acquisition, restoration, rehabilitation, and maintenance of lands determined to have long-term conservation value for the aforementioned species and their habitat.

With respect to burrowing owl and Delhi Sands flower-loving fly, this MOA ensures:

- A mitigation fee will be applied to development projects within Ontario Ranch that will impact burrowing owls or their habitat;
- The City of Ontario will identify lands occupied by burrowing owl or Delhi Sands flower-loving fly and suitable long-term habitat for these species to be avoided and maintained;
- In the case of burrowing owls being present on proposed development sites that are not viable long-term habitat, developers can pay the Habitat Mitigation Fee and relocate the owls in consultation with the California Department of Fish and Wildlife; and
- Up to 25% of the Habitat Mitigation Fee collected for burrowing owls can be used for the recovery of the Delhi Sands flower-loving fly.

3.0 METHODS

3.1 Literature Review

Prior to conducting the biological reconnaissance survey, ECORP biologists performed a literature review using the CDFW's California Natural Diversity Database (CNDDB; CDFW 2023a) and the California Native Plant Society's (CNPS) Electronic Inventory (CNPSEI; CNPS 2023) to determine the special-status plant and wildlife species that have been documented near the Project Area. ECORP searched CNDDB and CNPSEI records within the Project Area boundaries as depicted on USGS 7.5-minute Guasti and Corona North topographic quadrangles, plus the surrounding ten topographic quadrangles including Mount Baldy, Cucamonga Peak, Devore, Fontana, Riverside West, Lake Mathews, Corona South, Black Star Canyon, Prado Dam, and Ontario. The CNDDB and CNPSEI contain records of reported occurrences of federally and/or state-listed endangered, threatened, proposed endangered or threatened species, California

Species of Special Concern (SSC), or other special-status species or habitat that may occur within or near the Project. Additional information was gathered from the following sources and includes, but is not limited to:

- *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2023b);
- *Special Animals List* (CDFW 2023c);
- *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012);
- *The Manual of California Vegetation*, 2^{nd} Edition (Sawyer et al. 2009);
- Countywide – All Biotic Resources Overlay Map (San Bernardino County 2012);
- National Wetlands Inventory (NWI; USFWS 2023a)
- Biological Technical Report for Portions of the Armstrong Ranch Specific Plan, Tentative Tract 19966 (CVRC Ontario Investment, LLC Properties and Off-site Improvement Lands; Glenn Lukos Associates, Inc. 2015a);
- Armstrong Ranch Environmental Impact Report (City of Ontario 2016, 2017); and
- various online websites (e.g., Calflora 2023).

Using this information and observations in the field, a list of special-status plant and wildlife species that have the potential to occur on or near the Project Area was generated. For the purposes of this assessment, special-status species are defined as plants or animals that:

- have been designated as either rare, threatened, or endangered by CDFW, CNPS, or the USFWS, or are protected under either the federal ESA or California ESA;
- are candidate species being considered or proposed for listing under these same acts;
- are fully protected by the California Fish and Game Code, §§ 3511, 4700, 5050, or 5515; or
- are of expressed concern to resource and regulatory agencies or local jurisdictions.

Special-status species reported for the region in the literature review or for which suitable habitat occurs on the site were assessed for their potential to occur within the Project Area based on the following guidelines:

- **Present:** The species was observed onsite during a site visit or focused survey.
- **High:** Habitat (including soils and elevation factors) for the species occurs within the Project Area and a known occurrence has recently been recorded (within the last 20 years) within 5 miles of the area.
- **Moderate:** Habitat (including soils and elevation factors) for the species occurs within the Project Area and a documented observation occurs within the database search, but not within 5 miles of the area; or a recently documented observation occurs within 5 miles of the area and marginal or limited amounts of habitat occurs in the Project Area.

- **Low:** Limited or marginal habitat for the species occurs within the Project Area and a recently documented observation occurs within the database search, but not within five miles of the area; a historic documented observation (more than 20 years old) was recorded within 5 miles of the Project Area; or suitable habitat strongly associated with the species occurs on site, but no records or only historic records were found within the database search.
- **Presumed Absent:** Species was not observed during a site visit or focused surveys conducted in accordance with protocol guidelines at an appropriate time for identification; habitat (including soils and elevation factors) does not exist onsite; or the known geographic range of the species does not include the Project Area.

Note that location information on some special-status species may be of questionable accuracy or unavailable. Therefore, for survey purposes, the environmental factors associated with a species' occurrence requirements may be considered sufficient reasons to give a species a positive potential for occurrence. In addition, just because a record of a species does not exist in the databases does not mean it does not occur. In many cases, records may not be present in the databases because an area has not been surveyed for that species.

A review of the Natural Resources Conservation Service (NRCS; NRCS 2023a) Web Soil Survey, NRCS Hydric Soils List (NRCS 2023b), National Wetlands Inventory (USFWS 2023a), and the corresponding USGS topographic maps was also conducted to determine if there were any blue line streams or drainages present on the Project Area that potentially fall under the jurisdiction of either federal or state agencies.

3.1.1 The Armstrong Ranch Specific Plan

Portions of the current Project boundaries overlap with the boundaries for the previously considered Armstrong Ranch Specific Plan. The Armstrong Ranch Specific Plan was a proposed residential community, including a school, and offsite improvements totaling approximately 206.5 acres within the City of Ontario. Two biological reports (Glenn Lukos Associates, Inc. 2015a, 2015b) and an Environmental Impact Report (EIR; City of Ontario 2016, 2017) were prepared in support of the Armstrong Ranch Specific Plan. Incidentally, a portion of the current Project Area overlaps with the previously assessed areas within the Armstrong Ranch Specific plan. Due to the partial overlap of the current Project Area boundaries with the Armstrong Ranch Specific Plan boundaries, the results of previous reports prepared for the Armstrong Ranch Specific Plan have been referenced, where appropriate, in relation to survey results documented for the current Project.

3.2 Field Survey

3.2.1 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted by walking the entire Project Area and a 500-foot buffer, where accessible, to determine the vegetation communities and wildlife habitats present on the site. Areas that were not accessible by foot were scanned using binoculars for suitable habitat. The biologists documented the plant and wildlife species present on the Project Area, and the location and condition of the Project Area were assessed for the potential to provide habitat for special-status plant and wildlife species. Additionally, the biologists documented features within the Project Area with the potential to be jurisdictional to the USACE, RWQCB, and/or CDFW. Data were recorded in the field utilizing ArcGIS™ Field Maps on a device (smartphone or tablet) connected to a Global Positioning System (GPS) unit, field notebooks, or maps. Photographs were also taken during the survey to provide visual representation of the conditions within the Project Area. The Project Area was also examined to assess its potential to facilitate wildlife movement or function as a movement corridor for wildlife moving throughout the region. The biologists also documented the vegetation communities present on the Project Area.

Plant and wildlife species, including any special-status species that were observed during the survey, were recorded. Plant nomenclature follows that of *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012). Wildlife nomenclature follows Society for the Study of Amphibians and Reptiles (2017), *Check-list of North American Birds* (Chesser et al. 2023), and the *Revised Checklist of North American Mammals North of Mexico* (Bradley et al. 2014). In instances where a special-status species was observed, the date, species, location and habitat, and GPS coordinates were recorded.

A bat habitat assessment of structures and trees that were accessible within the Project Area was also conducted during the biological reconnaissance survey. The interior and exterior of unoccupied buildings were examined for bat roosting habitat and bat sign, where accessible. Inaccessible areas where additional follow-up assessments are recommended were noted (e.g., bridges over the Cucamonga Creek Flood Control Channel). During the assessment, potential roosting structures where follow-up nighttime emergence and/or acoustic surveys are recommended were documented.

4.0 RESULTS

Summarized below are the results of the literature review and field surveys, including site characteristics, vegetation communities, wildlife, special-status species, and special-status habitats (including any potential wildlife corridors).

4.1 Literature Review

4.1.1 Special-Status Plants and Wildlife

The literature review and database searches identified 63 special-status plant species and 49 special-status wildlife species that have been previously documented near the Project Area. A list was generated from the results of the literature review and the Project Area was evaluated for suitable habitat that could support any of the special-status plant or wildlife species on the list. Additionally, the Project Area is located within the San Bernardino County Biotic Resources Overlay for Delhi Sands flower-loving fly (and burrowing owl (County of San Bernardino 2012).

4.1.2 U.S. Fish and Wildlife Service Designated Critical Habitat

The Project Area is not located within any USFWS-designated Critical Habitat (USFWS 2023b). Designated Critical Habitat for Southwestern willow flycatcher (*Empidonax traillii extimus*) and least Bell's vireo (*Vireo* *bellii pusillus*) is present approximately 4.5 miles south of the Project Area. There are no expected impacts to the Critical Habitat because there is no critical habitat on or adjacent to the Project Area.

4.1.3 Aquatic Resources

The NWI (USFWS 2023a) mapped multiple aquatic resources within the Project Area consisting of freshwater ponds and freshwater emergent wetlands (Figure 3). Within the Project Area, the freshwater ponds have five classifications under the NWI: PUSAx (freshwater pond, palustrine, unconsolidated shore, temporary flooded, excavated); PUSCx (freshwater pond, palustrine, unconsolidated shore, seasonally flooded, excavated); and PABFx (freshwater pond, palustrine, aquatic bed, semi-permanently flooded, excavated). The freshwater emergent wetlands have two classifications: PEM1Cx (freshwater emergent wetland, palustrine, emergent, persistent, seasonally flooded, excavated) and PEM1Ax (freshwater emergent wetland, palustrine, emergent, persistent, temporary flooded, excavated). Additionally, the desktop review of the NRCS identified one hydric soil type on the site: Delhi fine sand (NRCS 2023a, 2023b; Figure 4). According to the NRCS, Delhi sands are only potentially hydric where depressional features occur.

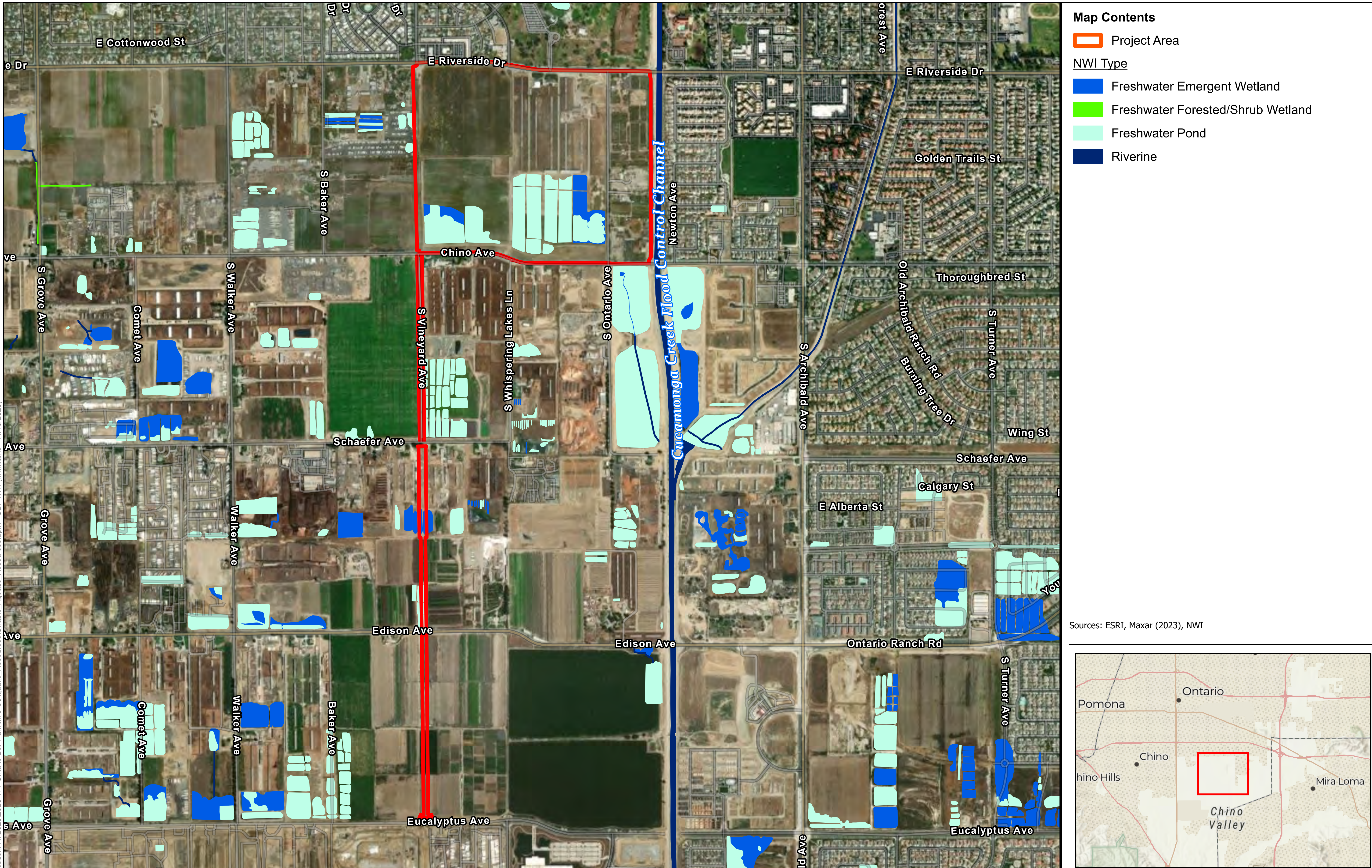
4.2 Biological Reconnaissance Survey

The biological reconnaissance survey was conducted within the entire Project Area and a 500-foot buffer, where accessible, on September 26, 2023, by ECORP biologists Lauren Simpson and Corrina Tapia. Summarized below are the results of the biological reconnaissance survey including site characteristics, plant communities present, wildlife observed, special-status species observed, and special-status habitats present (including any potential wildlife corridors). Weather conditions during the survey are summarized in Table 1.

Table 1. Weather Conditions During the Survey

Date	Time		Temperature (˚F)		Cloud Cover (%)		Wind Speed (mph)	
	Start	End	Min	Max	Min	Max	Min	Max
9/26/23	0730	1445	61.6	88.3	0	0	0.7-2.0	2.5-4.0

Note: °F = Degrees Fahrenheit; mph = miles per Hour



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Aquatic_Resources\Ontario_Aquatic_Resources.aprx - OBP NWI (mwilliams - 11/10/2023)

Map Date: 11/10/2023

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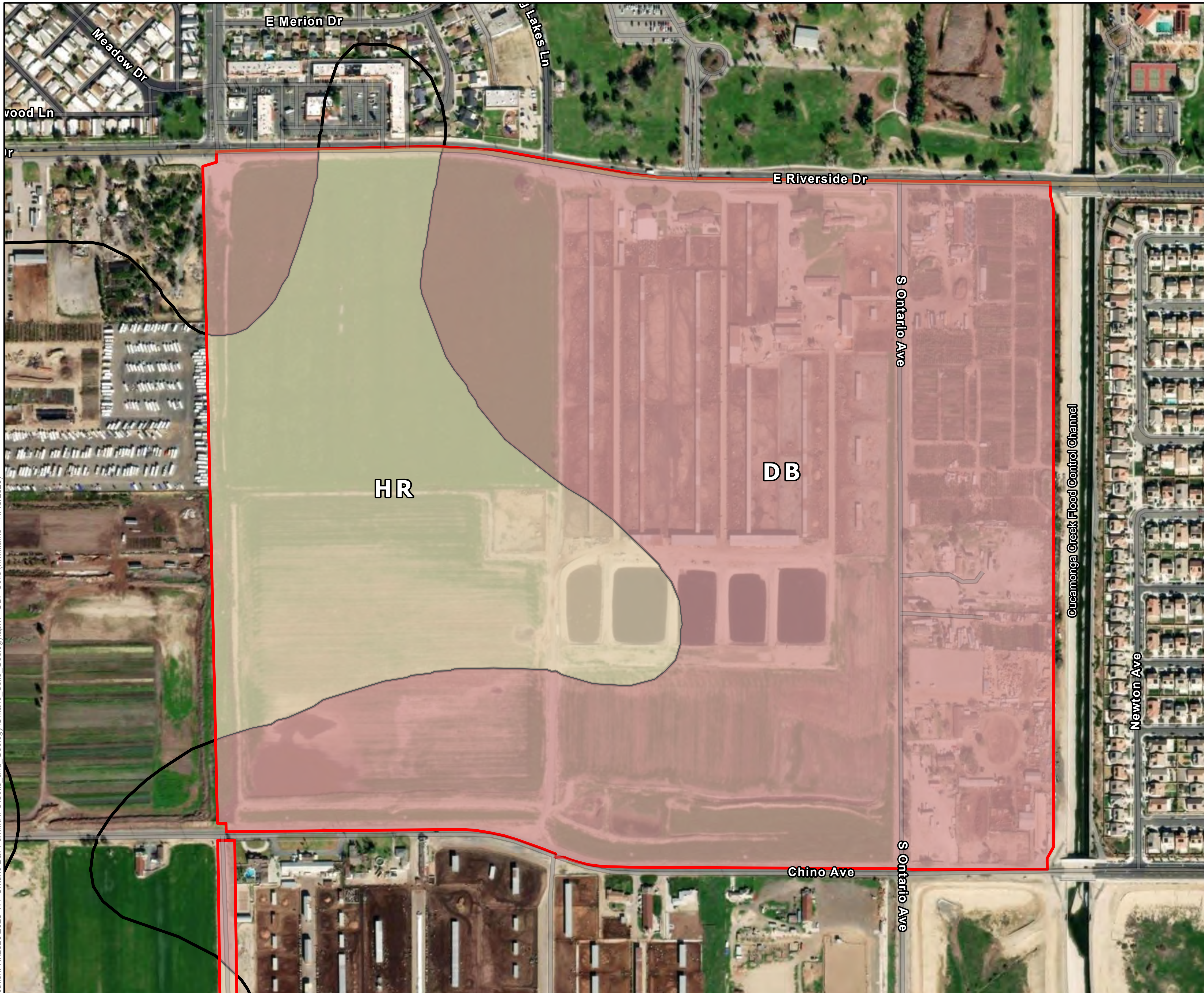
Scale in Feet
0 1,250

E1-20

Figure 3. National Wetlands Inventory

2023-177 Ontario Ball Park



Map Contents

Project Area

Series Designation - Series Description

Db - Delhi fine sand

Hr - Hilmar loamy fine sand

Sources: ESRI, Diversified Pacific, San Bernardino County

Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Soils_and_Geology\Ontario_Soils_Geology.aprx - OBP Soils (mwilliams - 11/15/2023)

Map Date: 11/15/2023

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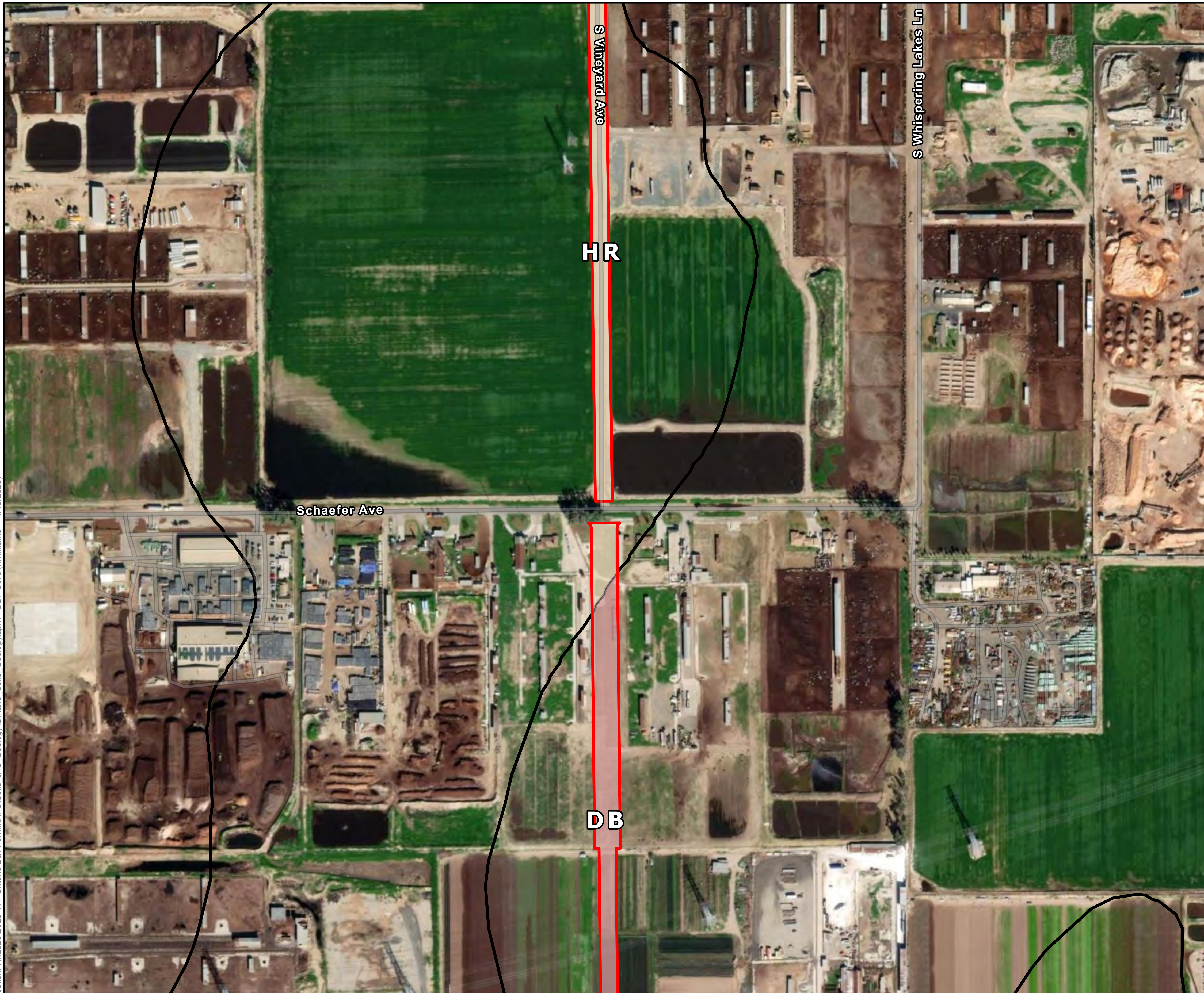
Scale in Feet
0 400

E1-21

Figure 4. Natural Resources Conservation Service Soil Types
Sheet 1 of 3
2023-177 Ontario Ball Park



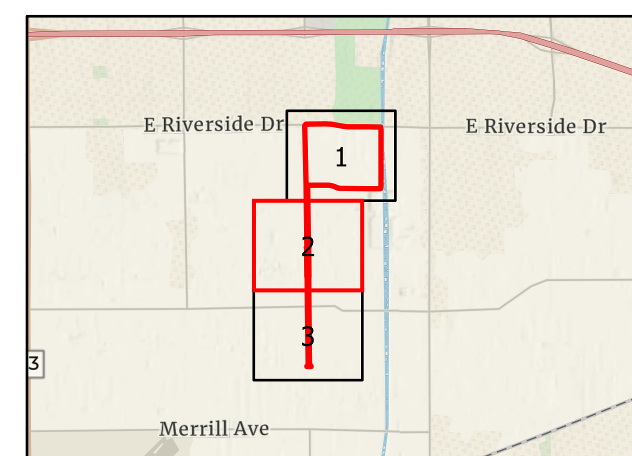
Map Contents

Series Designation - Series Description

Db - Delhi fine sand

Hr - Hilmar loamy fine sand

Sources: ESRI, Diversified Pacific, San Bernardino County



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Map Date: 11/15/2023

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Scale in Feet

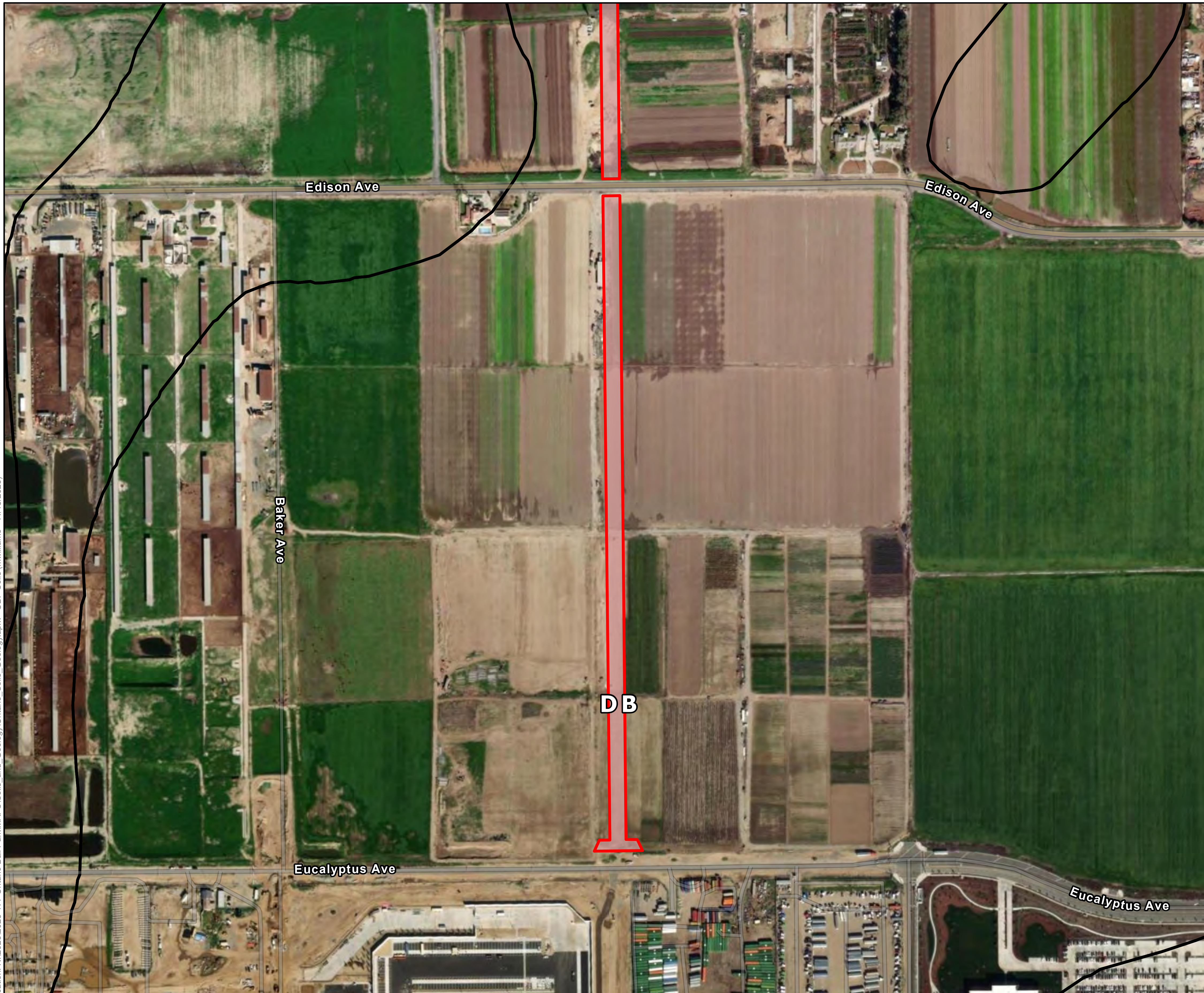
0 400

E1-22

Figure 4. Natural Resources Conservation Service Soil Types

Sheet 2 of 3

2023-177 Ontario Ball Park

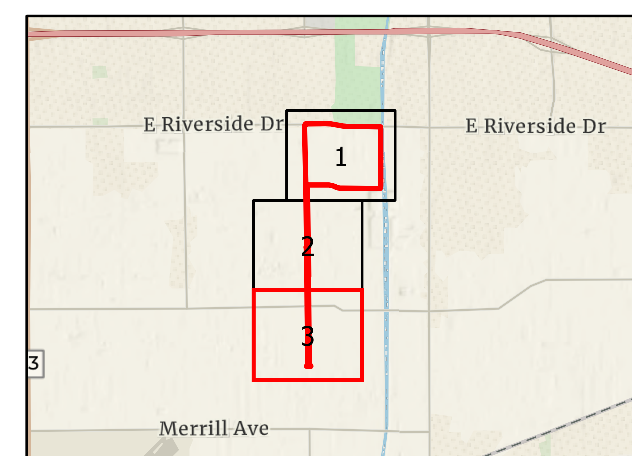


Map Contents

Series Designation - Series Description

Db - Delhi fine sand

Sources: ESRI, Diversified Pacific, San Bernardino County



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Map Date: 11/15/2023

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Scale in Feet
0 400

E1-23

Figure 4. Natural Resources Conservation Service Soil Types
Sheet 3 of 3
2023-177 Ontario Ball Park

4.2.1 Property Characteristics

The Project Area consists of an active dairy farm operation, active and seasonal agricultural lands, and developed areas (i.e., roads, plant nursery, storage yards, and rural residential homes). Specifically, the active dairy farm is located in the northeast corner of the Project Area; corn fields, waste management basins, and disturbed lands are present in the southeast corner of the Project Area; corn fields are present in the southwest corner; and seasonal agriculture is present in the northwest corner. Active and seasonal agricultural lands are located along the offsite improvement areas along Vineyard Avenue to the south. At the time of the survey, active agriculture included dairy operations and farming (e.g., corn fields). Rural residential homes were scattered throughout the Project Area, and present primarily east of the active dairy farm (east of Ontario Avenue). Also east of Ontario Avenue is a plant nursery and various storage yards. Due to the location of the Project Area in developed and agricultural areas, anthropogenic disturbances are present throughout the Project Area in the form of compacted or disturbed soils (e.g., signs of previous discing and manure within cattle areas), fallow fields, active agriculture and dairy farms, trash, and vehicle tracks.

The Project Area contains scattered tree species such as eucalyptus (*Eucalyptus* sp.) and Peruvian pepper tree (*Schinus mole*) as well as other ornamental shrubs and trees (e.g., olive tree [*Olea europaea*] and hardy ice plant [*Delosperma cooperi*]). At the time of the survey, five waste management basins located in the Project site were full of water, fed from the nearby active dairy operation. Waste management basins are present throughout the Project Area; however, at the time of the survey, only those near the active dairy operation had water present. Signs of past water pooling were evident at other waste management basins (e.g., cracked soils, mesic vegetation) at the time of the survey. Debris piles are present throughout the Project Area. Abandoned buildings that appeared to serve as prior living quarters and buildings utilized for dairy operations are present within the northeast portion of the Project site.

General surrounding land uses to the Project Area consist of Whispering Lakes Golf Course and commercial development to the north, residential development to the east, agriculture and dairy farm operations to the south, and commercial development and undeveloped land to the west. Representative photographs of the Project Area are presented in Appendix A.

4.2.2 Vegetation Communities and Land Cover Types

The Project Area is located within a developed environment that is generally subjected to repeated and ongoing disturbance from human activities. No native vegetation communities falling into the classifications in Sawyer et al. (2009) were documented within the Project Area, which is consistent with previous biological reports prepared for the Armstrong Ranch Specific Plan (Glenn Lukos Associates, Inc. 2015a, City of Ontario 2016). The land cover types present within the Project Area are classified as Disturbed, Agriculture, Developed, and Open Water (Figure 5). These land cover types, as they exist within the Project Area, are described below and the acreages of each are provided in Table 2.

North of Edison Avenue, within the offsite improvement area, one to two individuals of mulefat (*Baccharis salicifolia*) and two to three individuals of black willow (*Salix gooddingii*) were present within a small, waste management basin. These individuals were clustered together along the southeastern ledge of the basin. Other plant species included in this area included peregrine saltbush (*Atriplex suberecta*), tree tobacco

(*Nicotiana glauca*), and golden crownbeard (*Verbesina encelioides*). Although these individuals of mulefat and black willow are present within the Project Area, due to their small size and sparse nature, these individuals were not large or established enough to be mapped as a vegetation community.

Table 2. Land Cover Acreages within the Project Area

Land Cover Type	Project Area	
	Acreages within Project Site	Acreages within Offsite Improvement Area
Agriculture	120.13	8.84
Developed	48.60	3.81
Disturbed	25.02	2.55
Open Water	5.26	0.00
Total	199.01	15.20
Grand Total	214.21	

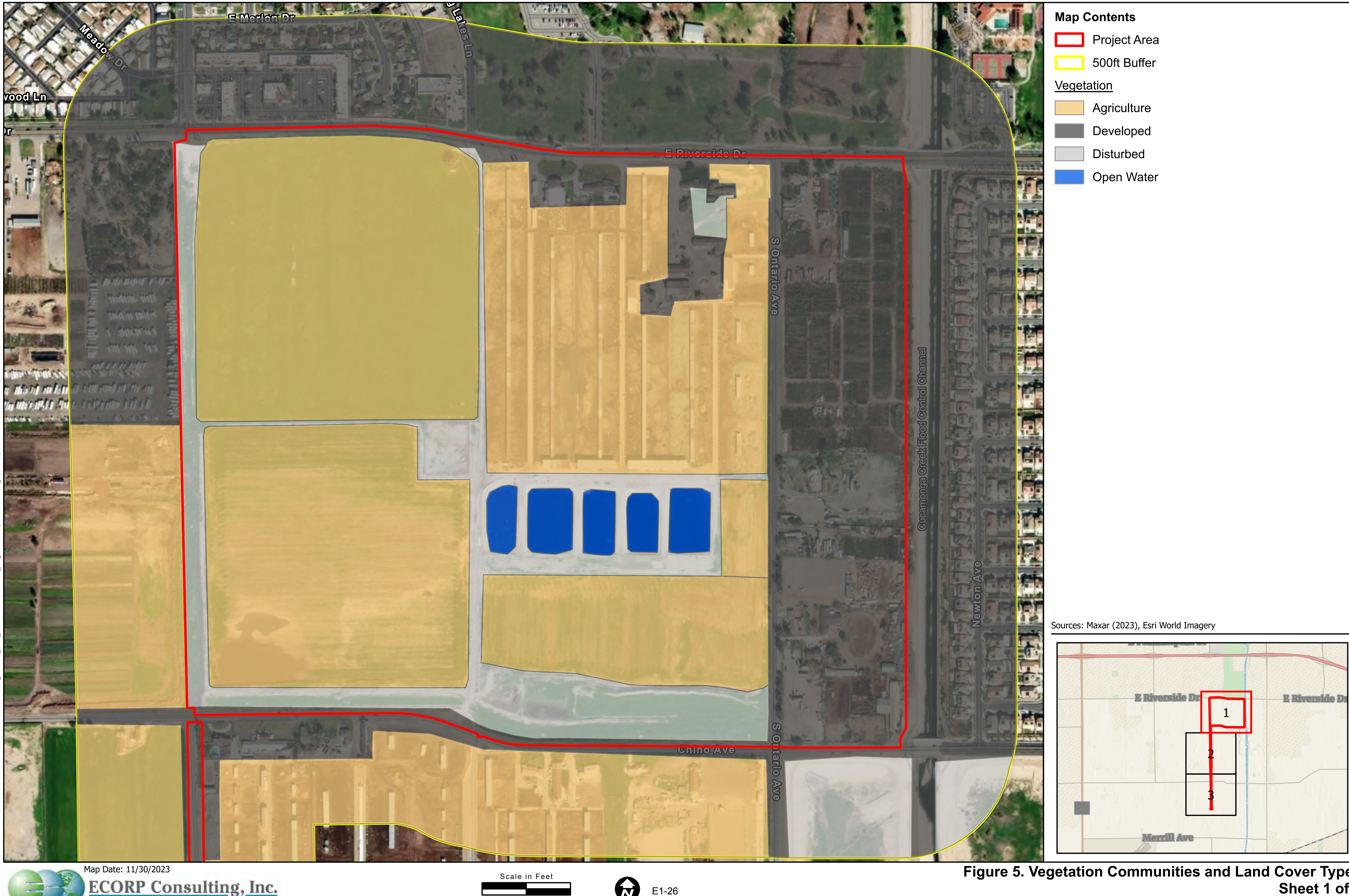
4.2.2.1 Agriculture

Areas classified as Agriculture are used for agriculture or farming and are present throughout the Project Area. These are areas with active or seasonal agriculture or farming practices and therefore may include fallow fields. Within the Project Area, these areas contained corn fields, dairy farm operations, farming areas, and fallow fields. Within this landcover, two locations of individuals of black willow and/or mulefat were observed (Figure 6). As previously mentioned, one to two individuals of mulefat and two to three individuals of black willow were observed within a small, waste management basin north of Edison Avenue and within the offsite improvement area.

Another location of individuals of black willows was documented outside of the Project Area to the northwest. This location is north of Eucalyptus Avenue and approximately 175 feet west of the offsite improvement area. Five individual black willows were observed and appeared to be planted and an irrigation line was visible providing a water source from adjacent agricultural practices.

4.2.2.2 Developed

Developed areas within the Project Area include roadways, housing, commercial buildings, and associated landscaping with these areas.



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Vegetation_and_LandCover\Ontario_Vegetation.aprx - OPB Vegetation (mwilliams - 12/1/2023)

Map Date: 11/30/2023

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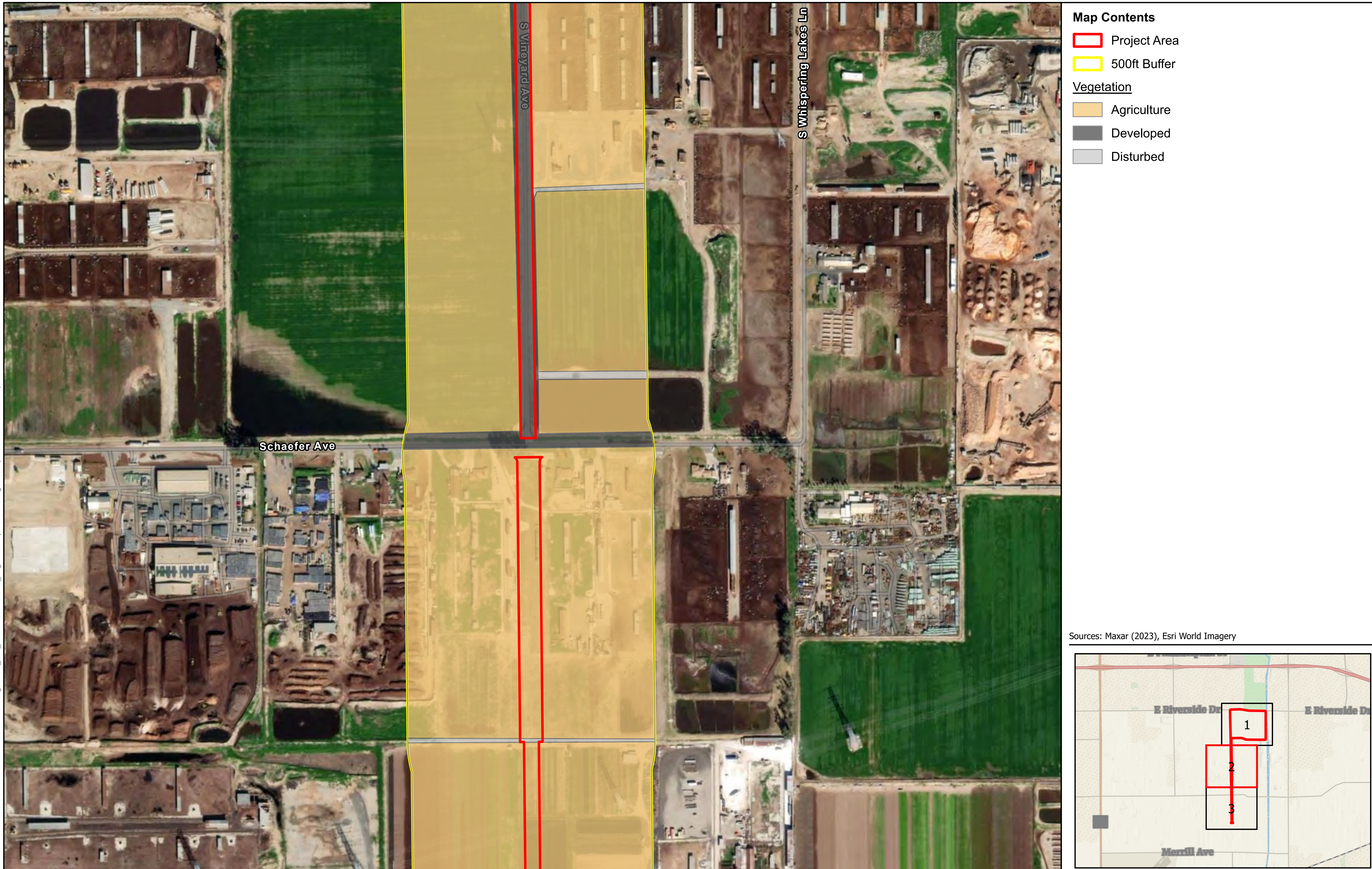
Figure 5. Vegetation Communities and Land Cover Types
Sheet 1 of 3
2023-177 Ontario Ball Park



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Vegetation_and_LandCover\Ontario_Vegetation.aprx - OPB Vegetation (mwilliams - 12/1/2023)

Map Date: 11/30/2023

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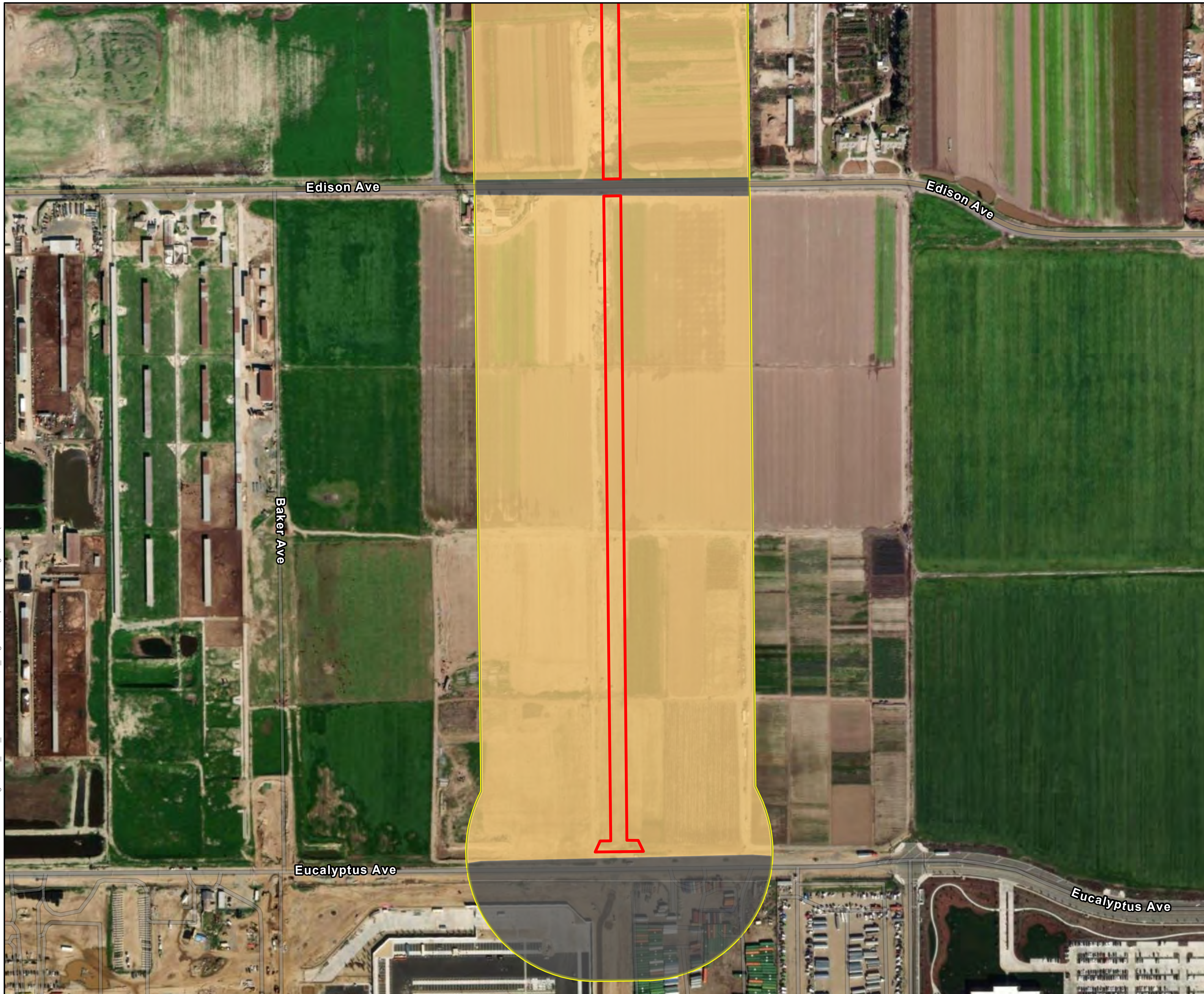
E1-27

Figure 5. Vegetation Communities and Land Cover Types
Sheet 2 of 3
2023-177 Ontario Ball Park



Map Contents

Project Area

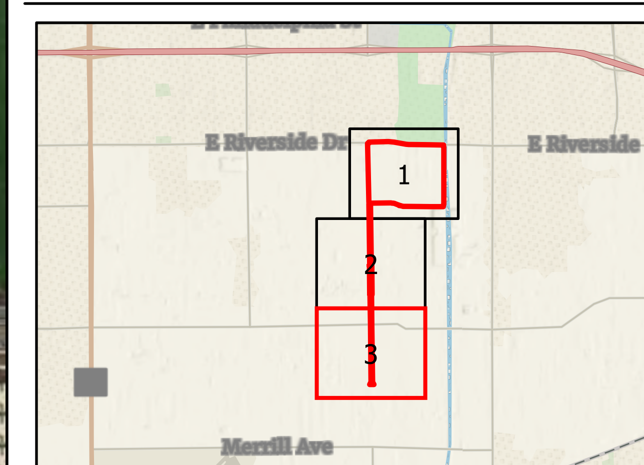
500ft Buffer

Vegetation

Agriculture

Developed

Sources: Maxar (2023), Esri World Imagery



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Vegetation_and_LandCover\Ontario_Vegetation.aprx - OPB Vegetation (mwilliams - 12/1/2023)

Map Date: 11/30/2023

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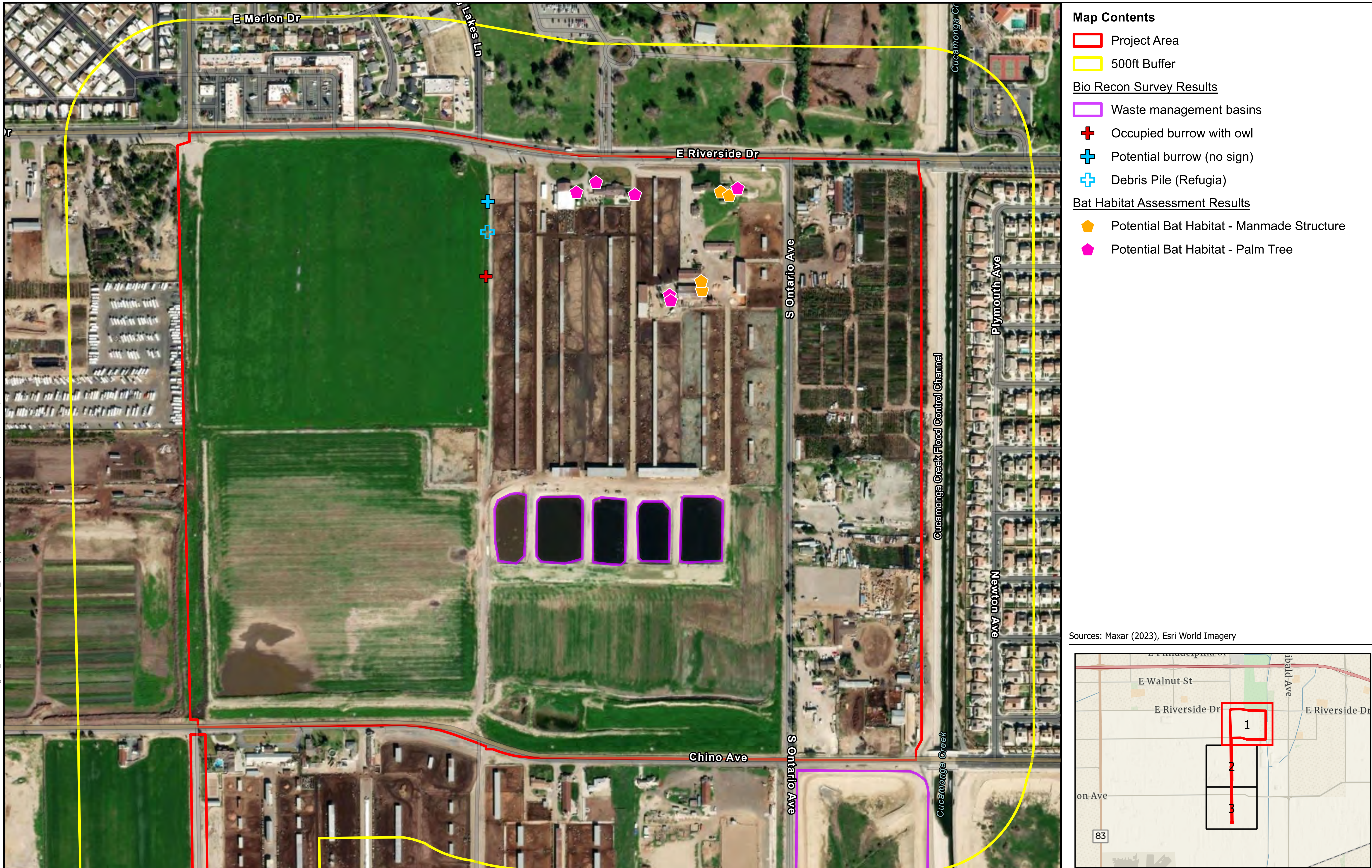
Scale in Feet
0 400

E1-28

Figure 5. Vegetation Communities and Land Cover Types
Sheet 3 of 3
2023-177 Ontario Ball Park



Map Date: 1/11/2024

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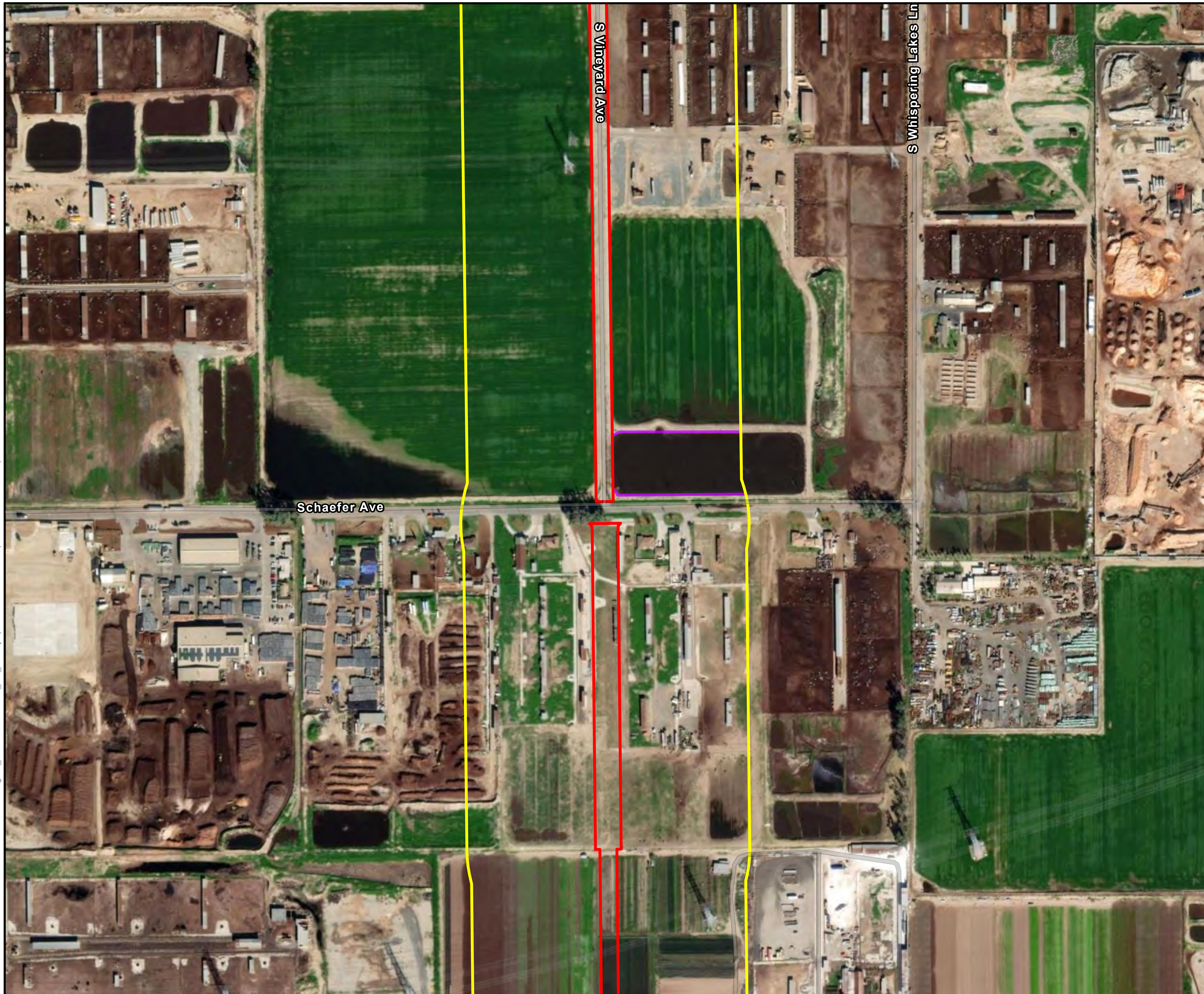
Scale in Feet
0 400

E1-29

Figure 6. Biological Survey Results
Sheet 1 of 3
2023-177 Ontario Ball Park

Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Biological_Resources\Ontario_Bio_Survey.aprx - OBP Bio Results (mwilliams - 1/12/2024)



Map Contents

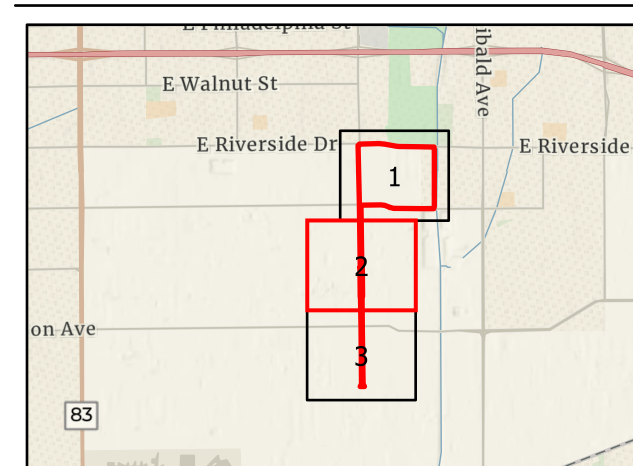
Project Area

500ft Buffer

Bio Recon Survey Results

Waste management basins

Sources: Maxar (2023), Esri World Imagery



Map Date: 1/11/2024

ECORP Consulting, Inc.
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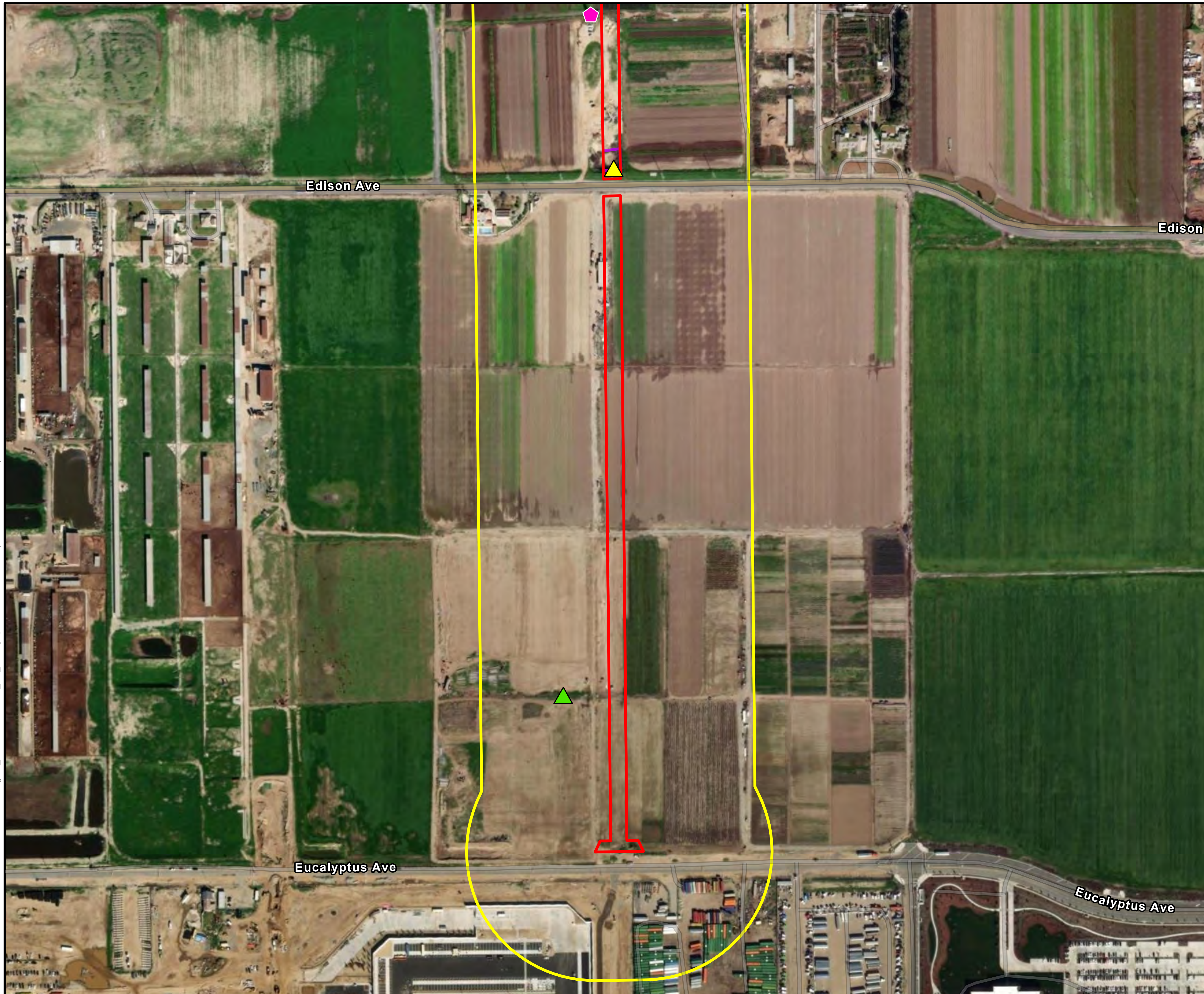
Scale in Feet
0 400

E1-30

Figure 6. Biological Survey Results
Sheet 2 of 3
2023-177 Ontario Ball Park

Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Biological_Resources\Ontario_Bio_Survey.aprx - OBP Bio Results (mwilliams - 1/12/2024)



Map Contents

- Project Area
- 500ft Buffer

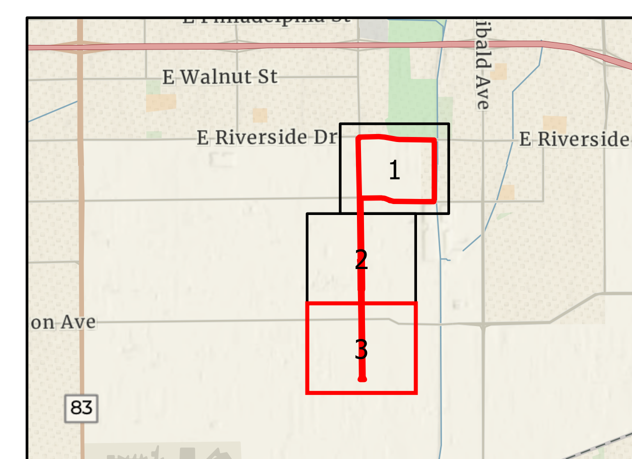
Bio Recon Survey Results

- Waste management basins
- Gooddings Black Willow (*Salix gooddingii*) and Mulefat (*Baccharis salicifolia*)
- Gooddings Black Willow (*Salix gooddingii*)

Bat Habitat Assessment Results

- Potential Bat Habitat - Palm Tree

Sources: Maxar (2023), Esri World Imagery



Map Date: 1/11/2024

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Scale in Feet
0 400

E1-31

Figure 6. Biological Survey Results
Sheet 3 of 3
2023-177 Ontario Ball Park

Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Biological_Resources\Ontario_Bio_Survey.aprx - OBP Bio Results (mwilliams - 1/12/2024)

4.2.2.3 Disturbed

Areas classified as Disturbed were frequently adjacent to Developed or Agriculture areas. No active agriculture operations were located in the areas classified as Disturbed. Characteristics of these areas include the presence of nonnative vegetation and compact or disturbed soils. Previous signs of discing or ground disturbance were evident as well as trash and unauthorized dump sites. Within the Project Area, Disturbed areas were adjacent to active agriculture.

4.2.2.4 Open Water

Open Water within the Project Area consisted of manufactured waste management basins. Some of these basins were filled with water from adjacent agricultural or farming practices. Others showed signs of water being present in the past (i.e., cracked soils). This type of land cover was documented adjacent to the active dairy operation in five waste management basins located in the northern portion of the Project site.

4.2.3 Plants

Plant species observed in the Project Area were generally characteristic of areas disturbed by anthropogenic factors. Dominant plant species observed within the Project Area included nonnative species such as cowpen daisy (*Verbesina encelioides*), Russian thistle (*Salsola tragus*), and wild oat (*Avena fatua*). A stand of eucalyptus trees was present along the south side of Schaefer Avenue and scattered trees were present throughout the Project Area and included queen palm (*Syagrus romanzoffiana*), Mexican fan palm (*Washingtonia robusta*), olive, and willow species (*Salix* sp.).

Within many of the Developed areas, ornamental shrubs and trees were present. However, no trees were identified within the Project Area as suitable for protection as native trees or heritage trees as defined under the City of Ontario Development Code's Tree Preservation Policy and Protection Measures. Due to the disturbed nature of the entire Project Area, the Project Area provides low-quality habitat for most native plant species, including common ones. These observations are consistent with previous reports prepared for the Armstrong Ranch Specific Plan, which described the property as containing non-native grasses, weedy species, and ornamental tree species (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016). A full list of plant species observed on and immediately adjacent to the Project Area is included in Appendix B.

4.2.4 Wildlife

Despite the disturbed nature of the Project Area, numerous wildlife species were documented during the survey. Wildlife observed during the biological reconnaissance survey included species such as common side-blotched lizard (*Uta stansburiana*), burrowing owl, and California ground squirrel (*Otospermophilus beecheyi*). Due to the open agricultural fields and presence of open water, numerous waterfowl were documented at the five waste management basins in the Project site including white-faced ibis (*Plegadis chihi*), least sandpiper (*Calidris minutilla*), and lesser yellowlegs (*Tringa flavipes*). A full list of wildlife species observed on and immediately adjacent to the Project Area is included in Appendix C.

Areas of potential bat-roosting habitat were identified in the Project Area in occupied and abandoned building structures on the dairy farm property as well as in mature trees, including palm trees with intact frond skirts. Scattered bat guano was observed within one of the abandoned structures; however, the entirety of the interior of each of the structures could not be inspected due to safety concerns. Additional structures east of the dairy farm property, within the Project site, were within occupied private property and therefore were not inspected for bat habitat suitability. Additionally, bridges over the Cucamonga Creek Flood Control Channel, east of the Project Area, may provide suitable bat roosting habitat. Access to these structures was not granted at the time of the biological reconnaissance survey.

4.2.5 Potential for Special-Status Plant and Wildlife Species to Occur in the Project Area

The literature review and database searches identified 63 special-status plant species and 49 special-status wildlife species that have previously been documented on or near the Project Area. Many of the species are presumed absent from the Project Area due to the level of human disturbance in the Project Area and current lack of suitable habitat, including soils. However, two special-status plant species and 13 special-status wildlife species identified in the literature review were determined to have potential to occur in the Project Area. One special-status wildlife species, burrowing owl, was observed on the Project site during the biological survey. Details regarding these findings are described in more detail below.

4.2.5.1 Special-Status Plants

There were 63 special-status plant species that appeared in the literature review and database searches for the Project Area (CDFW 2023a; CNPS 2023). A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status plant species on the list. With various habitat types occurring within the nine-quadrangle search, including the San Gabriel Mountains, several species appeared in the literature review results that have no potential to occur on or near the Project Area due to elevational requirements.

After review, two special-status plant species identified in the literature review have a potential to occur, while the remaining 61 are presumed absent due to the heavily disturbed nature of the Project Area and the lack of suitable habitat (including elevation and soils), or because the Project Area is located outside of the known range for the species. These results vary from the results of the previous biological reports of the Armstrong Ranch Specific Plan. Previous biological reports of the Armstrong Ranch Specific Plan concluded that all of the special-status plant species identified in their literature review were presumed absent (Glenn Lukos Associates, Inc. 2015a). Variance in the results is likely due to different species appearing in the literature review, updated CNDDB occurrences within the vicinity of the Project Area, and the addition of the offsite improvement areas along Vineyard Avenue to the current Project, which were not previously surveyed during past biological reports.

Descriptions of the CRPR designations are found in Table 2. Plant species with a CRPR ranking of 3 and 4 were eliminated from the analysis because these rankings are considered a review list and a watch list, respectively. With these rankings, these species are not likely to be federally or state listed in the near future. Due to the disturbed nature of the Project Area, these species are not likely to occur. However, even if they did occur in the Project Area, any impacts to CRPR 3 and 4 species would not be considered significant under CEQA. A table outlining each species, their designations, and potential for occurrence on the Project Area can be found in Appendix D.

Table 3. CRPR Status Designations

List Designation	Meaning
1A	Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere
2A	Plants Presumed Extirpated in California, But Common Elsewhere
2B	Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3	Plants about which more information is needed; a review list
4	Plants of limited distribution; a watch list
CBR	Considered but rejected
List .1, .2 and .3 extension meanings:	
.1	Seriously threatened in California (over 80 percent of occurrences threatened / high degree and immediacy of threat)
.2	Moderately threatened in California (20 to 80 percent occurrences threatened / moderate degree and immediacy of threat)
.3	Not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known)

Note: According to the CNPS (Skinner and Pavlik 1994), plants on Lists 1B and 2 meet definitions for listing as threatened or endangered under Section 1901, Chapter 10, of the California Fish and Game Code (CDFG 1984). This interpretation is inconsistent with other definitions.
CRPR = California Rare Plant Rating

4.2.5.2 Plant Species with a Moderate Potential to Occur

One species was found to have a moderate potential to occur in the Project Area. A brief natural history of this species is below.

Lucky Morning-Glory

Lucky morning-glory (*Calystegia felix*) has a CRPR of 1B.1. This annual rhizomatous herb blooms from March to September and occurs at elevations from 100 to 705 feet. Lucky morning-glory is typically found in meadows and seeps that are sometimes alkaline and in riparian scrub that is alluvial. Microhabitats are historically associated with wetlands and marshes; however, this species can be found in drier habitats (CNPS 2023). This species is also known to occur in disturbed areas with water sources. Threats to this species include development, urbanization, hydrological alterations, weeding, and herbicide application.

The Project Area contains marginally suitable habitat for this species due to the presence of irrigated landscapes. Three recent and one historic occurrence (OCC) were documented in CNDDB within approximately 5 miles of the Project Area (CDFW 2023a). The nearest occurrence was documented in 2015 (OCC 2) approximately 2 miles west of the Project Area. The most recent occurrence was in 2017 (OCC 4) approximately 5 miles west of the Project Area. These occurrences were documented growing within planter beds that were maintained and irrigated for landscaping purposes. Due to the presence of marginally suitable habitat and recent occurrences within 5 miles of the Project Area, this species has a moderate potential to occur.

This species was assessed during past biological reconnaissance-level surveys of the Project site and presumed absent due to a lack of suitable habitat (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016); however, not much information is available in the previously prepared reports to support this determination. For the current Project, this species was found to have a moderate potential to occur due to marginally suitable habitat in the form of irrigated landscapes and recently documented occurrences in the vicinity of the Project Area.

4.2.5.3 Plant Species with a Low Potential to Occur

One species was determined to have a low potential to occur within the Project Area due to limited habitat for the species within the Project Area and a recently documented observation occurs within the database search, but not within 5 miles of the area; a historic documented observation (more than 20 years old) was recorded within 5 miles of the Project Area; or suitable habitat strongly associated with the species occurs onsite, but no records or only historic records were found within the database search.

- smooth tarplant (*Centromadia pungens* ssp. *laevis*), CRPR 1B.1.

This species was assessed during past biological reconnaissance-level surveys of the Project site and presumed absent due to a lack of suitable habitat (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016); however, not much information is available in the previously prepared reports to support this determination. For the current Project, this species was found to have a low potential to occur due to marginally suitable habitat in the form of disturbed lands, including roadsides and historic and recent occurrences documented in the vicinity of the Project Area.

4.2.5.4 Plant Species Presumed Absent

The following species were presumed absent from the Project Area due to the heavily disturbed nature of the Project Area and the lack of suitable habitat (including elevation and soils), or because the Project Area is located outside of the known range for the species:

- chaparral sand-verbena (*Abronia villosa* var. *aurita*), CRPR 1B.1;
- Yucaipa onion (*Allium marvinii*), CRPR 1B.2;
- Munz's onion (*Allium munzii*), federally listed (Endangered), state listed (Threatened), CRPR 1B.1;
- singlewhorl burrobrush (*Ambrosia monogyra*), CRPR 2B.2;

- San Diego ambrosia (*Ambrosia pumila*), federally listed (Endangered), CRPR 1B.1;
- Rock Creek broomrape (*Aphyllon validum* ssp. *validum*), CRPR 1B.2;
- San Gabriel manzanita (*Arctostaphylos glandulosa* ssp. *gabrielensis*), CRPR 1B.2;
- marsh sandwort (*Arenaria paludicola*), CRPR 1B.1, state- and federally listed (Endangered);
- Coulter's saltbush (*Atriplex coulteri*), CRPR 1B.2;
- Braunton's milk-vetch (*Astragalus brauntonii*), federally listed (Endangered), CRPR 1B.1;
- Malibu baccharis (*Baccharis malibuensis*), CRPR 1B.1;
- Nevin's barberry (*Berberis nevinii*), CRPR 1B.1, state- and federally listed (Endangered);
- slender mariposa-lily (*Calochortus clavatus* var. *gracilis*), CRPR 1B.2;
- intermediate mariposa-lily (*Calochortus weedii* var. *intermedius*), CRPR 1B.2;
- Santa Barbara morning-glory (*Calystegia sepium* ssp. *binghamiae*), CRPR 1A;
- salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), CRPR 1B.2, state- and federally listed (Endangered);
- San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), CRPR 1B.1;
- Parry's spineflower (*Chorizanthe parryi* var. *parryi*), CRPR 1B.1;
- long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), CRPR 1B.2;
- white-bracted spineflower (*Chorizanthe xanti* var. *leucotheca*), CRPR 1B.2;
- California saw-grass (*Cladium californicum*), CRPR 2B.2;
- Peirson's spring beauty (*Claytonia peirsonii* ssp. *peirsonii*), CRPR 1B.2;
- Tulare cryptantha (*Cryptantha incana*), CRPR 1B.3;
- slender-horned spineflower (*Dodecahema leptoceras*), state- and federally listed (Endangered), CRPR 1B.1;
- many-stemmed dudleya (*Dudleya multicaulis*), CRPR 1B.2;
- Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*), state- and federally listed (Endangered), CRPR 1B.1;
- Johnston's buckwheat (*Eriogonum microthecum* var. *johnstonii*), CRPR 1B.3;
- Tecate cypress (*Hesperocyparis forbesii*), CRPR 1B.1;
- Gowen cypress (*Hesperocyparis goveniana*), CRPR 1B.2;
- mesa horkelia (*Horkelia cuneata* var. *puberula*), CRPR 1B.1;

- Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*), CRPR 1B.1;
- heart-leaved pitcher sage (*Lepechinia cardiophylla*), CRPR 1B.2;
- lemon lily (*Lilium parryi*), CRPR 1B.2;
- San Gabriel linanthus (*Linanthus concinnus*), CRPR 1B.2;
- Parish's desert-thorn (*Lycium parishii*), CRPR 2B.3;
- Parish's bush-mallow (*Malacothamnus parishii*), CRPR 1A;
- Jokerst's monardella (*Monardella australis* ssp. *jokerstii*), CRPR 1B.1;
- Brown's flat monardella (*Monardella breweri* ssp. *glandulifera*), CRPR 1B.2;
- intermediate monardella (*Monardella hypoleuca* ssp. *intermedia*), CRPR 1B.3;
- Hall's monardella (*Monardella macrantha* ssp. *hallii*), CRPR 1B.3;
- Pringle's monardella (*Monardella pringlei*), CRPR 1A;
- Aparejo grass (*Muhlenbergia utilis*), CRPR 2B.2;
- mud nama (*Nama stenocarpa*), CRPR 2B.2;
- prostrate vernal pool navarretia (*Navarretia prostrata*), CRPR 1B.2;
- chaparral nolina (*Nolina cismontana*), CRPR 1B.2;
- short-joint beavertail (*Opuntia basilaris* var. *brachyclada*), CRPR 1B.2;
- woolly mountain-parsley (*Oreonana vestita*), CRPR 1B.3;
- California beardtongue (*Penstemon californicus*), CRPR 1B.2;
- Allen's pentachaeta (*Pentachaeta aurea* ssp. *allenii*), CRPR 1B.1;
- Santiago Peak phacelia (*Phacelia keckii*), CRPR 1B.3;
- Brand's star phacelia (*Phacelia stellaris*), CRPR 1B.1;
- white rabbit-tobacco (*Pseudognaphalium leucocephalum*), CRPR 2B.2;
- Sanford's arrowhead (*Sagittaria sanfordii*), CRPR 1B.2;
- chaparral ragwort (*Senecio aphanactis*), CRPR 2B.2;
- salt spring checkerbloom (*Sidalcea neomexicana*), CRPR 2B.2;
- prairie wedge grass (*Sphenopholis obtusata*), CRPR 2B.2;
- San Bernardino aster (*Symphyotrichum defoliatum*), CRPR 1B.2;
- Greata's aster (*Symphyotrichum greatae*), CRPR 1B.3;

- rigid fringepod (*Thysanocarpus rigidus*), CRPR 1B.2;
- grey-leaved violet (*Viola pinetorum* ssp. *grisea*), CRPR 1B.2; and
- western Joshua tree (*Yucca brevifolia*), CRPR CBR; state listed (Candidate).

4.2.5.5 Special-Status Wildlife

The literature search identified 49 special-status wildlife species that had previously been documented on or in the vicinity of the Project Area. A list was generated from the results of the literature review and the Project was evaluated for suitable habitat that could support any of the special-status wildlife species on the list. The Project Area's disturbed nature, proximity to commercial development, and anthropogenic influences likely preclude many of these species from occurring. A brief natural history and discussion of the special-status wildlife species that were found present during the biological reconnaissance survey or that are determined to have a moderate potential to occur within the Project Area is provided below. A table outlining each species, their designations, and potential for occurrence on the Project Area can be found in Appendix E.

4.2.5.6 Wildlife Species Present within the Project Area

The following special-status species was observed during the biological reconnaissance survey (Figure 6).

Burrowing Owl

Burrowing owl is a CDFW SSC. Burrowing owls historically occurred throughout much of California and the western U.S.; however, many former California populations have been extirpated. Burrowing owls typically inhabit open habitats, primarily grasslands and deserts. Burrowing owls require burrows for roosting and nesting cover. Although they often nest in abandoned California ground squirrel burrows, they will also use other small mammal burrows, pipes, culverts, and nest boxes, particularly where burrows are scarce (Zeiner et al. 1990).

The Project Area provides suitable burrowing owl habitat and, at the time of the biological reconnaissance survey, one live burrowing owl was documented at burrow immediately adjacent to the active dairy farm and within a dirt berm along an access road. The burrow was briefly inspected and whitewash, feathers, and a pellet were present. Due to the time of year of the biological reconnaissance survey, this owl may be a year-round resident, winter resident, migrant, or transient or new colonizer (CDFG 2012). No evidence of breeding was observed at the time of the sighting; however, this was not expected due to the time of year (i.e., fall and the non-breeding season [generally September 1 through January 31]).

The low-growing vegetation present throughout the Project Area and the presence of friable soils, California ground squirrel burrows, and debris piles offer suitable burrow and refugia habitat for burrowing owls. Although only one live burrowing owl was observed during the biological survey, due to the mobile nature of the burrowing owl, it is possible for burrowing owls to move onto or off of the site throughout the year.

The CNDDB documented 51 occurrences of this species in the vicinity of the Project Area (CDFW 2023a), one of which was recorded within the Project Area in 2011 (OCC 1199; CDFW 2023a). Thirty-one of these occurrences were recently documented (in the last 20 years) within 5 miles of the Project Area. The most recent occurrences were recorded in 2016 approximately 3 miles southwest and 4 miles northeast of the Project Area (OCC 1993 and 561, respectively; CDFW 2023a).

Previous biological studies performed in support of the Armstrong Ranch Specific Plan documented burrowing owl habitat in the Project site. However, after focused (protocol-level) surveys were conducted in 2014 and 2015, this species was determined to be absent due to a lack of observations of live burrowing owls or burrowing owl sign (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

4.2.5.7 Wildlife Species with a Moderate Potential to Occur

Two species were found to have a moderate potential to occur in the Project Area. Although these species were not observed in the Project Area during the biological reconnaissance survey, habitat for the species occurs onsite, and a known occurrence has been reported in the database, but not within 5 miles of the site; or a recently documented observation occurs within 5 miles of the site and marginal or limited amounts of habitat occurs onsite.

Crotch Bumble Bee

The Crotch bumble bee (*Bombus crotchii*) was petitioned for listing under the California ESA in October 2018 (Hatfield et al. 2018), advanced to candidacy in June 2019, was challenged in courts and the candidacy was temporarily stayed beginning in February 2021, and candidacy was recently reinstated in September 2022 (CDFW 2023d). This species is associated with open grassland and scrub habitats and occurs primarily in California, including the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills through most of southwestern California (Williams et al. 2014). Crotch bumble bees primarily nest underground, and may occupy cavities in a variety of substrates including: thatched grasses, abandoned rodent burrows or bird nests, brush piles, rock piles, and fallen logs (Alford 1975; Free and Colin Gasking Alford 1959; Fussell and Corbet 1992; Lye et al. 2012; Sladen 1912; Williams et al. 2014) and have also been found nesting in manmade structures such as walls, rubble or abandoned furniture (Fussell and Corbet 1992, Williams et al. 2014). Bumble bee nests are annual and conclude with deaths of the queen, workers, and drones at the end of the season with only the mated gyne (future queen) surviving the winter (overwintering) in order to emerge the following spring to start the next year's colony. Similar to other bumble bee species, Crotch bumble bee is a generalist forager and reportedly visits a variety of flowering plants, including *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia,* and *Salvia*.

The Project Area contains marginally suitable habitat for this species. Activities from the active dairy farm—such as plowing, grazing, fertilizer, and trampling—likely preclude this species from nesting/overwintering in the active agriculture fields and livestock pens. However, this species has the potential to be present along the edges of these areas and in areas less frequently disturbed. The scattered small mammal burrows within and on the edges of agricultural fields and cattle pens could provide marginal nesting and overwintering habitat. The open areas and disturbed/developed areas with flowering resources (including active and fallow agricultural fields, cattle pens, and landscaped areas) could provide potential foraging habitat for this species at certain times of the year. This species was not incidentally observed during the biological survey conducted in 2023.

Numerous recent and historic occurrences were documented in CNDDB; however, only three were within 5 miles of the Project Area (CDFW 2023a). OCC 247 was documented in 2019 approximately 3 miles northeast of the Project Area. OCC 316 was documented in 2020 approximately 3 miles northeast of the Project Area. OCC 187 was documented in 1894 approximately 3 miles northwest of the Project Area. No additional information regarding habitat type or plant species associated with these occurrences was provided. Due to the potential presence of potential foraging, nesting, and overwintering habitat and recent CNDDB records within 5 miles of the Project Area, this species was determined to have moderate potential for occurrence.

This species was not assessed in the biological reports prepared in support of the Armstrong Ranch Specific Plan because the species was not a special-status species and did not have legal protections at the time those reports were prepared (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

Western Yellow Bat

Western yellow bat (*Lasiurus xanthinus*) is a CDFW SSC also within the Vespertilionidae family. This species is often discernable from other bat species due to their distinct yellow fur along with their larger size and short ears (Western Bat Working Group [WBWG] 2023). Western yellow bat occurs throughout the southwestern United States and into northwestern Mexico. As a tree roosting species, western yellow bat most commonly roosts between the fronds of in the intact frond skirts of both native and non-native palm trees. Western yellow bats have also been documented roosting in trees in riparian woodland habitats such as cottonwood trees (*Populus* sp.). They are suspected to be non-colonial, roosting as individuals in trees or hanging from the underside of a leaf (WBWG 2023). Western yellow bats are insectivores and have been documented foraging in areas with water features and in open grassland and riparian habitats (WBWG 2023).

Suitable roosting habitat is present in the Project Area in the form of mature palm trees with intact thatch and other mature tree species (Figure 6). Suitable foraging habitat is present within the Project Area in open agricultural fields and vegetation that harbors insect prey populations. This species is also known to occur in urban and suburban environments when suitable habitat is present (WBWG 2023).

Numerous historic occurrences were documented in CNDDB; however, only one was within 5 miles of the Project Area (CDFW 2023a). OCC 23 was documented in 1981 approximately 4 miles southeast of the Project Area. It is important to note that documented occurrences of bat species are underrepresented in databases such as CNDDB, and the CNDDB records should not be solely used to determine potential for occurrence. The potential for occurrence for bat species, including western yellow bat, should consider the ecology of the species and presence of suitable roosting and foraging habitat. Due to the presence of suitable roosting and foraging habitat within and adjacent to the Project Area, this species has a moderate potential to occur.

According to past biological reports prepared in support of the Armstrong Ranch Specific Plan, this species was determined to have a low potential to occur in the Project site due to the presence of ornamental fan palms (Glenn Lukos Associates, Inc. 2015a). Additionally, this was the only bat species determined to have potential to roost and breed within the Project site in the previously prepared biological reports (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

4.2.5.8 Wildlife Species with a Low Potential to Occur

Ten species were determined to have a low potential to occur within the Project Area due to limited or marginal habitat for the species occurs within the Project Area and a recently documented observation occurs within the database search, but not within 5 miles of the area; a historic documented observation (more than 20 years old) was recorded within 5 miles of the Project Area; or suitable habitat strongly associated with the species occurs onsite, but no records or only historic records were found within the database search.

- Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*), federally listed (Endangered);
- coastal whiptail (*Aspidoscelis tigris stejnegeri*), CDFW SSC;
- tricolored blackbird (*Agelaius tricolor*), state listed (Threatened), CDFW SSC;
- Swainson's hawk (*Buteo swainsoni*), state listed (Threatened);
- white-tailed kite (*Elanus leucurus*), CDFW Fully Protected;
- pallid bat (*Antrozous pallidus*), CDFW SSC;
- western mastiff bat (*Eumops perotis californicus*), CDFW SSC;
- pocketed free-tailed bat (*Nyctinomops femorosaccus*), CDFW SSC;
- big free-tailed bat (*Nyctinomops macrotis*), CDFW SSC; and
- Los Angeles pocket mouse (*Perognathus longimembris brevinasus*), CDFW SSC.

Delhi Sands flower-loving fly, white-tailed kite, western mastiff bat, and big free-tailed bat were assessed in previous biological reports prepared in support of the Armstrong Ranch Specific Plan and determined to have a potential to occur (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016). Tricolored blackbird, Swainson's hawk, pallid bat, pocketed free-tailed bat, and Los Angeles pocket mouse were also assessed in these previous biological reports but were presumed absent due to a lack of suitable habitat within the Project site. Coastal whiptail did not appear in the literature review for these past biological reports and therefore its potential to occur was not assessed. A brief description of the results of the previously prepared reports as they pertain to these species is provided below as well as an explanation of why they have a low potential to occur for the current Project.

- Delhi Sands flower-loving fly: A focused habitat suitability assessment was performed in February 2015 within portions of the Armstrong Ranch Specific Plan area and habitat in those portions was determined to be unsuitable due to site characteristics and disturbances; it was concluded that there was no potential for this species to occur (Glenn Lukos Associates, Inc. 2015a; City of

Ontario 2016). However, because portions of the property were not surveyed, it was recommended at the time that a USFWS-permitted Delhi Sands flower-loving fly biologist perform a focused habitat suitability assessment of these areas (City of Ontario 2016). Due to the presence of soils within the Delhi Sands soil series and numerous recent and historic occurrences in CNDDB, this species has a low potential to occur.

- Coastal whiptail: This species did not appear in the literature review of past biological reports in support of the Armstrong Ranch Specific Plan and therefore its potential to occur was not assessed. However, due to the presence of marginally suitable habitat in the form of disturbed areas with low growing or little ground cover, this species has a low potential to occur. Numerous recent and historic occurrences are documented in CNDDB; however, none were within 5 miles of the Project Area.
- Tricolored blackbird: This species was presumed absent in past biological reports due to a lack of suitable habitat within the Project site (Glenn Lukos Associates, Inc. 2015a). However, limited suitable nesting habitat is present throughout the Project Area in the form of corn fields and suitable foraging habitat is present in the form of waste management basins with open water, cultivated fields, and dairy farm feedlots. Additionally, this species is known to nest in agricultural areas that were formally wetlands and forage in cultivated fields and feedlots associated with dairy farms (The Cornell Lab 2023).
- Swainson's hawk: This species was presumed absent in past biological reports due to a lack of suitable habitat within the Project site (Glenn Lukos Associates, Inc. 2015a). This species has not been documented south of the Transverse Mountain Ranges in several decades; however, limited suitable nesting habitat is present in the Project Area in the form of tall eucalyptus trees and suitable foraging habitat is present in the form of agricultural fields.
- White-tailed kite: This species was determined to have a potential to forage within portions of the Armstrong Ranch Specific Plan area; it was not anticipated that this species would nest within the areas surveyed. However, nesting bird surveys were recommended (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016). Suitable habitat for this species in the form of tall trees and open agricultural fields is present throughout the Project Area. Additionally, five recent occurrences were documented in CNDDB with two being within 5 miles of the Project Area (OCC 139 and 140 in 2009; CDFW 2023a).
- Pallid bat and pocketed free-tailed bat: These bat species were presumed absent in past biological reports due to a lack of suitable roosting and foraging habitat within the Project site (Glenn Lukos Associates, Inc. 2015a). However, marginally suitable roosting habitat was identified during the bat habitat assessment in the Project Area in the form of abandoned buildings.
- Western mastiff bat and big free-tailed bat: Both of these bat species were determined to have a low potential to forage within portions of the Armstrong Ranch Specific Plan area (City of Ontario 2016). According to the 2015 biological report in support of the Armstrong Ranch Specific Plan, the potential for these species was lessened due to a lack of observed flying insects within the survey area. However, special-status bat surveys were recommended (Glenn Lukos Associates, Inc.

2015a). These species have a low potential to occur within the Project Area due to the presence of suitable roosting habitat in the form of abandoned buildings or mature trees and suitable foraging habitat over open water and agricultural fields.

- Los Angeles pocket mouse: This species was presumed absent in past biological reports due to a lack of suitable habitat within the Project site. However, marginally suitable habitat is present throughout the Project Area in the form of disturbed grassy areas with friable soils.

4.2.5.9 Wildlife Species Presumed Absent

A total of 36 species are presumed absent. These species were not observed or documented in the Project Area at the time of the biological reconnaissance survey and the habitat present in the Project Area was not suitable. For some species, there were historic or recent sightings near the site; however, due to the lack of suitable habitat within the Project Area, these species are presumed absent.

- Quino checkerspot butterfly (*Euphydryas editha quino*), federally listed (Endangered);
- San Diego fairy shrimp (*Branchinecta sandiegonensis*), federally listed (Endangered);
- Santa Ana sucker (*Catostomus santaanae*), federally listed (Threatened);
- arroyo chub (*Gila orcutti*), CDFW SSC;
- Santa Ana speckled dace (*Rhinichthys osculus* ssp. 8), CDFW SSC;
- arroyo toad (*Anaxyrus californicus*), federally listed (Endangered), CDFW SSC;
- foothill yellow-legged frog south coast Distinct Population Segment (*Rana boylii* pop. 6), state- and federally listed (Endangered);
- southern mountain yellow-legged frog (*Rana muscosa*), state- and federally listed (Endangered);
- western spadefoot (*Spea hammondii*), CDFW SSC;
- Coast Range newt (*Taricha torosa*), CDFW SSC;
- southern California legless lizard (*Anniella stebbinsi*) CDFW SSC;
- California glossy snake (*Arizona elegans occidentals*) CDFW SSC;
- San Diego banded gecko (*Coleonyx variegatus abbotti*), CDFW SSC;
- red-diamond rattlesnake (*Crotalus ruber*), CDFW SSC;
- western pond turtle (*Emys marmorata*), CDFW SSC;
- coast horned lizard (*Phrynosoma blainvillii*) CDFW SSC;
- coast patch-nosed snake (*Salvadora hexalepis virgultea*), CDFW SSC;
- two-striped gartersnake (*Thamnophis hammondii*), CDFW SSC;

- grasshopper sparrow (*Ammodramus savannarum*), CDFW SSC;
- golden eagle (*Aquila chrysaetos*), CDFW Fully Protected;
- long-eared owl (*Asio otus*), CDFW SSC;
- coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), CDFW SSC;
- western yellow-billed cuckoo* (*Coccyzus americanus occidentalis*), state listed (Endangered), federally listed (Threatened);
- yellow rail (*Coturnicops noveboracensis*), CDFW SSC;
- black swift (*Cypseloides niger*), CDFW SSC;
- southwestern willow flycatcher* (*Empidonax traillii extimus*), state- and federally listed (endangered);
- bald eagle (*Haliaeetus leucocephalus*), state listed (Endangered), federally delisted, CDFW Fully Protected;
- yellow-breasted chat* (*Icteria virens*), CDFW SSC;
- California black rail (*Laterallus jamaicensis coturniculus*), state listed (Threatened), CDFW Fully Protected;
- coastal California gnatcatcher (*Polioptila californica californica*), federally listed (Threatened), CDFW SSC;
- yellow warbler* (*Setophaga petechia*), CDFW SSC;
- least Bell's vireo* (*Vireo bellii pusillus*), state- and federally listed (Endangered);
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*), state listed (Candidate), federally listed (Endangered), CDFW SSC;
- Stephens' kangaroo rat (*Dipodomys stephensi*), state listed and federally listed (Threatened);
- San Diego desert woodrat (*Neotoma lepida intermedia*), CDFW SSC; and
- desert bighorn sheep (*Ovis canadensis nelsoni*), CDFW Fully Protected.

*Although mulefat and black willow were documented in the southern portion of the Project Area, these areas were not large or well-established enough to provide suitable habitat for special-status riparian-obligate bird species. These sparsely distributed mulefat and black willows, consisting of approximately one to five individuals each, do not provide the appropriate structure, cover, size, or density for the special-status bird species identified in the literature review to inhabit, nest in, or use as a migratory stopover point.

4.2.6 Raptors and Migratory Birds

Potential nesting habitat for migratory birds and raptors protected by the MBTA and California Fish and Game Code was present throughout the Project Area in the form of tall trees, such as the stand of eucalyptus and landscaped trees, and structures (buildings, barns, etc.). Suitable nesting habitat for ground-nesting bird species, such as mourning doves, was also present in the Project Area. Evidence of previous nesting within the Project Area was noted during the biological reconnaissance survey (old stick nests in barn buildings and old mud nests on residential buildings). Due to the presence of suitable nesting habitat, nesting native and migratory birds and raptors could use the Project Area during the nesting bird season (typically February 1 through August 31). These conclusions are consistent with previous biological reports prepared for the Armstrong Ranch Specific Plan (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

4.2.7 Aquatic Resources

During the biological survey, several manmade waste management basins were identified within the Project Area. The locations of these basins are shown on Figure 6. Five were documented in the northern portion of the Project site, in an area that is currently in use as an active dairy farm. Water was present in these five basins at the time of the biological survey. An additional waste management basin was documented within the southern portion of the Project Area, north of Edison Avenue and within the offsite improvement area. All of these constructed waste management basins were evaluated as being non-jurisdictional to USACE, RWQCB, and CDFW, as they consist of manmade features constructed for dairy farming operations under an Engineered Waste Management Plan for the RWQCB. The five basins within the northern portion of the Project site are actively managed and maintained free of vegetation. Aerial imagery shows that the basin in the southern portion of the Project Area, north of Edison Avenue and within the offsite improvement area, was maintained until 2020 or 2021, when the dairy farm was converted to a nursery. All basins were constructed in uplands and would revert to dry land should application of water to the areas cease. The basins are isolated features that do not have a continuous surface connection to a navigable water. Three sample points were collected for the one waste management basin within the offsite improvement area that is not currently maintained, and the basin did not pass the three-criteria test necessary to be considered a wetland (ECORP 2023). An aquatic resources delineation report was prepared for the field sampling effort at the unmaintained waste management basin under a separate cover (ECORP 2023).

Immediately east of the Project Area is the Cucamonga Creek Flood Control Channel. The 2015 biological report prepared for the Armstrong Ranch Specific Plan identified the Cucamonga Creek Flood Control Channel as a potential jurisdictional aquatic resource (Glenn Lukos Associates, Inc. 2015a). The channel is a constructed feature but conveys flows from Cucamonga Creek, which is considered a relatively permanent, or intermittent, waterway. This same feature was identified in the Armstrong Ranch Specific Plan EIR as a federally and state jurisdictional waterway (City of Ontario 2016). No additional aquatic resources were identified in the 2015 biological report or the Armstrong Ranch Specific Plan EIR (City of Ontario 2016; Glenn Lukos Associates, Inc. 2015a).

4.2.8 Wildlife Movement Corridors, Linkages, and Native Wildlife Nursery Sites

The concept of habitat corridors addresses the linkage between large blocks of habitat that allow the safe movement of mammals and other wildlife species from one habitat area to another. The definition of a corridor varies, but corridors may include such areas as greenbelts, refuge systems, channels and flood control, underpasses, and biogeographic land bridges. In general, a corridor is described as a linear habitat embedded in a dissimilar matrix that connects two or more large blocks of habitat. Wildlife movement corridors are critical for the survivorship of ecological systems for several reasons. Corridors can connect water, food, and cover sources, spatially linking these three resources with wildlife in different areas. In addition, wildlife movement between habitat areas provides for the potential of genetic exchange between wildlife species populations, thereby maintaining genetic variability and adaptability to maximize the success of wildlife responses to changing environmental conditions. This is especially critical for small populations subject to loss of variability from genetic drift and effects of inbreeding. The nature of corridor usage and wildlife movement patterns vary greatly among species.

The Project Area was assessed for its ability to function as a wildlife corridor. Although the Project Area contains open areas, it is completely surrounded by urban development and is isolated from large, contiguous blocks of native habitat. The nearest natural wildlife corridor and area is the Santa Ana River approximately 6.5 miles south of the center of the Project site and approximately 4.75 miles south of the southern extent of the offsite improvement area. Less than 1 mile north of the Project Area is SR-60 and approximately 3 miles to the east is I-15; both are major highways that limit wildlife movement. Additionally, the lack of consistent vegetative cover within the Project Area, the urban nature of the site, and the high density of nonnative weedy vegetation across the Project Area likely deter wildlife from using the area for movement opportunities due to lack of suitable cover. Wildlife commonly found in urban areas (e.g., coyote [*Canis latrans*]) could use portions of the Project Area or areas immediately adjacent to the Project Area, such as the Cucamonga Creek Flood Control Channel approximately 60 feet to the east, for local travel but the Project Area itself does not provide wildlife movement corridor or linkage opportunities. Additionally, portions of the Cucamonga Creek Flood Control Channel that are nearest to the Project Area are completely surrounded with chain-link fencing, reducing the ability of wildlife traveling through the Project Area from entering this wildlife corridor. This conclusion is consistent with previous biological reports prepared in support of the Armstrong Ranch Specific Plan (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

The Project Area was also assessed for its ability to function as a native wildlife nursery site. Suitable nesting habitat for bird species was documented within the Project Area. However, due to the level of disturbance within and adjacent to the Project Area, nursery site habitat for bird species (e.g., heron rookery) is not anticipated to occur. Suitable bat roosting habitat was observed within the Project Area and there is potential for the structures and trees observed to serve as bat maternity roost sites during the bat maternity season (April 1 through August 31). Maternity roosts are considered protected as native wildlife nursery sites under CEQA. Past biological reports prepared for the Armstrong Ranch Specific Plan did not identify existing or potential nursery sites within the Project site (Glenn Lukos Associates, Inc. 2015a; City of Ontario 2016).

5.0 IMPACT ANALYSIS

5.1 Special-Status Species

The Project Area consists of an active dairy farm operation and agricultural lands. Disturbances were present throughout the Project Area due to active or past agriculture practices; these disturbances included trash, compacted soils, fallow fields, active agriculture, trash, and vehicle tracks.

The literature review and database searches identified 63 special-status plant species and 49 special-status wildlife species that have previously been documented on or near the Project Area. Two special-status plant species were determined to have a moderate or low potential to occur while the remaining 61 special-status plant species were determined to be absent due to the heavily disturbed nature of the Project Area and the lack of suitable habitat (including elevation and soils) or because the Project is located outside of the known range for the species. Lucky morning-glory (CRPR 1B.1) has a moderate potential to occur within the Project Area due to the presence of marginal suitable habitat throughout the Project Area in the form of irrigated landscapes (e.g., agricultural fields). Smooth tarplant (CRPR 1B.1) has a low potential to occur due to the presence of marginally suitable habitat throughout the Project Area in the form of disturbed areas including roadsides. Anthropogenic disturbances, such as activities associated with active agriculture, likely reduce the suitability of habitat within the Project Area. Should these species occur within the Project Area, direct impacts in the form of ground disturbance, vegetation removal, and mortality and indirect impacts from dust and habitat loss may occur to this species. Impacts to special-status plant species would be less than significant with the implementation of Mitigation Measures BIO-1 and 2. The Mitigation Measures for the Proposed Project are discussed in Section 6.0.

Of the 49 special-status wildlife species identified in the literature review, one was present, two have a moderate potential to occur, and 10 have a low potential to occur. The remaining 36 species are presumed absent due to a lack of suitable habitat, the Project Area being outside the known range for the species, or because there are no recent or historic occurrences within five miles of the Project Area.

Burrowing owl was observed within the Project Area during the biological survey. This species is a CDFW SSC and is protected by the MBTA and California Fish and Game Code. During the survey, one live burrowing owl was documented in the northern portion of the Project Area, adjacent to an active dairy farm. Additionally, California ground squirrel burrows and debris piles suitable for use as burrowing owl burrows and/or refugia were observed in the Project Area. Suitable foraging habitat is also present throughout the Project Area in the form of agricultural fields and disturbed grassy areas. The literature review and database search identified numerous recent and historic occurrences within five miles of the Project Area in CNDDB (CDFW 2023a). Although only one live owl was observed, due to the mobile nature of this species and the presence of suitable burrowing and foraging habitat, burrowing owls may be present within the Project Area prior to the start of Project activities. Direct impacts in the form of ground disturbance, vegetation removal, habitat loss, and mortality and indirect impacts from construction noise and vibrations may occur to this species. Impacts to burrowing owl would be less than significant with the implementation of Mitigation Measures BIO-1 and 3.

Crotch bumble bee has a moderate potential to occur within the Project Area and is a Candidate for state listing and is therefore afforded all the protections as though it were listed under the California ESA. It was determined that this species has a moderate potential to occur due to the presence of pockets of suitable friable soils, suitable burrow habitat, suitable burrows (i.e., California ground squirrel burrows), and nectar sources within and adjacent to the Project Area. Numerous recent and historic occurrences were documented in the CNDDB; however, only three were within five miles of the Project Area (CDFW 2023a). If Crotch bumble bee is found to be using or nesting in the Project Area prior to the start of construction, impacts to Crotch bumble bee may occur in the form of direct mortality of individuals, direct mortality to an active nesting colony, direct mortality to an overwintering individual, conversion of foraging habitat, or permanent loss of foraging resources. Due to the location of the Project in an already developed area with active and consistent agricultural management practices (including cattle grazing and likely fertilizer and pesticide application), potential foraging, nesting, and overwintering habitat is already subject to repeated disturbance or loss. Therefore, any additional loss resulting from the Project would not be substantial. Because this species is a generalist forager that chooses nest and overwintering locations on an annual basis, temporary and permanent loss of habitat resulting from the Project would not be expected to contribute substantially to the overall decline of this species unless direct impacts were to occur to an active nest or overwintering gyne (future queen). Impacts to Crotch bumble bee would be less than significant with the implementation of Mitigation Measures BIO-1 and 4.

The literature review identified five bat species with potential to occur within the Project Area. Western yellow bat has a moderate potential to occur and pallid bat, western mastiff bat, pocketed free-tailed bat, and big-free tailed bat have a low potential to occur. All are CDFW SSC. Suitable roosting habitat is present within the Project Area in the form of abandoned buildings and tree species (e.g., palm and eucalyptus species). The presence of water in the waste management basins provides suitable foraging habitat for bats as they harbor or attract prey for these species such as insects. Additionally, suitable foraging habitat is present throughout the Project Area in the form of irrigated agricultural fields which attract or provide habitat for insect prey. If bats are found to be roosting within the Project Area, direct impacts can occur in the form of mortality or roost abandonment. Roost abandonment during the maternity season could result in the mortality of flightless young, which could be a violation of California Fish and Game Code Section 4150 as well as a significant impact to a native wildlife nursery site under CEQA. Additionally, activities conducted outside of the maternity season that cause bats to leave a roost during daytime hours pose a mortality risk to individual bats. Indirect impacts from Project activities may also occur in the form of reduced prey base due to loss or modification of foraging habitat. This can be substantial as the potential consequences of traveling longer distances to forage include individual mortality or even failure of a maternity colony, as failure of individuals to gain sufficient weight may result in the inability to migrate, nurse, or hibernate without starving. Impacts to roosting bats would be less than significant with the implementation of Mitigation Measures BIO-1, 5, and 6.

Delhi Sands flower-loving fly (federally listed Endangered) has a low potential to occur within the Project Area. Soil of the Delhi Sand series is present throughout the Project Area; this soil is necessary for the ecology of the Delhi Sands flower-loving fly. Additionally, foraging resources are present within and adjacent to the Project Area in the form of flowering plants. However, suitability of the habitat present within the Project Area for this species is greatly reduced due to ongoing agricultural and farming practices and other anthropogenic factors. If present, direct impacts to Delhi Sands flower-loving fly could occur in the form of injury or mortality due to vehicle or equipment strikes and loss of habitat. If present, indirect impacts to this species may occur in the form of increased human activity, noise, dust, and ground vibrations. Impacts to this species, if present, in the Project Area would be considered a significant impact under CEQA because of its status as a federally listed species. Impacts to Delhi Sands flower-loving fly, if present, would be reduced to less than significant with the implementation of Mitigation Measures BIO-1 and 7.

Tricolored blackbird (state-listed Threatened), Swainson's hawk (state-listed Threatened), and white-tailed kite (CDFW Fully Protected) have a low potential to occur within the Project Area. Suitable breeding and foraging habitat for tricolored blackbird is present throughout the Project Area in the form of agricultural fields (e.g., corn fields) and open water waste management basins. Although it is marginally suitable habitat, tricolored blackbird is known to nest and forage in agricultural fields. Suitable breeding and foraging habitat for Swainson's hawk and white-tailed kite is present in the form of tall eucalyptus trees and agricultural fields. The potential for occurrence of Swainson's hawk within the Project Area is reduced due to the southernmost extent of its breeding range being in the high desert. The suitability of habitat for these three species is greatly reduced in the Project Area due to anthropogenic factors. If present, direct impacts to these species could occur in the form of injury or mortality due to vehicle or equipment strikes, nest failure, and loss of habitat. If present, indirect impacts to these species may occur in the form of increased human activity, noise, dust, nighttime lighting, and ground vibrations. Impacts to these species, if present, in the Project Area could be considered a significant impact under CEQA. Impacts to white-tailed kite, tricolored blackbird, and Swainson's hawk, if present, would be reduced to less than significant with the implementation of Mitigation Measures BIO-1 and 8.

Two additional species have a low potential to occur within the Project Area: coastal whiptail (CDFW SSC) and Los Angeles pocket mouse (CDFW SSC). If present, direct impacts to these species could occur in the form of injury or mortality due to vehicle or equipment strike or entombment inside of burrows that are graded over during construction, and loss of habitat. If present, indirect impacts to these species could occur in the form of increased human activity, noise, dust, nighttime lighting, and ground vibrations. These species have a low probability of occurring in the Project Area, and if present, these species are not expected to occur at high densities due to the highly disturbed nature of the site and recent mechanical disturbances to the soil affecting habitat or prey base for these species. The potential loss of the coastal whiptail or Los Angeles pocket mouse individuals in the Project Area would not be expected to contribute to the decline in regional populations and would therefore not be considered a significant impact under CEQA. The remaining 36 special-status wildlife species are presumed absent from the Project Area or areas adjacent to the Project Area due to the lack of suitable habitat and ongoing disturbances within and adjacent to the Project Area. No impacts to the 36 presumed absent special-status wildlife species are anticipated to result from the development of this Project.

Numerous tree and shrub species, including tall eucalyptus trees and ornamental species, are present within and immediately adjacent to the Project Area. These can provide nesting habitat for nesting songbirds and raptors protected by the MBTA and California Fish and Game Code. Furthermore, the Project Area can provide nesting habitat for ground-nesting bird species such as mourning dove (*Zenaida* *macroura*). If construction of the Proposed Project occurs during the bird breeding season (typically February 1 through August 31), ground-disturbing construction activities could directly affect birds protected by the MBTA and their nests through the removal of occupied habitat (e.g., destruction of nests, mortality of flightless juveniles) in the Project Area, and indirectly through increased noise, vibrations, increased lighting/glare, and increased human activity. These impacts to nesting songbirds and raptors would be less than significant with the implementation of Mitigation Measures BIO-1 and 8.

5.2 Sensitive Natural Communities

No sensitive natural communities, according to classifications described in Sawyer et al. (2009) and by CDFW, were identified within the Project Area. Rather, four land cover types are present within the Project Area: Agriculture, Developed, Disturbed, and Open Water. During the biological survey, sparsely distributed individuals of mulefat and black willows, ranging from one to three individuals each, were documented within the offsite improvement area in association with the areas mapped as Agriculture land use. Due to their small size and sparse nature, these individuals were not large or established enough to be mapped as a vegetation community. Additionally, these individuals are not considered a sensitive natural community. As such, no impacts to sensitive natural communities are anticipated as a result of the Project.

5.3 State and Federally Protected Wetlands and Waters of the United States

The constructed basins identified within the Project Area were evaluated as being non-jurisdictional to USACE, RWQCB, or CDFW. Any Project related impacts to the basins, including grading and depositing of fill material, would not be considered significant under CEQA.

The Cucamonga Creek Flood Control Channel, located outside of the Project Area, is an aquatic feature that is potentially jurisdictional to the USACE, RWQCB, and/or CDFW. The Cucamonga Creek Flood Control Channel is located more than 50 feet from the Project Area and no direct Project impacts to this potentially regulated feature are anticipated. To further ensure no direct impacts occur to Cucamonga Creek Flood Control Channel, it is recommended that the Project Area be delineated with construction fencing in the vicinity of the channel to prevent encroachment of Project activities into the area immediately adjacent to the channel.

Although direct impacts are not expected to occur to the Cucamonga Creek Flood Control Channel, Project-related indirect impacts could occur in the form of runoff and erosion. Because the Project is more than 1 acre in size, the applicant will be required to obtain coverage under the General Construction Storm Water Permit from the RWQCB by preparing a Storm Water Pollution Prevention Plan (SWPPP) and implementing Best Management Practices (BMPs) to reduce water quality effects during construction. Implementation of the BMPs would reduce indirect impacts to the Cucamonga Creek Flood Control Channel to a less than significant level.

5.4 Wildlife Corridors and Nursery Sites

The Project Area is located within and adjacent to areas containing existing disturbances (e.g., paved roads, major highways, residential and commercial development, and agricultural/farming practices). Despite these disturbances, the Project Area does contain open areas and resources that can provide limited movement opportunities in the immediate vicinity of the Project Area. Additionally, to the east of the Project Area is the Cucamonga Creek Flood Control Channel that may also provide limited movement opportunities for wildlife. Despite these characteristics, the Project Area is completely surrounded by urban development and anthropogenic disturbances and provides no connection between large, contiguous blocks of native habitat in the region. Additionally, the Cucamonga Creek Flood Control Channel, located approximately 60 feet east of the eastern boundary of the Project site, is concrete-lined and does not provide native habitat that is conducive to local or regional wildlife movement. Due to its isolation and lack of vegetative cover, no wildlife corridors or linkages are present within the Project Area and no impacts to these resources are expected to occur as a result of the Project.

Suitable bat roosting habitat was identified within the Project Area in the form of abandoned buildings and trees. Should bats be found roosting in these features during the bat maternity season (April 1 through August 31), these roosts would be considered native wildlife nursery sites and are protected under CEQA. Direct impacts to occupied bat roosts could include removal or destruction that could result in direct mortality, indirect impacts from noise, dust, and vibration during Project construction could result in roost abandonment and mortality of flightless young. Impacts to maternity bat roosts would be less than significant with the implementation of Mitigation Measures BIO-5 and 6.

5.5 City of Ontario—Tree Preservation Policy and Protection Measures

No native trees or heritage trees, according to the definitions provided in §§6.05.020 of the City of Ontario Development Code, were observed within the Project Area. No impacts to these resources are expected to occur as a result of the Project.

6.0 MITIGATION MEASURES AND RECOMMENDATIONS

The following mitigation measures are recommended prior to Project implementation:

BIO-1 **Worker Environmental Awareness Program and Biological Monitor:** Prior to the start of construction, a Worker Environmental Awareness Program (WEAP) will be developed by the City or the City's consultant. A qualified biologist with experience with the sensitive biological resources in the region will present the WEAP to all personnel working in the Project Area (either temporarily or permanently) prior to the start of Project activities. The WEAP may be videotaped and used to train newly hired workers or those not present for the initial WEAP. The WEAP could include but will not be limited to discussions of the sensitive biological resources associated with the Project, Project-specific measures to avoid or eliminate impacts to these resources, consequences for not complying with Project permits and agreements, and contact information for the lead biologist. Logs of personnel who have taken the training will be kept on the site at the construction or Project office.

In addition to a WEAP, a qualified biologist (biological monitor) with experience monitoring for and identifying sensitive biological resources known to occur in the area will be present during initial ground-disturbing activities related to the Project (including fence installation and vegetation removal activities). As required by Project permits, the qualifications of a biological monitor may need to be submitted to appropriate wildlife agencies for approval based on the resources the biologist will be monitoring. Biological monitoring duties will include, but are not limited to, conducting worker education training, verifying compliance with Project permits, and ensuring Project activities stay within designated work areas.

The biological monitor will have the right to halt all activities in an affected area if a special-status species is identified in a work area and is in danger of injury or mortality. If work is halted by the biological monitor, work will proceed only after the hazards to the individual is removed and there is no longer a risk to the individual, or the individual has been moved from harm's way in accordance with the Project's permits and/or management/translocation plans. The biological monitor will take representative photographs of the daily activities and will also maintain a daily log that documents general Project activities and compliance with the Project's permit conditions. Non-compliances will also be documented in the daily log, including any measures that were implemented to rectify the issue.

BIO-2 **Rare Plant Survey:** A rare plant survey shall be conducted within suitable habitat on the Project site during the appropriate blooming period for the lucky morning-glory (March through September) and smooth tarplant (April through September). The survey shall be conducted by a botanist or qualified biologist in accordance with the USFWS Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants; the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities; and the CNPS Botanical Survey Guidelines of the CNPS. One survey will be conducted during a time of the year that overlaps with all blooming periods (April through September).

If these species are observed during the rare plant survey, individual plants or populations will be marked with GPS for mapping purposes. If any of these special-status plant species are detected in the Project Area and impacts to these species are unavoidable and impacts would result in deleterious effects to the regional population of the species, then the Project will need to consult with CDFW to develop a mitigation plan or additional avoidance and minimization measures to ensure impacts to these plant species are minimized to the maximum extent practicable. Examples of measures that may be implemented after consultation with CDFW include establishing a no-disturbance buffer around locations of individuals or a population or additional monitoring requirements during Project construction.

BIO-3 **Burrowing Owl Management Plan:** A live burrowing owl was documented in the Project Area during a biological survey conducted in September 2023, during at time at which the individual could be migrating, arriving for the winter, or late in leaving its summer breeding grounds. Additionally, suitable burrowing owl habitat is present throughout the Project Area.

In order to offset potential Project-related impacts to burrowing owl and its habitat, a Burrowing Owl Management Plan (BOMP) shall be developed by a qualified Project biologist who has at least three (3) years of experience working with and/or managing burrowing owls on project sites. The BOMP shall outline Project-specific protection measures that are in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* (Staff Report; CDFG 2012). The BOMP shall also identify protection measures to be implemented should the species be found on the Project Site or offsite improvement areas at any time of the year (i.e., migration periods, breeding/summer, and wintering). The BOMP shall outline specific pre-construction survey methods and timing in accordance with the Staff Report and shall include instruction on survey requirements should there be a lapse in construction or Project activities. The BOMP shall include Project activities before which pre-construction survey requirements will be required (such as grading, vegetation removal, and fence installation). Mitigation methods outlined in the BOMP shall include, but not be limited to, establishment of no-disturbance buffers around potential or occupied burrowing owl burrows, additional biological monitoring requirements during Project activities, and passive relocation during the burrowing owl non-breeding season (September 1 through February 28/29, annually). Regular reporting timeframes and requirements for communication with CDFW shall also be clearly outlined in the BOMP. The BOMP shall be submitted to CDFW for review and subject to CDFW approval prior to the start of Project ground-disturbing activities.

Additionally, the City of Ontario will continue to carry out the requirements of its Memorandum of Agreement (MOA) with IERCD (dated November 21, 2023) to mitigate the loss of suitable burrowing owl habitat resulting from the Project. The MOA outlines the collection of Habitat Mitigation Fees by the City of Ontario that will be managed by a Land Trust for the acquisition, restoration, rehabilitation, and maintenance of lands selected by the Land Trust to have long-term conservation value for burrowing owl.

BIO-4 **Preconstruction Surveys for Crotch Bumble Bee:** If the Crotch bumble bee is no longer a Candidate or formally listed species under the California ESA at the time ground-disturbing activities occur, then no additional protection measures are proposed for the species.

If the Crotch bumble bee is legally protected under the California ESA as a Candidate or Listed species at the time ground-disturbing activities are scheduled to begin, preconstruction surveys shall be conducted in accordance with CDFW's Survey Considerations for California ESA Candidate Bumble Bee Species (CDFW 2023d) the season immediately prior to Project-related ground disturbing activities (including but not limited to vegetation clearing, fence installation, and grading). A minimum of three Crotch bumble bee preconstruction surveys shall be conducted at two- to four-week intervals during the colony active period (April through August) when Crotch bumble bees are most likely to be detected. Non-lethal, photo voucher surveys shall be completed by a biologist who holds a Memorandum of Understanding to capture and handle Crotch bumble bee (if nesting and chilling protocol is to be utilized) or by a CDFW approved biologist experienced in identifying native bumble bee species (if surveys are restricted to visual surveys that will provide high-resolution photo documentation for species verification). The surveyor shall walk through all areas of suitable habitat focusing on areas with floral resources. Surveys shall be completed at a minimum of one person-hour of searching per three acres of suitable habitat during suitable weather conditions (sustained winds less than 8 mph, mostly sunny to full sun, temperatures between 65 and 90ºF) at an appropriate time of day for detection (at least an hour after sunrise and at least two hours before sunset, though ideally between 9:00 a.m. and 1:00 p.m.).

If Crotch bumble bees are detected, CDFW shall be notified by the designated biologist as further coordination may be required to avoid or mitigate certain impacts. At a minimum, two nesting surveys shall be conducted with focus on detecting active nesting colonies within one week and 24 hours immediately prior to ground disturbing activities that are scheduled to occur during the flight season (February through October). If an active Crotch bumble bee nest is detected, an appropriate no disturbance buffer zone (including foraging resources and flight corridors essential for supporting the colony) shall be established around the nest to reduce the risk of disturbance or accidental take and the designated biologist shall coordinate with CDFW to determine if an Incidental Take Permit under Section 2081 of the California ESA will be required. Nest avoidance buffers may be removed at the completion of the flight season and/or once the qualified biologist deems the nesting colony is no longer active and CDFW has provided concurrence of that determination. If no nests are found but the species is present, a full-time qualified biological monitor shall be present during vegetation or ground disturbing activities that are scheduled to occur during the queen flight period (February through March), colony active period (March through September), and/or gyne flight period (September through October). Because bumble bees move nest sites each year, two preconstruction nesting surveys shall be required during each subsequent year of construction, regardless of the previous year's findings, whenever vegetation and ground disturbing activities are scheduled to occur during the flight season if nesting and foraging habitat is still present or has re-established.

BIO-5 **Bat Management Plan:** A Bat Management Plan shall be prepared by a qualified bat biologist prior to the commencement of Project-related activities (including, but not limited to, structure removal or demolition, tree removal, grading, and vegetation removal) that will include specific avoidance and minimization measures to reduce impacts to roosting bats. The Project-specific Bat Management Plan may include any of the following as necessary and appropriate: additional habitat assessments of inaccessible areas that would be directly or indirectly impacted during Project activities, emergence and/or acoustic surveys for bats during the maternity season (April 1 through August 31) to assess the potential for bat maternity roosts in the Project Area, and pre-construction surveys for roosting bats including acoustic monitoring. The Bat Management Plan shall also include recommendations to minimize impacts to roosting bats including the implementation of no-disturbance buffers, tree- and cliff-swallow nest removal protocols, passive exclusion of bats outside of the maternity and hibernation seasons (if impacts are unavoidable), and/or species-specific replacement alternative roosting habitat.

BIO-6 **Tree Avoidance and Removal Process.** If trees are scheduled to be removed (e.g., relocating)/modified (i.e., trimming) that were determined to be suitable for bat roosting, these activities shall be scheduled during one of the seasonal periods of bat activity, listed below, and when evening temperatures are not below 45ºF and rain is not over 0.5 inch in 24 hours:

- September 1 to October 31 (preferred): This is after the maternity season but prior to winter torpor.
- February 15 to March 31: After winter torpor but prior to the start of the maternity season.

1. If trees with suitable bat roosting habitat are scheduled for removal or relocation outside of the maternity season, tree removal during the time periods and weather parameters described above using the two-step method shall be conducted:
   a. Prior to the two-step method, as much as feasible, vegetation and trees within the area that are not suitable for roosting bats will be removed first to provide a disturbance that might reduce the likelihood of bats using the habitat.
   b. Two-step tree removal will occur over two consecutive days under the supervision of a qualified bat biologist. On Day 1, small branches and small limbs containing no cavity, crevice or exfoliating bark habitat on habitat trees (or outer fronds in the case of palm trees), as identified by a qualified bat biologist are removed first, using chainsaws only (i.e., no dozers, backhoes). The following day (Day 2), the remainder of the tree is to be felled/removed. (The intention of this method is to disturb the tree with noise and vibration and branch removal on Day 1. This should cause any potentially present day-roosting bats to abandon the roost tree after they emerge for nighttime foraging. Removing the tree quickly the next consecutive day should avoid reoccupation of the tree by bats).
2. If tree removal/modification must occur during the maternity season (April 1 to August 31), a qualified bat biologist shall conduct a focused emergence survey(s) of the tree(s) within 48 hours of scheduled work. If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until after the maternity season or until a qualified biological monitor has determined the roost is no longer active.

BIO-7 **Delhi Sands Flower-Loving Fly Habitat Suitability Assessment:** Prior to the start of ground-disturbing activities (including vegetation removal and fence installation activities), a habitat assessment will be performed within the Project Area and adjacent areas by a USFWS-permitted biologist with a 10(a)(1)(A) permit to conduct surveys for Delhi Sands flower-loving fly and with extensive knowledge of the species. The purpose of the habitat assessment will be to determine the presence of suitable habitat for the species within the Project Area and adjacent areas as well as ascertain the potential for the species to occur on or adjacent to the Project Area. The habitat assessment will include a site walkover, a check of adjacent empty lots for comparison of habitat quality to the Project Area, photographs to document the site conditions, and characterizing the type and quality of the habitats within the Project Area with respect to Delhi Sands flower-loving fly.

At the conclusion of the habitat assessment, a brief report of findings as well as recommendations on whether focused surveys must be conducted will be prepared by the USFWS-permitted biologist. The report shall also include any additional applicable Project-specific avoidance, minimization, and mitigation measure recommendations for the species. The Project shall follow the recommendations identified in the report of findings.

If Delhi Sands flower-loving fly is present in the Project Area and impacts to the species are unavoidable, then the Project must initiate consultation with USFWS under either Section 7 or 10 of the federal ESA. If suitable habitat is identified in the Project Area, then the City of Ontario will continue to carry out the requirements of its MOA with IERCD to mitigate for loss of Delhi Sands flower-loving fly habitat. This MOA outlines the collection of Habitat Mitigation Fees by the City of Ontario that will be managed by a Land Trust for the acquisition, restoration, rehabilitation, and maintenance of lands selected by the Land Trust to have long-term conservation value for species such as Delhi Sands flower-loving fly. Up to 25-percent of the total Mitigation Fee collected may be used for the recovery of the Delhi Sands flower-loving fly.

BIO-8 **Preconstruction Survey for Nesting Birds:** If ground-disturbing Project activities (e.g., grubbing, vegetation removal, grading, fence installation) are scheduled to occur during the nesting bird and raptor season (generally February 1 through August 31), a preconstruction nesting bird and raptor survey shall be conducted by a qualified avian biologist to ensure that active bird nests will not be disturbed or destroyed. The survey shall be completed no more than three days prior to initial ground disturbance. The nesting bird survey shall include the Project Area and adjacent areas where Project activities have the potential to affect active nests, either directly or indirectly, due to construction activity, noise, human activity, or ground disturbance.

If an active nest is identified, a qualified avian biologist shall establish an appropriately sized non-disturbance buffer around the nest using flagging or staking. Construction activities shall not occur within any non-disturbance buffer zones until the nest is deemed inactive by the qualified avian biologist. If initial ground-disturbing activities are scheduled to occur during the nesting bird season, then a biological monitor shall be present during all vegetation removal activities to ensure no impacts to nesting birds occur.

If any special-status avian species is identified during the preconstruction survey and Project-related impacts are unavoidable, consultation with the appropriate agency (e.g., USFWS, CDFW) may need to occur to develop additional avoidance and minimization measures.

6.1 Additional Recommendations

6.1.1 Lighting/Glare

The Project is located within an urban environment with pre-existing light pollution from adjacent development (e.g., Whispering Lakes Golf Course, paved roadways, residential development). However, the Project will result in an increase in lighting/glare due to stadium lighting. Although light pollution is not a novel addition to the Project's vicinity, it is recommended that to reduce the potential indirect impacts of increased lighting/glare from the Project to sensitive biological resources such as nesting birds and roosting bats, the following guidance be implemented:

- Eliminate all non-essential lighting;
- Avoid or limit use of lighting during dawn and dusk hours;
- Install shields on lights to reduce overpour into adjacent areas;
- Direct light downward;
- Incorporate light with warmer color temperatures; and
- Reduce light intensity where feasible.

6.1.2 Recommended Practices

The following recommended practices are not mitigation measures pursuant to CEQA but are recommended to further reduce impacts to species that have potential to occur on the property:

- To prevent encroachment into areas immediately adjacent to the Cucamonga Creek Flood Control Channel, temporary fencing should be installed along the eastern perimeter of the Project site.
- Confine all work activities to a predetermined work area.
- To prevent inadvertent entrapment of wildlife during the construction phase of the Project, all excavated, steep-walled holes or trenches more than 2 feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen fill or wooden planks shall be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals.
- Wildlife are often attracted to burrow- or den-like structures such as pipes and may enter stored pipes and become trapped or injured. To prevent wildlife use of these structures, all construction pipes, culverts, or similar structures with a diameter of four inches or greater should be capped while stored onsite.
- All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from the construction or Project Area.

- Use of rodenticides and herbicides on the Project Area should be implemented in a manner that reduces the potential for primary or secondary poisoning of non-target species. This is necessary to prevent poisoning of non-target species, including special-status species, and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the USEPA, California Department of Food and Agriculture, and other state and federal legislation. If rodent control must be conducted, zinc phosphide should be used because it has a proven lower risk to predatory wildlife.

7.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field work conducted for this assessment was performed by me or under my direct supervision. I certify that I have not signed a non-disclosure or consultant confidentiality agreement with the Project applicant or the applicant's representative and that I have no financial interest in the Project.

SIGNED: DATE:

March 12, 2024

For Corrina Tapia
Associate Biologist
ECORP Consulting, Inc.

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LIST OF APPENDICES

APPENDIX A

Representative Site Photographs

Photo 1. Agriculture in the Northwest Portion of the Project Area. Facing southwest.

Photo 2. Debris Pile- Suitable for Burrowing Owl Refugia Located in the Northeast Portion of the Project Area. Facing west.

Photo 3. Occupied Burrowing Owl Burrow with Sign (i.e., Pellet and Live Owl) Located Near the Active Dairy Farm in the Northeast Portion of the Project Area. Facing west.

Photo 4. Agriculture (i.e., corn) in Southwest Portion of the Project Area. Facing north.

Photo 5. Northwest Portion of the Project Area. Facing west.

Photo 6. Northeast Portion of the Project Area. Facing East. Agriculture to the North.

Photo 7. Disturbed Land in the Northeast Portion of the Project Area. Facing West. Past Signs of Disturbance (e.g., Discing) Evident.

Photo 8. Open Water (i.e., Detention Basin) in the Northeastern Portion of the Project Area (on Active Dairy Farm). Facing north.

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Photo 18. Stand of Eucalyptus Trees South of Schaefer Avenue and within the Project Area. Facing south.

Photo 20. Excavated Basin located north of Edison Avenue and within the Project Area; individuals of Mulefat and Black Willow. Facing east.

Photo 21. Irrigation Pipes Feeding into the Excavated Basin located north of Edison Avenue and within the Project Area.

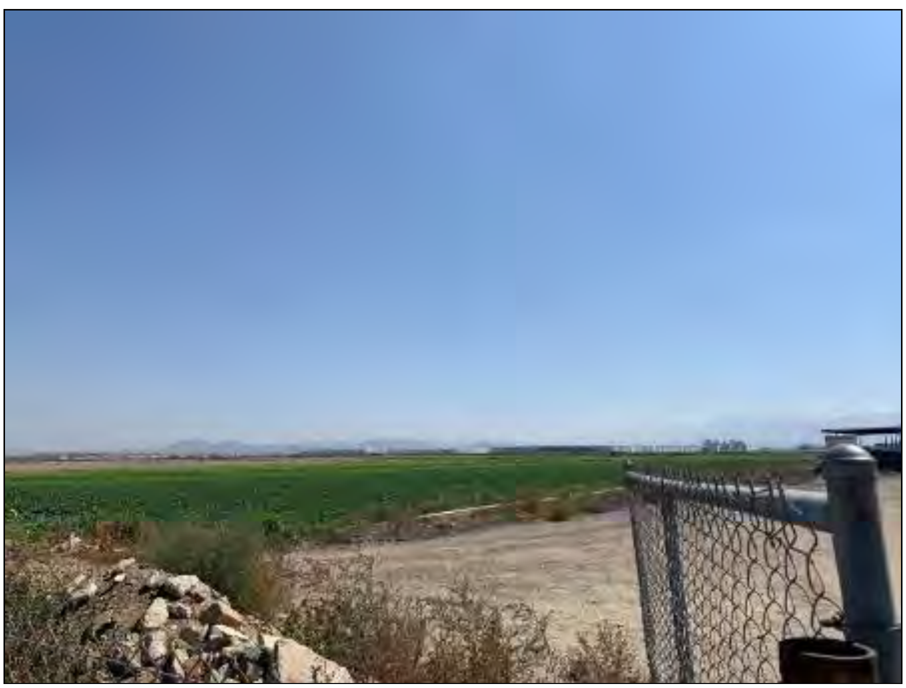

Photo 22. Agriculture south of Edison Avenue and within the Project Area. Facing southeast.

Photo 23. Agriculture north of Eucalyptus Avenue and south of Edison Avenue within the Project Area. Facing north.

Photo 24. Agriculture and Development north of Eucalyptus Avenue and south of Edison Avenue within the Project Area. Facing south.

APPENDIX B

Plant Species Observed

Scientific Name	Common Name
VASCULAR PLANTS	
GYMNOSPERMS	
Cupressaceae	Cypress Family
*Cupressus sempervirens**	Italian Cypress
ANGIOSPERMS (DICOTS)	
Aizoaceae	Ice plant Family
*Delosperma cooperi**	Hardy ice plant
Anacardiaceae	Cashew Family
*Schinus molle**	Peruvian peppertree
Asteraceae	Sunflower Family
Baccharis salicifolia	Mulefat
Erigeron bonariensis	Flax-leaved horseweed
Helianthus sp.	Sunflower species
*Verbesina encelioides**	Cowpen daisy
Chenopodiaceae	Goosefoot Family
*Chenopodium album**	Common lambs quarters
*Chenopodium murale**	Nettle leaf goosefoot
*Salsola tragus**	Russian thistle
Euphorbiaceae	Spurge Family
Euphorbia sp.	Spurge species
*Ricinus communis**	Castor bean
Geraniaceae	Geranium Family
*Erodium cicutarium**	Redstem filaree
Lythraceae	Loosestrife Family
*Lagerstroemia indica**	Crepe myrtle
Malvaceae	Mallow Family
*Malva parviflora**	Cheeseweed mallow
Myrtaceae	Myrtle Family
Eucalyptus sp.*	Eucalyptus species
Oleaceae	Olive Family
*Olea europaea**	Common olive
Salicaceae	Willow Family
Salix gooddingii	Gooding's willow
Salix sp.	Willow species
Solanaceae	Nightshade Family
Datura wrightii	Jimson weed
*Nicotiana glauca**	Tree tobacco

Scientific Name	Common Name
Solanum sp.	Solanum species
Urticaceae	Nettle Family
*Urtica dioica**	Stinging nettle
*Urtica urens**	Annual stinging nettle
Zygophyllaceae	Caltrop Family
*Tribulus terrestris**	Puncture vine
ANGIOSPERMS (MONOCOTS)	
ARECACEAE	Palm Family
*Syagrus romanzoffiana**	Queen palm
*Washingtonia robusta**	Mexican Fan palm
Poaceae	Grass Family
*Avena fatua**	Wild oat
*Bromus madritensis**	Foxtail chess
*Echinochloa crus-galli**	Barnyard grass
Leptochloa fusca	Sprangletop
*Zea mays**	Corn

*Nonnative species

APPENDIX C

Wildlife Species Observed

SCIENTIFIC NAME	COMMON NAME
INSECTS	
Erebidae	Erebid Moths
Estigmene arcea	salt marsh moth
REPTILES	
Iguanidae	Iguanids
Uta stansburiana	common side-blotched lizard
BIRDS	
Accipitridae	Hawks and Eagles
Accipiter cooperii	Cooper's hawk
Buteo jamaicensis	red-tailed hawk
Anatidae	Ducks
Anas platyrhynchos	mallard
Spatula clypeata	northern shoveler
Cathartidae	Vultures
Cathartes aura	turkey vulture
Charadriidae	Plovers, Dotterels, and Lapwings
Charadrius vociferus	killdeer
Columbidae	Pigeons and Doves
*Columba livia**	rock pigeon
*Streptopelia decaocto**	Eurasian collared-dove
Zenaida macroura	mourning dove
Corvidae	Crows, Jays, and Magpies
Corvus brachyrhynchos	American crow
Corvus corax	common raven
Falconidae	Falcons
Falco sparverius	American kestrel
Fringillidae	Finches
Haemorhous mexicanus	house finch
Spinus psaltria	lesser goldfinch
Icteridae	New World Blackbirds
Agelaius phoeniceus	red-winged blackbird
Euphagus cyanocephalus	Brewer's blackbird
Quiscalus mexicanus	great-tailed grackle
Parulidae	Wood Warblers
Leiothlypis celata	orange-crowned warbler
Passerellidae	New World Sparrows
Passerculus sandwichensis	savannah sparrow
Passeridae	Old World Sparrows
*Passer domesticus**	house sparrow

SCIENTIFIC NAME	COMMON NAME
Phasianidae	Pheasants, Partridges, and Allies
Pavo sp.*fa	peacock
Recurvirostridae	Stilts and Avocets
Himantopus mexicanus	black-necked stilt
Scolopacidae	Sandpipers
Calidris minutilla	least sandpiper
Tringa flavipes	lesser yellowlegs
Tringa melanoleuca	Greater yellowlegs
Sturnidae	Starlings
*Sturnus vulgaris**	European starling
Strigidae	Owls
Athene cunicularia [SSC]	burrowing owl
Threskiornithidae	Ibises and Spoonbills
Plegadis chihi	white-faced ibis
Tyrannidae	Tyrant Flycatchers
Sayornis nigricans	Black phoebe
Sayornis saya	Say's phoebe
MAMMALS	
Bovidae	Cattle, Goats, and Sheep
*Bos taurus**	domestic cattle
Canidae	Dogs, Wolves, and Foxes
*Canis lupus familiaris**	domestic dog
Felidae	Cats
*Felis catus**	feral cat
Rodentia	Rodents
Rodentia sp.	Rodent sp. (carcass)
Sciuridae	Squirrels
Otospermophilus beecheyi	California ground squirrel

*Nonnative species
SSC: California Department of Fish and Wildlife Species of Special Concern

APPENDIX D

Special-Status Plant Species Potential for Occurrence

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Abronia villosa var. *aurita* chaparral sand-verbena	Fed: Ca: CRPR:	none none 1B.1	(Jan) Mar- Sep 245-5,250	Occurs in sandy soils within chaparral, coastal scrub, and desert dunes. Threatened by non-native plants, changes to fire regimes, development, and vehicles and road maintenances.	**Presumed Absent:** No habitat for this species is present within the Project Area. Two recent and two historic occurrences were documented in CNDDB; none were within 5 miles of the Project Area.
Allium marvinii Yucaipa onion	Fed: Ca: CRPR:	none none 1B.2	Apr-May 2,493-3,494	Occurs in openings within Chaparral in clay soils. Known only from the Yucaipa and Beaumont area of the southern San Bernardino Mountains.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Two historic occurrences were documented in CNDDB; none were within 5 miles of the Project Area.
Allium munzii Munz's onion	Fed: Ca: CRPR:	**END** **THR** 1B.1	Mar-May 974- 3,510	Occurs in chaparral, cismontane woodland, coastal scrub, pinyon and juniper woodland, and valley and foothill grassland in mesic clay soils.	**Presumed Absent:** No habitat for this species (including elevation factors) is present within the Project Area. One historic and two recent occurrences were documented in CNDDB; none were within 5 miles of the Project Area.
Ambrosia monogyra singlewhorl burrobrush	Fed: Ca: CRPR:	none none 2B.2	Aug- Nov 35-1,640	Occurs in sandy soils within chaparral and Sonoran desert scrub. Possibly threatened by non-native plants and trail maintenance.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Ambrosia pumila San Diego ambrosia	Fed: Ca: CRPR:	**END** none 1B.1	Apr-Oct 65-1,360	Occurs in chaparral, coastal scrub, valley and foothill grassland, vernal pools. Often found in disturbed areas. Sometimes found in alkaline, clay, loamy, and sandy soils. Threatened by development, non-native plants, vehicles, road maintenance, and foot traffic.	**Presumed Absent:** Although marginal suitable habitat exists in the form of disturbed habitat, primarily in the form of fallow agricultural fields and disturbed dirt roads, this species is presumed absent. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area. Further, Calflora does not show this species' range extending into San Bernardino County.
Aphyllon validum ssp**.** *Validum* Rock Creek broomrape	Fed: Ca: CRPR:	none none 1B.2	May-Sep 4,104-6,561	Occurs in granitic substrates within chaparral and pinyon and juniper woodland.	**Presumed Absent:** No habitat (including elevation factors) for this species occurs within the Project Area. Two historic occurrences were documented in CNDDB; none were within 5 miles of the Project Area.
Arctostaphylos glandulosa ssp**.** *Gabrielensis* San Gabriel manzanita	Fed: Ca: CRPR:	none none 1B.2	March 1,952-4,921	Occurs in chaparral in rocky soils. Known only from Mill Creek Summit divide in the San Gabriel Mountains.	**Presumed Absent:** No habitat (including elevation factors) for this species occurs within the Project Area. Four historic occurrences were documented in CNDDB; none were within 5 miles of the Project Area.
Arenaria paludicola marsh sandwort	Fed: Ca: CRPR:	**END** **END** 1B.1	May-Aug 9-557	Occurs in freshwater or brackish marshes and swamps in sandy openings. Known only from two natural occurrences in Black Lake Canyon and at Oso Flaco Lake.	**Presumed Absent:** No habitat (including elevation factors) for this species occurs within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Astragalus brauntonii Braunton's milk-vetch	Fed: Ca: CRPR:	**END** none 1B.1	Jan-Aug 15-2,100	Occurs in chaparral, coastal scrub, valley and foothill grassland. Sometimes found in recent burns, disturbed areas, usually in sandstone with carbonate layers. Threatened by development, vegetation/fuel management activities, and alteration of local fire regimes.	**Presumed Absent:** Although marginal disturbed habitat, primarily in the form of fallow agricultural fields and disturbed dirt roads, is present for this species within the Project Area, this species is presumed absent. Six recent occurrences were documented in CNDDB however, none were within 5 miles of the Project Area. Additionally, these occurrences were documented in recently burned areas with habitat features dissimilar to those within the Project Area.
Atriplex coulteri Coulter's saltbush	Fed: Ca: CRPR:	none none 1B.2	Mar-Oct 10-1,510	Occurs in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland. Sometimes found in alkaline and clay soils.	**Presumed Absent:** No habitat for this species occurs within the Project Area. One historic occurrence (OCC 14) was documented in CNDDB in 1917 approximately 4 miles southwest of the Project Area.
Baccharis malibuensis Malibu baccharis	Fed: Ca: CRPR:	none none 1B.1	Aug 490-1,000	Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland.	**Presumed Absent:** No habitat for this species is present within the Project Area. Three recent occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Berberis nevinii Nevin's Barberry	Fed: Ca: CRPR:	**END** **END** 1B.1	Feb(Mar)-Jun 230-2,705	Occurs in chaparral, cismontane woodland, coastal scrub, and riparian scrub in sandy or gravelly soils.	**Presumed Absent:** No habitat for this species is present within the Project Area. Three historic and one recent occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.
Calochortus clavatus var. *gracilis* slender mariposa-lily	Fed: Ca: CRPR:	none none 1B.2	Mar-Nov 1,049-3,280	Occurs in chaparral, coastal scrub, and valley and foothill grassland.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Two historic and three recent occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Calochortus weedii var. *intermedius* intermediate mariposa-lily	Fed: Ca: CRPR:	none none 1B.2	May-Jul 345-2,805	Occurs in rocky calcareous soils within chaparral, coastal scrub, and valley and foothill grasslands. Threatened by development, non-native plants, road construction, fuel modification and potentially by frequent wildfires and horticultural collecting.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Calystegia felix lucky morning-glory	Fed: Ca: CRPR:	none none 1B.1	Mar-Sep 100-705	Occurs in meadows and seeps and alluvial riparian scrub. Historically associated with wetlands and marshes but possibly in drier habitats as well Recent occurrences are known from irrigated landscapes. Sometimes found in alkaline and silty loam soils. Threatened by transmission line development, housing development, urbanization, and potentially by hydrological alterations, weeding, and herbicide application.	**Moderate Potential:** Marginal habitat for this species is present within the Project Area. Three recent and one historic occurrence were documented in CNDDB within approximately 5 miles of the Project Area. The nearest occurrence was documented in 2015 (OCC 2) approximately 2 miles west of the Project Area. The most recent occurrence was in 2017 (OCC 4) approximately 5 miles west of the Project Area.
Calystegia sepium ssp. *Binghamiae* Santa Barbara morning-glory	Fed: Ca: CRPR:	none none 1A	August 15	Occurs in marshes and swamps in coastal areas.	**Presumed Absent:** No habitat for this species is present within the Project Area. No occurrences were documented in CNDDB in the vicinity of the Project Area.
Centromadia pungens ssp. *laevis* smooth tarplant	Fed: Ca: CRPR:	none none 1B.1	Apr-Sep 0-2,100	Occurs in alkaline soils in chenopod scrub, meadows and seeps, playas, riparian woodlands, and valley and foothill grassland. Threatened by foot traffic, agriculture, road maintenance, disking, urbanization, hydrological alterations, and flood control projects.	**Low Potential:** This species is known to occur in disturbed areas. Marginal disturbed habitat, primarily in the form of fallow agricultural fields and disturbed dirt roads, is present for this species throughout the Project Area. Three historic and one recent occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Chloropyron maritimum ssp. *maritimum* salt marsh bird's-beak	Fed: Ca: CRPR:	**END** **END** 1B.2	May-Oct 0-98	Occurs in coastal dunes and in coastal salt marshes and swamps.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Chorizanthe parryi var**.** *fernandina* San Fernando Valley spineflower	Fed: Ca: CRPR:	none none 1B.1	Apr-Jul 490-4,005	Occurs in sandy soils in Coastal scrub, and valley and foothill grassland habitats.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Chorizanthe parryi var. *parryi* Parry's spineflower	Fed: Ca: CRPR:	none none 1B.1	Apr-Jun 902-4,002	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland habitats in openings in sandy or rocky soils.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Chorizanthe polygonoides var**.** *longispina* long-spined spineflower	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 100-5,020	Occurs often in clay soils of Chaparral, Coastal scrub, Meadows and seeps, Valley and foothill grassland, and Vernal Pools.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Chorizanthe xanti var. *leucotheca* white-bracted spineflower	Fed: Ca: CRPR:	none none 1B.2	Apr-Jun 984-3,937	Occurs on alluvial fans in coastal scrub habitat, Mojavean desert scrub, and pinyon and juniper woodland. Often found in sandy or gravelly soils.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic and three recent occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Cladium californicum California saw-grass	Fed: Ca: CRPR:	none none 2B.2	Jun-Sep 195-5,250	Occurs in alkaline or freshwater marshes and swamps as well as meadows and seeps.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Claytonia peirsonii ssp. *peirsonii* Peirson's spring beauty	Fed: Ca: CRPR:	none none 1B.2	Mar-Jun 4,954-9,005	Occurs in subalpine coniferous forests and upper montane coniferous forests in scree soils. Known only from the San Gabriel Mountains.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Two recent occurrences were documented in CNDDB however, neither were within 5 miles of the Project Area.
Cryptantha incana Tulare cryptantha	Fed: Ca: CRPR:	none none 1B.3	Jun-Aug 4,690-7,055	Occurs in lower montane coniferous forest and often gravelly and rocky microhabitats.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. No occurrences were documented in CNDDB in the vicinity of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Dodecahema leptoceras slender-horned spineflower	Fed: Ca: CRPR:	**END** **END** 1B.1	Apr-Jun 655-2,495	Occurs in chaparral, cismontane woodland, and alluvial fan coastal scrub in sandy soils.	**Presumed Absent:** No habitat for this species is present within the Project Area. Four historic and one recent occurrence were documented in CNDDB however only one was within 5 miles of the Project Area. OCC 40 was documented in 1905 approximately 5 miles north of the Project Area.
Dudleya multicaulis many-stemmed dudleya	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 50-2,590	Occurs in chaparral, coastal scrub, valley and foothill grasslands. Often found in clay soils. Seriously threatened by development, road construction and maintenance, fire suppression, non-native plants, mining, grazing, recreation, and possibly by military activities.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Eriastrum densifolium ssp. *sanctorum* Santa Ana River woollystar	Fed: Ca: CRPR:	**END** **END** 1B.1	Apr-Sep 300-2,000	Occurs in chaparral and alluvial fan coastal scrub in sometimes sandy or sometimes gravelly soils.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 31 was documented in 2006 approximately 4 miles southeast of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Eriogonum microthecum var. *johnstonii* Johnston's buckwheat	Fed: Ca: CRPR:	None none 1B.3	Jul-Sep 6,000-9,599	Occurs in subalpine coniferous forest and upper montane coniferous forest in rocky soils.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One recent and one historic occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.
Hesperocyparis forbesii Tecate cypress	Fed: Ca: CRPR:	none none 1B.1	Evergreen Tree 260-4,920	Occurs in clay soils of Chaparral and Closed-cone coniferous forests. Sometimes found in Gabbroic soils of these habitats.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Hesperocyparis goveniana Gowen cypress	Fed: Ca: CRPR:	none none 1B.2	Evergreen tree 100-985	Occurs in maritime Chaparral and Closed-cone coniferous forests.	**Presumed Absent:** No habitat for this species is present within the Project Area. No occurrences were documented in CNDDB in the vicinity of the Project Area.
Horkelia cuneata var. *puberula* mesa horkelia	Fed: Ca: CRPR:	none none 1B.1	Feb-Jul(Sep) 70-810	Occurs in maritime chaparral, cismontane woodland, and coastal scrub in sandy or gravelly soils.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however only one was within 5 miles of the Project Area. OCC 13 was documented in 1917 approximately 5 miles north of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	Fed: Ca: CRPR:	none none 1B.1	Feb-Jun 5-4,005	Occurs in marshes and swamps, playas, and vernal pools. Threatened by urbanization, agriculture, road maintenance, and drought.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Lepechinia cardiophylla heart-leaved pitcher sage	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 1,706-4,494	Occurs in closed-cone coniferous forest, chaparral, and cismontane woodland.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Lilium parryi lemon lily	Fed: Ca: CRPR:	none none 1B.2	Jul-Aug 4,002-9,005	Occurs in mesic soils in lower and upper montane coniferous forests, meadows and seeps, and riparian forests.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Linanthus concinnus San Gabriel linanthus	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 4,986-9,186	Occurs in rocky openings in chaparral and upper and lower montane coniferous forests	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Three recent and one historic occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Lycium parishii Parish's desert-thorn	Fed: Ca: CRPR:	none none 2B.3	Mar-Apr 445-3,280	Occurs in coastal scrub and Sonoran desert scrub.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Malacothamnus parishii Parish's bush-mallow	Fed: Ca: CRPR:	none none 1A	Jun-Jul 1,000-1,492	Occurs in chaparral and coastal scrub habitats.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Monardella australis ssp. *jokerstii* Jokerst's monardella	Fed: Ca: CRPR:	none none 1B.1	Jul-Sep 4,429-5,741	Occurs in chaparral, lower montane coniferous forest, secondary alluvial benches along washes and drainages, and steep scree or talus slopes between breccia. Known only from the San Gabriel Mountains.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One recent and one historic occurrence were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 1 was documented in 1952 approximately 4 miles southwest of the Project Area.
Monardella breweri ssp. *glandulifera* Brown's Flat monardella	Fed: Ca: CRPR:	none none 1B.2	May-Aug 4,265-4,920	Occurs in chaparral and lower montane coniferous forest.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Two recent and one historic occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Monardella hypoleuca ssp. *intermedia* intermediate monardella	Fed: Ca: CRPR:	none none 1B.3	Apr-Sep 1,312-4,101	Occurs in chaparral, cismontane woodland, and occasionally in lower montane coniferous forest. Known only from the Santa Ana and Palomar Mountains.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Monardella macrantha ssp. *hallii* Hall's monardella	Fed: Ca: CRPR:	None none 1B.3	Jun-Oct 2,395-7,201	Occurs in valley and foothill grasslands, chaparral, broad-leafed upland forest, cismontane woodland, and lower montane coniferous forest.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One recent and three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Monardella pringlei Pringle's monardella	Fed: Ca: CRPR:	none none 1A	May-Jun 984-1,312	Occurs in sandy soils and coastal scrub. Known from occurrences in Colton.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Muhlenbergia utilis aparejo grass	Fed: Ca: CRPR:	none none 2B.2	Mar-Oct 80-7,630	Occurs in chaparral, cismontane woodland, coastal scrub, marshes, swamps, meadows and seeps. Associated with alkaline and serpentine soils. Threatened by development.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Nama stenocarpa mud nama	Fed: Ca: CRPR:	none none 2B.2	Jan-Jul 15-1,640	Occurs in marshes and swamps, along lake margins and riverbanks.	**Presumed Absent:** No habitat for this species is present within the Project Area. No occurrences were documented in CNDDB in the vicinity of the Project Area.
Navarretia prostrata prostrate vernal pool navarretia	Fed: Ca: CRPR:	none none 1B.2	Apr-Jul 10-3,970	Occurs in mesic soils within coastal scrub, meadows, seeps, vernal pools, and alkaline valley and foothill grasslands.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Nolina cismontana chaparral nolina	Fed: Ca: CRPR:	none none 1B.2	(Mar)May-Jul 460-4,185	Occurs in Chaparral and Coastal scrub habitats. Found sometimes in Gabbroic soils and sometimes Sandstone soils.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Opuntia basilaris var. *brachyclada* short-joint beavertail	Fed: Ca: CRPR:	none none 1B.2	Apr-Jun 1,394-5,905	Occurs in chaparral, Joshua tree woodland, Mojaven desert scrub, and pinyon and juniper woodland.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Oreonana vestita woolly mountain-parsley	Fed: Ca: CRPR:	none none 1B.3	Mar-Sep 5,298-11,482	Occurs in gravelly or talus substrates of lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Penstemon californicus California beardtongue	Fed: Ca: CRPR:	none none 1B.2	May-Jun 3,838-7,545	Occurs in sandy soils found in chaparral, lower montane coniferous forest, and pinyon and juniper woodland. Known in California from less than 20 occurrences.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Pentachaeta aurea ssp. *allenii* Allen's pentachaeta	Fed: Ca: CRPR:	none none 1B.1	Mar-Jun 245-1,705	Occurs in coastal scrub openings, Valley and foothill grassland.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One recent and one historic occurrence were documented in CNDDB however, neither were within 5 miles of the Project Area.
Phacelia keckii Santiago Peak phacelia	Fed: Ca: CRPR:	none none 1B.3	May-Jun 1,788-5,249	Occurs in chaparral and closed-cone coniferous forest. Known only from the Santa Ana and Agua Tibia Mountains.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Phacelia stellaris Brand's star phacelia	Fed: Ca: CRPR:	none none 1B.1	Mar-Jun 5-1,310	Occurs in coastal scrub and dunes. Threatened by development and non-native plants.	**Presumed Absent:** No habitat for this species is present within the Project Area. One recent and one historic occurrence were documented in CNDDB however, neither were within 5 miles of the Project Area.
Pseudognaphalium leucocephalum white rabbit-tobacco	Fed: Ca: CRPR:	none none 2B.2	Jul(Aug)-Nov(Dec) 0-6,890	Occurs in gravelly and sandy soils within chaparral, cismontane woodland, coastal scrub, and riparian woodland. Threatened by non-native plants, recreational activities, and hydrological alterations.	**Presumed Absent:** No habitat for this species is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 46 was documented in 1891 approximately 5 miles northeast of the Project Area.
Sagittaria sanfordii Sanford's arrowhead	Fed: Ca: CRPR:	none none 1B.2	May-Oct(Nov) 0-2,135	Occurs in shallow freshwater of marshes and swamps. Extirpated from southern California, and mostly extirpated from the Central Valley. Threatened by grazing, development, recreational activities, non-native plants, road widening, and channel alteration and maintenance.	**Presumed Absent:** No habitat for this species is present within the Project Area. One recent occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Senecio aphanactis chaparral ragwort	Fed: Ca: CRPR:	none none 2B.2	Jan-Apr (May) 50-2,625	Occurs within chaparral, cismontane woodland, and coastal scrub. Sometimes found in alkaline areas. Threatened by development.	**Presumed Absent:** No habitat for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Sidalcea neomexicana salt spring checkerbloom	Fed: Ca: CRPR:	None none 2B.2	Mar-Jun 50-5,020	Occurs in chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas. Often within alkaline and mesic areas.	**Presumed Absent:** No habitat for this species is present within the Project Area. Three historic occurrences were documented in CNDDB however, only two were within 5 miles of the Project Area. OCC 24 was documented in 1902 approximately 3 miles west of the Project Area. OCC 13 was documented in 1917 approximately 4 miles southwest of the Project Area.
Sphenopholis obtusata prairie wedge grass	Fed: Ca: CRPR:	none none 2B.2	Apr-Jul 984-6,561	Occurs in cismontane woodlands, meadows and seeps.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Symphyotrichum defoliatum San Bernardino aster	Fed: Ca: CRPR:	none none 1B.2	Jul-Nov 5-6,695	Occurs in meadows and seeps, marshes, and swamps, coastal scrub, cismontane woodland, lower montane coniferous forest, and vernally mesic valley and foothill grassland. Often found in disturbed areas and near ditches, streams, and springs.	**Presumed Absent:** No habitat for this species is present within the Project Area. Six historic occurrences were documented in CNDDB however, only three were within 5 miles of the Project Area. OCC 108 was documented in 1928 approximately 1 mile west of the Project Area. OCC 164 was documented in 1918 approximately 3 miles west of the Project Area. OCC 152 was documented in 1995 approximately 5 miles east of the Project Area.

Scientific Name Common Name	Status		Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Symphyotrichum greatae Greata's aster	Fed: Ca: CRPR:	none none 1B.3	Jun-Oct 984-6,889	Occurs in mesic habitats including riparian woodland, broadleaf upland forest, lower montane coniferous forest, cismontane woodland, and chaparral.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. Three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Thysanocarpus rigidus rigid fringepod	Fed: Ca: CRPR:	none none 1B.2	Feb-May 1,970-7,220	Occurs in pinyon and juniper woodland. Found in dry, rocky, and slope microhabitats.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Viola pinetorum ssp. *grisea* grey-leaved violet	Fed: Ca: CRPR:	none none 1B.3	Apr-Jul 4,921-11,154	Occurs in meadows, seeps, subalpine coniferous forests and upper montane coniferous forests.	**Presumed Absent:** No habitat (including elevational factors) for this species is present within the Project Area. One recent occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Yucca brevifolia western Joshua tree	Fed: Ca: CRPR:	none CAN –	–	Occurs in broad valleys where soils are deep, on alluvial or rocky slopes, and on pediments with minimal runoff surrounding desert mountains and mesas.	**Presumed Absent:** No habitat for this species is present within the Project Area. No occurrences were documented in CNDDB in the vicinity of the Project Area.

Scientific Name Common Name	Status	Bloom Period & Elevation (feet)	Habitat Requirements	Potential for Occurrence
Federal Designations: (Federal Endangered Species Act, USFWS) **END**: federally listed, endangered **THR**: federally listed, threatened			**CRPR Ranking** 1A: Presumed extinct 1B: Rare, threatened, or endangered in California and elsewhere 2B: Rare, threatened, or endangered in California, but more common elsewhere 3: Review list of plants requiring more study 4: Plants of limited distribution watch list CBR: Considered but rejected	
State Designations: California Endangered Species Act, CDFW) END: state-listed, endangered THR: state-listed, threatened CAN: Candidate for state listing FP: Fully Protected Species SSC: Species of Special Concern			**CRPR Threat Code** 0.1: Seriously threatened in California 0.2: Fairly threatened in California 0.3: Not very threatened in California	

Source: California Natural Diversity Data Base (CNDDB) California Native Plant Society Electronic Inventory (CNPSEI) Guasti, Corona North, Corona South, Mt. Baldy, Cucamonga Peak, Devore, Fontana, Riverside West, Lake Mathews, Black Star Canyon, and Prado Dam 7.5-minute quads.

APPENDIX E

Special-Status Wildlife Species Potential for Occurrence

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Invertebrates				
Bombus crotchii Crotch bumble bee	Fed: CA:	none CAN	Found in coastal California east to the Sierra-Cascade crest and south into Mexico. Occurs in open grassland and scrub habitats. Prefers a diet consisting of certain plant species including milkweeds, dusty maidens, lupines, medics, phacelias, sages, clarkias, poppies, and wild buckwheats. Nests are often located underground in abandoned rodent nests or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees.	**Moderate Potential.** Activities from the active dairy farm within the Project Area- such as plowing, grazing, fertilizer, and trampling- likely preclude this species from nesting/overwintering in the active agriculture and livestock pens. However, this species has potential to be present along the edges of these areas and in areas less frequently disturbed. Due to the presence of suitable habitat in disturbed fields and the presence of suitable nectaring sources, there is potential for this species to occur within the Project Area. Numerous recent and historic occurrences were documented in CNDDB; however only three were within 5 miles of the Project Area. OCC 247 was documented in 2019 approximately 3 miles northeast of the Project Area. OCC 187 was documented in 1894 approximately 3 miles northwest of the Project Area. OCC 316 was documented in 2020 approximately 3 miles northeast of the Project Area.
Euphydryas editha quino Quino checkerspot butterfly	Fed: CA:	**END** none	Occurs in chaparral and coastal sage scrublands, containing the proper host plants (i.e. dwarf plantain, white snapdragon, woolly plantain, and Chinese houses) and abundant nectar resources.	**Presumed Absent.** Numerous historic occurrences were documented in CNDDB however, none are within 5 miles of the Project Area. The Project Area is located out of the known range and survey area for this species.

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	Fed: CA:	**END** none	Occur in Delhi Sands series soils. Indicator plant species include telegraph weed (*Heterotheca grandiflora*), California buckwheat (*Eriogonum fasciculatum*), and California croton (*Croton californica*).	**Low Potential.** The Delhi Sands series is present throughout the Project Area; however, many of these areas are currently active agriculture operations or highly disturbed. The activities associated with these operations and other anthropogenic factors likely reduce the potential for this species to occur. Numerous recent and historic occurrences were documented in CNDDB however, only six are within 5 miles of the Project Area. All six occurrences were documented in the Project Area with the most recent occurrences documented in 2001 (OCC 5 and 15) and the oldest occurrences documented in 1941 (OCC 9).
Crustaceans				
Branchinecta sandiegonensis San Diego fairy shrimp	Fed: CA:	**END** none	Occurs in chaparral, coastal scrub, vernal pools, and wetlands and is endemic to San Diego and Orange County mesas. They occur in vernal pools found om top of the mesas.	**Presumed Absent.** This species is not known to occur in San Bernardino County and no suitable habitat was documented within the Project Area. One recent occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Fish				
Catostomus santaanae Santa Ana sucker	Fed: CA:	**THR** none	Occurs in clean, shallow portions of rivers and streams. They occur in water systems that experience a range of currents from swift to sluggish.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only two are within 5 miles of the Project Area. OCC 30 was documented in 2002 approximately 4 miles south of the Project Area. OCC 22 was documented in 2001 approximately 4 miles southeast of the Project Area.
Gila orcuttii arroyo chub	Fed: CA:	none SSC	Occurs primarily in the warm streams and rivers of the Los Angeles plain.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous historic and one recent occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Rhinichthys osculus ssp. 8 Santa Ana speckled dace	Fed: CA:	none SSC	Occur in a variety of aquatic habitats including small springs, streams, large rivers, and deep lakes. They are found in waters that are clear, well oxygenated, and with currents or waves. Vegetative cover allows for protection against predation.	**Presumed Absent.** No suitable habitat is present within the Project Area. Three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Amphibians				
Anaxyrus californicus arroyo toad	Fed: CA:	**END** SSC	Occur in desert washes, riparian scrub, riparian woodland, south coast flowing waters, and south coast standing waters. Require sandy stream sides with stable terraces for burrowing and scattered vegetation for shelter. Typically found within wide, terraced riparian floodplains, rather than in narrow, rocky channels with "plunge" pools. Sandy river washes are an integral component of their habitat and they typically prefer an open, rather than closed, riparian canopy.	**Presumed Absent.** No suitable habitat is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Rana boylii pop. 6 foothill yellow-legged frog south coast DPS	Fed: CA:	**END** **END**	Occur in aquatic habitats, riparian forest, riparian scrub, riparian woodland, and south coast flowing waters. Found in rock perennial streams with open sunny banks.	**Presumed Absent.** No suitable habitat is present within the Project Area. The Project Area is outside the known range for this species. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Rana muscosa southern mountain yellow-legged frog	Fed: CA:	**END** **END**	Occur in glaciated, alpine lakes, ponds, springs, and streams. Lakes usually have grassy or muddy margins.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Spea hammondii western spadefoot	Fed: CA:	none SSC	Typically occurs in scrub, chaparral, vernal pools, and rivers with sandy banks, willows, cottonwoods, and sycamores with loose, gravelly areas of streams in drier parts of range.	**Presumed Absent.** Although marginally suitable habitat for breeding is present in the form of detention basins that had water at the time of the biological reconnaissance survey or have the potential to fill with water, little to no suitable upland habitat is present to allow for dispersal or aestivation of adults. Additionally, activities associated with the active dairy operation likely reduce the potential for this species to occur. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Taricha torosa Coast Range newt	Fed: CA:	none SSC	Occur in oak woodlands, chaparral, and open grasslands. Breed in seasonal or permanent streams and deposit eggs to undersides of rocks.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two historic occurrences were documented in CNDDB however, neither were within 5 miles of the Project Area.
Reptiles				
Anniella stebbinsi Southern California legless lizard	Fed: CA:	none SSC	Typically occurs in moist warm loose soil with plant cover in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks.	**Presumed Absent.** No suitable soils or habitat are present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only two were within 5 miles of the Project Area. OCC 11 was documented in 1993 approximately 0.5 mile north of the Project Area. OCC 135 was documented in 1938 approximately 3 miles north of the Project Area.
Arizona elegans occidentalis California glossy snake	Fed: CA:	none SSC	Typically occurs in rocky washes, chaparral, scrub and grassland habitat, often with loose or sandy soils.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 220 was documented in 1946 approximately 3 miles east of the Project Area.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Aspidoscelis tigris stejnegeri coastal whiptail	Fed: CA:	none SSC	Found in a variety of habitats. They prefer hot, dry open areas that have little cover. Common habitats include chaparral, woodland, and riparian.	**Low Potential.** Marginally suitable habitat is present within the Project Area in areas disturbed and with low growing or little ground cover. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Coleonyx variegatus abbotti San Diego banded gecko	Fed: CA:	none SSC	Occur within rocky areas in coastal sage scrub and chaparral habitats.	**Presumed Absent.** No suitable habitat is present within the Project Area. One recent occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Crotalus ruber red-diamond rattlesnake	Fed: CA:	none SSC	Occur in arid scrub, coastal chaparral, oak and pine woodlands, rocky grasslands, and cultivated areas. Within desert slopes on mountains, often found within rocky desert flats.	**Presumed Absent.** No suitable habitat is present within the Project Area. The Project Area is outside the known range of the species. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Emys marmorata western pond turtle	Fed: CA:	none SSC	Occurs in aquatic, artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, south coast flowing waters, south coast standing waters, and wetland habitats. Needs basking sites (logs, rocks, and exposed banks) and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**Presumed Absent.** No suitable habitat is present within the Project Area. Three historic and one recent occurrence were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 1351 was documented in 2011 approximately 3 miles southeast of the Project Area.

***Scientific Name* Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Phrynosoma blainvillii coast horned lizard	Fed: CA:	none SSC	Occurs in chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinon & juniper woodlands, riparian scrub, riparian woodland, and valley & foothill grassland habitats. Requires open areas for sunning, bushes to provide cover, and loose soil for burial. Diet consists mainly of ants and also small invertebrates. Most commonly found in lowlands along sandy washes with scattered low bushes.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 437 was documented in 1998 approximately 2 miles northeast of the Project Area.
Salvadora hexalepis virgultea coast patch-nosed snake	Fed: CA:	none SSC	Occurs in coastal scrub in brushy or shrubby vegetation in coastal southern California. They require small mammal burrows to be present for refuge and overwintering sites.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two historic occurrences were documented in CNDDB however, neither were within 5 miles of the Project Area.
Thamnophis hammondii two-striped gartersnake	Fed: CA:	none SSC	Typically occurs near permanent or semi-permanent water sources in a variety of habitats.	**Presumed Absent.** No suitable habitat is present within the Project Area. One recent and two historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Birds				
Agelaius tricolor tricolored blackbird (nesting colony)	Fed: CA:	none **THR**/SSC	Occurs in freshwater marsh, swamp, and wetland habitats. Largely endemic to California. Highly colonial species, most numerous in Central Valley & vicinity. Requires open water, protected nesting substrate, and foraging area with insect prep within a few kilometers of the colony. Forages in open habitat such as cultivated fields and pastures.	**Low Potential.** Suitable habitat is present within the Project Area within corn fields and open water detention basins. However, the potential of occurrence is likely reduced due to active agriculture and farming operations. Numerous recent and historic occurrences were documented in CNDDB and all but two were documented within 5 miles of the Project Area. Three occurrences were documented approximately 2 miles from the Project Area in 1993 (OCC 993), 2014 (OCC 771), and 2014 (OCC 772). OCC 771 and 772 were also the most recent occurrences.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Ammodramus savannarum grasshopper sparrow	Fed: CA:	none SSC	Occur in valley and foothill grassland.	**Presumed Absent.** No suitable habitat is present within the Project Area. The Project Area is outside the known range of this species. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Aquila chrysaetos golden eagle (nesting & wintering)	Fed: CA:	none FP	Occurs in broadleaved upland forest, cismontane woodland, coastal prairie, Great Basin grassland, Great Basin scrub, lower montane coniferous forest, pinon & juniper woodlands, upper montane coniferous forest, and valley & foothill grassland habitats. Found in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also large trees such as eucalyptus or oak in open areas.	**Presumed Absent.** No nesting habitat is present on or adjacent to the Project Area. While individuals for this species could flyover the site, this species is not known to occupy urban habitats and the site does not provide suitable nesting habitat or valuable foraging habitat for this species. Two historic and one recent occurrence were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 125 was documented in 2007 approximately 1 mile west of the Project Area.
Asio otus long-eared owl	Fed: CA:	none SSC	Occur in cismontane woodland, great basin scrub, riparian forest, riparian woodland, and upper montane coniferous forest. Forage in open landcover and nest in dense wooded areas.	**Presumed Absent.** No suitable habitat is present within the Project Area. Three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Athene cunicularia burrowing owl (burrow & some wintering sites)	Fed: CA:	none SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Occurs in coastal prairie, coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, and valley & foothill grassland habitats. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel. Also found in vacant lots and airports.	**Present.** This species was observed during the biological reconnaissance survey. Suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB with 38 being within 5 miles of the Project Area and one being within the Project Area (OCC 1199 in 2011). OCC 1199 described numerous observations of burrowing owls beginning in 1992; these included numerous pairs of breeding adults and the presence of juveniles. In 2011, 8 nests, 13 active burrows, and 38 detections were documented.

***Scientific Name* Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Buteo swainsoni Swainson's hawk (nesting)	Fed: CA:	none **THR**	Occurs in Great Basin grassland, riparian forest, riparian woodland, and valley & foothill grassland habitats. Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Nests in solitary bush or tree, or in small groves. Requires adjacent suitable foraging areas such as grasslands or alfalfa/grain fields supporting rodent populations.	**Low Potential.** Marginally suitable habitat is present within the Project Area in the form of tall eucalyptus trees. The southernmost extent of the nesting range for this species is in the high desert. Three historic occurrences were documented in CNDDB; two of these were documented approximately 3 miles from the Project Area (OCC 2549 in 1919 and OCC 2548 in 1920). Due to the limited habitat and known range of this species, there is low potential for this species to occur in the Project Area.
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	Fed: CA:	none SSC	Occurs in coastal scrub. Require healthy stands of cactus for nesting.	**Presumed Absent.** No suitable habitat is present within the Project Area. Three historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Coccyzus americanus occidentalis western yellow-billed cuckoo (nesting)	Fed: CA:	**THR** **END**	Occurs in riparian forest habitat. Nests along the broad (≥ 12.4 acres) patches of multi-layered riparian woodland, often dominated by willows and cottonwoods of lower flood bottoms of larger river systems.	**Presumed Absent.** No suitable habitat is present within the Project Area. Six historic occurrences were documented in CNDDB; four were within 5 miles of the Project Area. The nearest occurrence (OCC 215) was documented in 1986 approximately 3 miles south of the Project Area. The most recent occurrence was in 2001 (OCC 36) approximately 4 miles south of the Project Area.
Coturnicops noveboracensis yellow rail	Fed: CA:	none SSC	Occur in freshwater marshes and meadows. Often nest is areas with shallow water and short vegetation.	**Presumed Absent.** No suitable habitat is present within the Project Area. One historic occurrence was documented in CNDDB. OCC 17 was documented in 1914 approximately 3 miles south of the Project Area.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Cypseloides niger black swift	Fed: CA:	none SSC	Coastal belt of Santa Cruz and Monterey counties; central & southern Sierra Nevada; San Bernardino & San Jacinto mountains. Often breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	**Presumed Absent.** No suitable habitat is present within the Project Area. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Elanus leucurus white-tailed kite	Fed: CA:	none FP	Occur in savannas, open woodlands, marshes, desert grasslands, cultivated fields, and other partially cleared areas. They will avoid areas that are too heavily grazed.	**Low Potential.** Suitable habitat is present within the Project Area in the presence of tall trees and open agricultural fields; however, potential for occurrence is decreased due to the presence of heavily disturbed (grazed) areas. Five recent occurrences were documented in CNDDB; two were within 5 miles of the Project Area. OCC 139 and 140 were documented in 2009 approximately 4 miles southwest of the Project Area.
Empidonax traillii extimus southwestern willow flycatcher (nesting)	Fed: CA:	**END** **END**	Occurs in riparian woodland habitat in Southern California. Nests in densest areas of riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes and reservoirs. Nests are often in nonnative tamarisk (*Tamarisk* spp.) and native willow (*Salix* spp.), typically in vegetation stands of 4-7 m in height.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two historic and one recent occurrence were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 34 was documented in 1991 approximately 5 miles south of the Project Area.
Haliaeetus leucocephalus bald eagle	Fed: CA:	none **END**/FP	Occurs in lower montane coniferous forests and old-growth. They can be found around ocean shores, lake margins, and rivers due to nesting habitat and most nests are found within 1 mile of water. Their nests are found in large, old-growth, or dominant live tree with open branches, especially in ponderosa pines and roost communally in winter.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous historic and one recent occurrence were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Icteria virens yellow-breasted chat	Fed: CA:	none SSC	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Nests in low, dense riparian, consisting of willow, blackberry, wild grape along streams or at the edges of ponds or swamps. Forages and nests within 10 ft of ground.	**Presumed Absent.** No suitable habitat is present within the Project Area. One recent and three historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 30 was documented in 2000 approximately 3 miles southeast of the Project Area.
Laterallus jamaicensis coturniculus California black rail	Fed: CA:	none **THR/**FP	Occurs in marshes, wet meadows, riparian marshes, coastal prairies, salt marshes, and impounded wetlands. Water levels are usually shallow, less than 2 inches deep. American glasswort (Salicornia *sp.*), bulrush species (*Typha angustifolia*), and alkali seaheath (*Frankenia salina*) are common plant species.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 63 was documented in 1931 within the Project Area.
Polioptila californica californica coastal California gnatcatcher	Fed: CA:	**THR** SSC	Occurs in coastal sage scrub, desert scrub, and coastal dune scrub.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only 4 were within 5 miles of the Project Area. OCC's 955 (in 2018), 1060 (in 1060), 1059 (in 2018), and 1061 (in 2019) were documented within approximately 5 miles of the Project Area.
Setophaga petechia yellow warbler (nesting)	Fed: CA:	none SSC	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. Diet consists primarily of insects.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two recent occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 75 was documented in 2016 approximately 4 miles southeast of the Project Area.

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Vireo bellii pusillus least Bell's vireo (nesting)	Fed: CA:	**END** **END**	Occurs in riparian forest, riparian scrub, and riparian woodland habitats. Summer resident of Southern California in low riparian vegetation in the vicinity of water or in dry river bottoms, below 2,000 ft msl. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, mule fat, and mesquite.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only 7 were within 5 miles of the Project Area. The nearest occurrences were documented approximately 3 miles from the Project Area in 2010 (OCC 144 and 364) and 2013 (OCC 58). OCC 58 was the nearest and most recent occurrence.
Mammals				
Antrozous pallidus pallid bat	Fed: CA:	none SSC	Occurs in chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, and valley & foothill grassland habitats. Most commonly found in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Frequently roost in live trees and snags that have holes and cavities or crevices formed by exfoliating bark. Roosts have been documented in a variety of structures including human-created structures such as bridges, barns, and buildings. Very sensitive to disturbance of roosting sites.	**Low Potential.** Marginally suitable roosting habitat is present within the Project Area in the form of abandoned buildings. Two historic occurrences were documented in CNDDB; one was within 5 miles of the Project Area. OCC 243 was documented in 1951 approximately 3 miles northwest of the Project Area. Although suitable habitat is present, the potential for this species to occur is greatly reduced in urban areas.
Dipodomys merriami parvus San Bernardino kangaroo rat	Fed: CA:	**END** CAN**,** SSC	Occur on the gentle slopes of alluvial fans, flood plains, washes, and adjacent habitats. Common habitats include alluvial sage scrub, coastal sage scrub, and chaparral.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 52 was documented in 1994 approximately 4 miles northeast of the Project Area.

Scientific Name **Common Name**	**Status**		**Habitat Requirements**	**Potential for Occurrence**
Dipodomys stephensi Stephens' kangaroo rat	Fed: CA:	**THR** **THR**	Occur in arid and semi-arid habitats. Prefer open areas where the cover is less than 50%.	**Presumed Absent.** No suitable habitat is present within the Project Area. The Project Area is outside the known range for this species (i.e., western Riverside County, and San Diego County). Numerous recent and historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 252 was documented in 2013 approximately 4 miles east of the Project Area.
Eumops perotis californicus western mastiff bat	Fed: CA:	none SSC	Occurs in open areas that have potential roosting areas. Primarily roosts in cliffs and rock crevices. Found in semi-arid to arid habitats.	**Low Potential.** The abandoned buildings in the Project area are only marginally suitable as roosting habitat for this species due to their height. Numerous historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 31 was documented in 1993 approximately 5 miles southeast of the Project Area.
Lasiurus xanthinus western yellow bat	Fed: CA:	none SSC	Occurs within riparian woodland habitats, open grassland habitats, and in canyons. As a tree roosting species, they are often associated with cottonwoods (*Populus sp.*) in riparian habitats but are known to commonly roost between the fronds of an intact fronds skirt of palm trees.	**Moderate Potential.** Suitable roosting habitat is present in the form of palm trees (with intact thatch) and other tree species (e.g., eucalyptus with dense foliage). Numerous historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 23 was documented in 1981 approximately 4 miles southeast of the Project Area.
Neotoma lepida intermedia San Diego desert woodrat	Fed: CA:	none SSC	Occur in a variety of habitats such as desert scrub. They are known to prefer rock outcroppings and cactus patches.	**Presumed Absent.** No suitable habitat is present within the Project Area. Numerous recent and historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.

Scientific Name Common Name	Status		Habitat Requirements	Potential for Occurrence
Nyctinomops femorosaccus pocketed free-tailed bat	Fed: CA:	none SSC	Occurs in pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis habitat. Primarily roosts in cliffs and rock crevices. This species is a colonial roosting bat that is also known to roost in buildings and caves. This species is not known to roost in bridges.	**Low Potential.** Marginally suitable roosting habitat is present in the form of abandoned buildings. Four historic occurrences were documented in CNDDB however, none were within 5 miles of the Project Area.
Nyctinomops macrotis big free-tailed bat	Fed: CA:	none SSC	Occur in rocky arid landscapes including desert shrub, woodlands, and evergreen forests. Primarily roosts on rocky cliffs, but also in caves, buildings, and tree cavities.	**Low Potential.** Marginally suitable roosting habitat is present in the form of abandoned buildings and tree species. One historic occurrence was documented in CNDDB however, it was not within 5 miles of the Project Area.
Ovis canadensis nelsoni desert bighorn sheep	Fed: CA:	none FP	Occurs in alpine, alpine dwarf scrub, chaparral, chenopod scrub, great basin scrub, mojavean desert scrub, montane dwarf scrub, pinon & juniper woodlands, riparian woodland, and Sonoran desert scrub. Prefer steep rocky terrain and require freestanding water.	**Presumed Absent.** No suitable habitat is present within the Project Area. Two historic occurrences were documented in CNDDB however, neither were within 5 miles of the Project Area.
Perognathus longimembris brevinasus Los Angeles pocket mouse	Fed: CA:	none SSC	Occurs in low elevational grassland, alluvial sage scrub, and coastal sage scrub.	**Low Potential.** Marginally suitable habitat is present within the Project Area in the form of disturbed grassy areas with friable soils. One recent and numerous historic occurrences were documented in CNDDB however, only one was within 5 miles of the Project Area. OCC 36 was documented in 2001 approximately 5 miles northeast of the Project Area.

Federal Designations:
(Federal Endangered Species Act, U.S. Fish and Wildlife Service)
END: Federally-listed, Endangered
THR: Federally-listed, Threatened
FC: Federal Candidate Species
DL: Federally-delisted

State Designations:
(California Endangered Species Act, CDFW)
END: State-listed, Endangered
THR: State-listed, Threatened
CAN: Candidate for state listing
SSC: Species of Special Concern
FP: Fully Protected Species

Source: California Natural Diversity Data Base (CNDDB) California Native Plant Society Electronic Inventory (CNPSEI) Guasti, Corona North, Corona South, Mt. Baldy, Cucamonga Peak, Devore, Fontana, Riverside West, Lake Mathews, Black Star Canyon, and Prado Dam 7.5-minute quads.

Appendix E2 Aquatic Resources Delineation

Appendices

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Aquatic Resources Delineation
for the
Ontario Regional Sports Complex Project

City of Ontario

San Bernardino County, California

Prepared For:

Placeworks, Inc.

Prepared By:

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DRAFT

December 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Definition**
˚F	degrees Fahrenheit
Agencies	U.S. Environmental Protection Agency and Department of the Army
APT	Antecedent Precipitation Tool
CDFW	California Department of Fish and Wildlife
CWA	Clean Water Act
FR	Federal Register
HUC	Hydrologic Unit Code
LSA	Lake or Streambed Alteration
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
Project	Central Business Center Project
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
Study Area	Footprint of APNs 0463-201-44 and 0463-201-43
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

On behalf of Placeworks, Inc., ECORP Consulting, Inc. (ECORP), conducted an aquatic resources delineation for a portion of the Ontario Regional Sports Complex Project (Project) located in the City of Ontario, San Bernardino County, California. The approximately 0.46-acre Study Area is located at Assessor's Parcel Numbers 0216-31-409 and 0218-18-101 and also within the Public Right-of-Way (ROW) between these two parcels. The Study Area is located south of Schaefer Avenue, north of Edison Avenue, east of Walker Avenue, and west of South Archibald Avenue (Figure 1). This corresponds to unsectioned Santa Ana Del Chino Land Grant, U.S. Geological Service (USGS) 7.5-minute Corona North quadrangle (San Bernardino Base and Meridian; Figure 2). The approximate center of the Study Area is located at 33.998081° North and 117.610721° West. The Study Area is located within the Santa Ana watershed (Hydrologic Unit Code [HUC]-8 #18070203) and within the Lower Cucamonga Creek subwatershed (HUC-12 #180702030705; Natural Resources Conservation Service [NRCS], et al. 2023). Driving directions to the Study Area are included in Appendix A.

This report provides a summary of aquatic resources, if present, within the Study Area that may be regulated pursuant to the Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act, or Section 1600 et al. of the California Fish and Game Code. The Study Area for the purpose of this report includes portions of two APNs 0216-31-409 and 0218-18-101 as well as land within the Public ROW between these two APNs.

2.0 REGULATORY REQUIREMENTS

2.1 Waters of the United States

This report describes aquatic resources, including wetlands, that may be regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 and/or the Regional Water Quality Control Board (RWQCB) under Section 401 of the federal CWA. The following sections define these regulations.

2.1.1 Wetlands

Wetlands are "*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*" [51 Federal Register (FR) 41250, Nov. 13, 1986, as amended at 58 FR 45036, Aug. 25, 1993]. Wetlands can be perennial or intermittent.

2.1.2 Other Waters

Other waters are nontidal, perennial, and intermittent watercourses and tributaries to such watercourses [51 FR 41250, Nov. 13, 1986, as amended at 58 FR 45036, August 25, 1993]. The limit of USACE jurisdiction for nontidal watercourses (without adjacent wetlands) is defined in 33 Code of Federal Regulations 328.4(c)(1) as the "ordinary high water mark" (OHWM). The OHWM is defined as the "line on the shore

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Map Date: 11/10/2023

Sources: Maxar (2023)

Figure 1. Project Location and Vicinity

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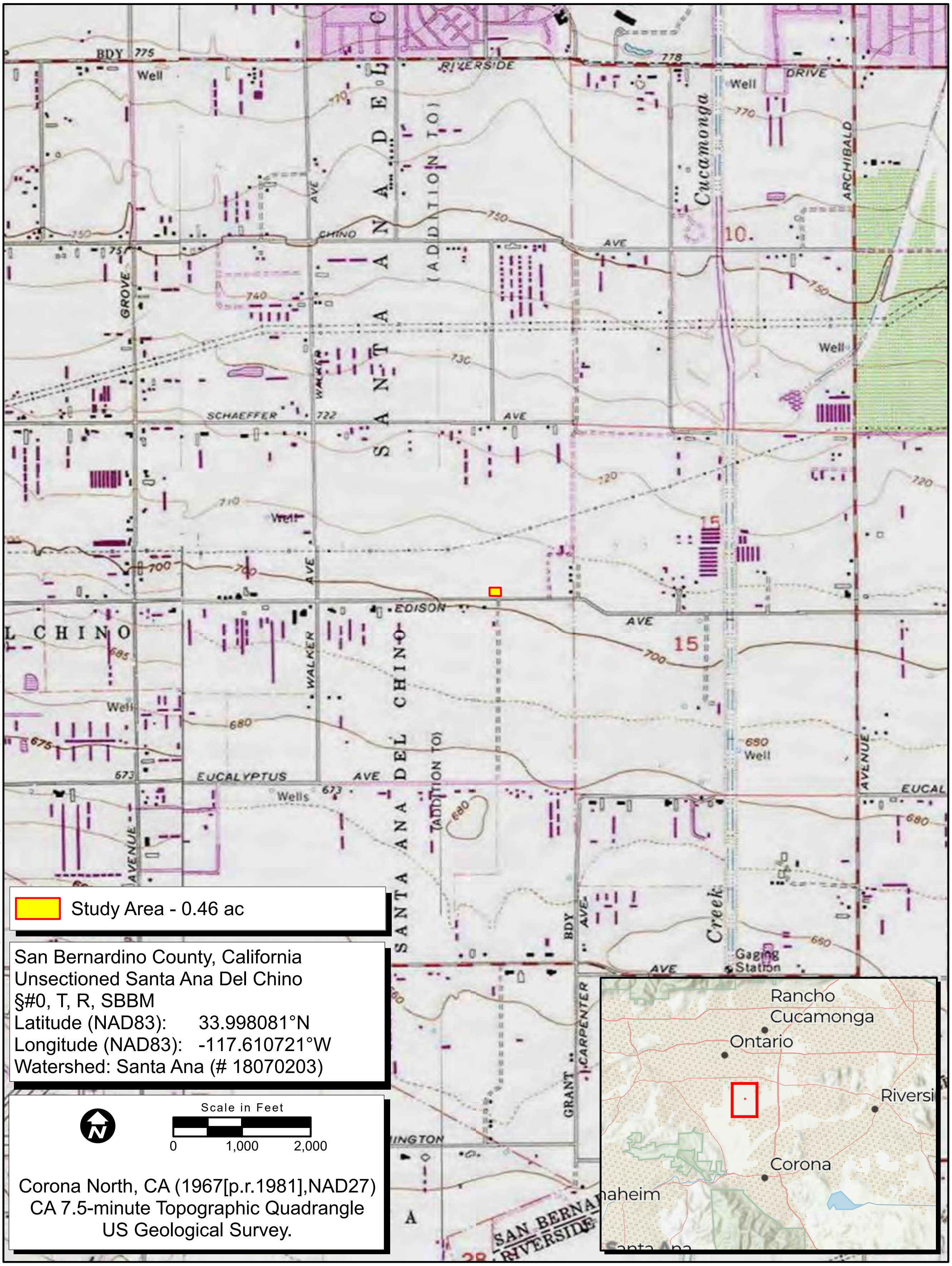

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Map Date: 11/10/2023
Sources: ESRI, USGS

Figure 2. USGS Topographic Quadrangle

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established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" approximation of the lateral limit of USACE jurisdiction. The upstream limits of other waters are defined as the point where the OHWM is no longer perceptible.

2.2 Clean Water Act

The USACE regulates discharge of dredged or fill material into Waters of the U.S. under Section 404 of the CWA. Waters of the U.S. include surface waters such as navigable waters and their tributaries, all interstate waters and their tributaries, natural lakes, all wetlands adjacent to other waters, and all impoundments of these waters; a full definition is provided later in this report. *Discharges of fill material* is defined as the addition of fill material into Waters of the U.S., including, but not limited to, the following: placement of fill necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes, and subaqueous utility lines [33 Code of Federal Regulations Section 328.2(f)]. In addition, Section 401 of the CWA (33 U.S. Code 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into Waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Substantial impacts to wetlands, over 0.5 acre of impact, may require an individual permit. Projects that only minimally affect wetlands, less than 0.5 acre of impact, may meet the conditions of one of the existing Nationwide Permits. A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions; this certification or waiver is issued by the RWQCB.

2.3 Jurisdictional Assessment

On December 22, 2022, the U.S. Environmental Protection Agency and Department of the Army (Agencies) announced a final rule defining Waters of the United States. The definition was founded upon the pre-2015 *Rapanos* decision, updated to reflect consideration of Supreme Court decisions, the science, and the Agencies' technical expertise. The final rule was published in the Federal Register on January 18, 2023 and effective as of March 20, 2023.

On May 25, 2023, the Supreme Court of the United States adopted a narrower definition of Waters of the United States in the case Sackett v. Environmental Protection Agency. Under the majority opinion, Waters of the United States refers to "geographical features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes' and to adjacent wetlands that are 'indistinguishable' from those bodies of water due to a continuous surface connection."

On August 29, 2023, the U.S. Environmental Protection Agency and the Department of the Army (Agencies) issued a final rule to amend the final "*Revised Definition of 'Waters of the United States'*" rule, published in the FR on January 18, 2023. This final rule conforms the definition of "waters of the United States" to the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency*. Parts of the January 2023 Rule are invalid under the Supreme Court's interpretation of the CWA in the Sackett decision. Therefore, the Agencies have amended key aspects of the regulatory text to conform to the Court's decision.

The conforming rule became effective upon publication in the FR on September 9, 2023. Where the January 2023 Rule is not enjoined, the agencies will implement the January 2023 Rule, as amended by the conforming rule.

In summary, under the conforming rule, the term waters of the United States will mean:

- Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- The territorial seas;
- Interstate waters;
- Impoundments of waters otherwise defined as waters of the United States under this definition;
- Tributaries of a) Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, b) the territorial seas, and c) interstate waters;
- Wetlands adjacent to a) Waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, b) the territorial seas, and c) interstate waters: or
- Wetlands adjacent (defined as having a continuous surface connection) to relatively permanent, standing or continuously flowing bodies of water identified as impoundments of waters and with a continuous surface connection to those waters.
- Intrastate lakes and ponds that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the water previously identified.

Waters excluded from this definition include prior converted cropland (defined by the U.S. Department of the Agriculture), waste treatment systems, ditches (including roadside ditches) excavated wholly in and draining only dry land, artificially irrigated areas that would revert to dry land if the irrigation ceased, artificial lakes or ponds, artificial reflecting pools or swimming pools, waterfilled depressions (e.g., created in dry land incidental to construction activity, pits excavated in dry land for purposes of obtaining fill, sand, or gravel), swales and erosional features (e.g., gullies, small washes) that are characterized by low volume, infrequent, or short duration flow.

2.4 Porter-Cologne Water Quality Control Act

The RWQCB implements water quality regulations under the federal CWA and the Porter-Cologne Water Quality Act. These regulations require compliance with the National Pollutant Discharge Elimination System (NPDES), including compliance with the California Storm Water NPDES General Construction Permit for discharges of storm water runoff associated with construction activities. General Construction

Permits for projects that disturb 1.0 or more acres of land require development and implementation of a Storm Water Pollution Prevention Plan. Under the Porter-Cologne Water Quality Act, the RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the water of the state" (Water Code 13260(a)). Waters of the State are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (Water Code 13050 (e)). The RWQCB regulates all such activities, as well as dredging, filling, or discharging materials into Waters of the State, that are not regulated by the USACE due to a lack of connectivity with a navigable water body. The RWQCB may require issuance of a Waste Discharge Requirements for these activities).

2.5 California Fish and Game Code Section 1602

Pursuant to Section 1602 of the California Fish and Game Code, a Notification of Lake or Streambed Alteration (LSA) form must be submitted for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake" (California Department of Fish and Wildlife [CDFW] 2023). In Title 14 of the California Code of Regulations, Section 1.72, the CDFW defines a *stream* (including creeks and rivers) as:

> "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."

The CDFW publishes no formal methodology for determination of the extent of their jurisdiction. The definition of streambed as:

> "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a "surface or subsurface flow that supports riparian vegetation" (Title 14, Section 1.72).

For the purposes of this report, based on experience with the agency, the CDFW's jurisdiction includes drainages with a definable bed, bank, or channel with the jurisdictional limit being the top of bank (TOB). It also includes areas that support intermittent, perennial, or subsurface flows; supports fish or other aquatic life; or supports riparian or hydrophytic vegetation. It also includes areas that have a hydrologic source. Riparian vegetation associated with lakes or streambeds is also considered to be subject to CDFW's jurisdiction.

The CDFW will determine if the proposed actions will result in diversion, obstruction, or change of the natural flow, bed, channel, or bank of any river, stream, or lake that supports fish or wildlife. The CDFW will submit a draft Streambed Alteration Agreement (SAA) that includes measures to protect affected fish and wildlife resources. Through a process of review, comment, and modification between the CDFW and the applicant, the SAA becomes final when signed by both parties.

3.0 METHODS

3.1 Field Survey Investigation

This aquatic resources delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Arid West Region Supplement; USACE 2008). Non-wetland waters were identified in the field according to *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008) and the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010), where applicable. The boundaries of aquatic resources were delineated through standard field methods (e.g., paired sample set analyses). Field data were recorded on Wetland Determination Data Forms – Arid West Region (Appendix B). A color aerial photograph available on Google Earth© was used to assist with mapping and ground-truthing. *Munsell Soil Color Charts* (Munsell Color 2009) and the Web Soil Survey (NRCS 2023a) were used to aid in identifying hydric soils in the field. *The Jepson Manual: Vascular Plants of California* (Baldwin et al. 2012) was used for plant nomenclature and identification.

The field survey was conducted on November 13, 2023 by ECORP biologists Chelsie Brown and Alexandra Dorough. The biologists walked the entire approximately 0.46-acre Study Area to determine the location and extent of aquatic resources within the Study Area. No aquatic resources were found onsite, so no paired sample locations were surveyed. Non-paired locations were sampled to document representative upland areas that lacked hydrophytic vegetation, hydric soils, and/or wetland hydrology. Sampling locations were recorded in the field using a post-processing capable Global Positioning System unit with sub-meter accuracy (e.g., tablet or phone with ArcGIS™ Field Maps using Juniper Geode™ submeter).

A typical year analysis of the Study Area was conducted via a single-point method using the USACE Antecedent Precipitation Tool (APT; USACE 2023). The APT is an automation tool that utilizes standardized methodology to calculate precipitation normalcy at a given location using publicly available data sources. The APT analysis determines whether precipitation, drought, and other climatic conditions from the previous three months are wet, normal, or dry for the geographic area based on a rolling 30-year period (USACE 2023).

3.2 Routine Determinations for Wetlands

The following three criteria must be met to be determined a wetland:

- A majority of dominant vegetation species are wetland-associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season; and
- Hydric soils are present.

3.2.1 Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase *a prevalence of vegetation typically adapted for life in saturated soil conditions*. Prevalent vegetation is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The dominance test is the basic hydrophytic vegetation indicator and was applied at each sampling point location. The *50/20 rule* was used to select the dominant plant species from each stratum of the community. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of coverage and cumulatively totaled) that immediately exceed 50 percent of the total coverage for the stratum, plus any additional species that individually comprise 20 percent or more of the total cover in the stratum (USACE 1992, 2008).

Dominant plant species observed at each sampling point were then classified according to the indicator status (probability of occurrence in wetlands; Table 1) in the National Wetland Plant List (USACE 2020). If the majority (more than 50 percent) of the dominant vegetation on a site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), the site was considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species[1]

Plant Species Classification	Abbreviation	Probability of Occurring in Wetland
Obligate	OBL	Almost always occur in wetlands
Facultative Wetland	FACW	Usually occur in wetlands, but may occur in non-wetlands
Facultative	FAC	Occur in wetlands and non-wetlands
Facultative Upland	FACU	Usually occur in non-wetlands, but may occur in wetlands
Upland	UPL	Almost never occur in wetlands
Plants That Are Not Listed (assumed upland species)	N/L	Does not occur in wetlands in any region.

[1]Source: U.S. Army Corps of Engineers (USACE) 2012

In instances where indicators of hydric soil and wetland hydrology were detected but the plant community failed the dominance test, the vegetation was reevaluated using the Prevalence Index. The Prevalence Index is a weighted-average wetland indicator status of all plant species in the sampling plot, where each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and weighting is by abundance (percent cover). If the plant community failed the Prevalence Index, the presence/absence of plant morphological adaptations to prolonged inundation or saturation in the root zone was evaluated.

3.2.2 Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2003). Indicators that a hydric soil is present include, but are not limited to, histosols, histic epipedon, hydrogen sulfide, depleted below dark surface, sandy redox, loamy gleyed matrix, depleted matrix, redox dark surface, redox depressions, and vernal pools.

A soil pit was excavated at each sampling point to the depth needed to document an indicator, to confirm the absence of indicators, or until refusal at each sampling point. The soil was then examined for hydric soil indicators. Soil colors were determined while the soil was moist using the *Munsell Soil Color Charts* (Munsell Color 2009). Hydric soils are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment. These processes and the features in the soil that develop can be identified by looking at the color and texture of the soils.

3.2.3 Hydrology

Wetlands, by definition, are seasonally or perennially inundated or saturated at or near (within 12 inches of) the soil surface. Primary indicators of wetland hydrology include, but are not limited to, visual observation of saturated soils, visual observation of inundation, surface soil cracks, inundation visible on aerial imagery, water-stained leaves, oxidized rhizospheres along living roots, aquatic invertebrates, water marks (secondary indicator in riverine environments), drift lines (secondary indicator in riverine environments), and sediment deposits (secondary indicator in riverine environments). The occurrence of one primary indicator is sufficient to conclude that wetland hydrology is present. If no primary indicators are observed, two or more secondary indicators are required to conclude wetland hydrology is present. Secondary indicators include, but are not limited to, drainage patterns, crayfish burrows, FAC-neutral test, and shallow aquitard.

3.3 Post-Processing

The data collected in the field utilized ArcGIS™ Field Maps on a device (smartphone or tablet) connected to a submeter external receiver. The submeter receiver applies differential correction instantaneously in the field using the Satellite-Based Augmentation System. The data were then viewed and analyzed for verification, edited, and compiled in Geographic Information System format at the time of download. ArcGIS™ software was used to develop the geodatabase and the shapefiles depicted on the figures included in this report.

4.0 RESULTS

4.1 Existing Site Conditions

The Study Area is on relatively flat terrain situated at an elevational range of approximately 685 to 705 feet above mean sea level in the South Coast Subregion of the Southwestern region of the California Floristic Province (Baldwin et al. 2012). This area is characterized by an arid Mediterranean climate, which is comprised of hot and dry summer months and cooler winter months with precipitation recorded as combination of snow and rain. The average winter low temperature in the vicinity of the Study Area is 55.2 degrees Fahrenheit (˚F), and the average summer high temperature is 80.1˚F. Average annual precipitation is approximately 11.64 inches, which falls as rain (National Oceanic and Atmospheric Administration [NOAA] 2023a). During the 2022-2023 water year prior to the field survey (i.e., October 1, 2022 to September 30, 2023), 25.79 inches of precipitation were recorded at the Ontario International Airport, California reporting station (NOAA 2023b), located approximately 4 miles north of the Study Area.

The Study Area consists of disturbed land with ruderal plant species present including peregrine saltbush (*Atriplex suberecta*), lamb's quarters (*Chenopodium album*), and golden crownbeard (*Verbesina encelioides* ssp. *exauriculata*). A waste management basin is present within the Study Area and does not appear to be maintained currently; however, the waste management basin can be seen on aerial imagery as far back as 1994 and appears to have been maintained until 2020 or 2021 (Google Earth 2023). The waste management basin was constructed for an adjacent dairy farm operation under an Engineered Waste Management Plan for the RWQCB under a permit to operate. Aerial imagery shows that the adjacent dairy farm was converted to a nursery starting in 2020 or 2021.

The bottom of the waste management basin is partially vegetated and dominated by peregrine saltbush and lamb's quarters. Pieces of old furniture, uprooted vegetation, dirt fill, and trash are observed along the northern and western banks of the basin. One to two individuals of mulefat (*Baccharis salicifolia*) and two to three individuals of black willow (*Salix gooddingii*) are present along the southeastern banks of the waste management basin. Surrounding land uses are primarily active agriculture and disturbed land. Cropland occurs immediately west and east of the Study Area. A paved road, Edison Avenue, occurs immediately south of the Study Area. Irrigation pipes run along the eastern boundary of the Study Area. The Study Area likely receives runoff from the adjacent cropland to the west and east and from the adjacent irrigation pipes to the east.

A complete list of plant species observed within the Study Area is provided in Appendix B.

The aquatic resources delineation was conducted in the winter, outside the blooming season for most plant species. The survey was conducted at an acceptable time of the year to observe wetland hydrology, and although few wetland plant species were in bloom at the time of the survey, most plants were identifiable to species based upon vegetative or fruit morphology.

The APT was run for the Study Area for the date the field delineation data were collected, November 13, 2023. The APT demonstrated the site conditions on this date represents a time of year referenced as the dry season, that the general region and site's drought conditions were of moderate wetness, and that site conditions were normal in climatic conditions (USACE 2023).

A previous study was conducted for the site by Glenn Lukos Associates, Inc. in 2015 and found no aquatic resources in the rest of the Project Area (Glenn Lukos Associates, Inc. 2015a, 2015b).

4.1.1 Soils

According to the Web Soil Survey (NRCS 2023a), one soil unit, or type, has been mapped within the Study Area (Figure 3; Table 2; NRCS 2023a):

- Db - Delhi fine sand.

The Delhi series consists of very deep, somewhat excessively drained soils that formed in wind modified material weathered from granitic rock sources. Delhi soils are found on floodplains, alluvial fans, and terraces and have slopes of 0 to 15 percent (NRCS 2023b).

Table 2. Natural Resources Conservation Service Soil Types within the Study Area[1]

Map Unit Symbol	Map Unit Name	Hydric Rating[2]	Hydric Components[2]	Hydric Component Landform[2]
Db	Delhi fine sand	Yes	Unnamed	Depressions

[1]Source: NRCS 2023a
[2]Source: NRCS 2023c

4.1.2 National Wetlands Inventory

The U.S. Fish and Wildlife Service (USFWS) has established the National Wetlands Inventory (NWI) to conduct a nationwide inventory of U.S. wetlands to provide biologists and others with information on the distribution and type of wetlands to aid in conservation efforts (USFWS 2023). The USFWS's objective of mapping wetlands and deep-water habitats is to produce reconnaissance-level information on the location, type, and size of these resources. The maps are prepared from the analysis of high-altitude imagery. Wetlands are identified based on vegetation, visible hydrology, and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis. The NWI program was neither designed nor intended to produce legal or regulatory products; therefore, wetlands identified by the NWI program are not the same as wetlands defined by the USACE.

According to NWI, one aquatic freshwater pond classified as PUBHx, or *Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated*, has been previously mapped within the Study Area (Figure 4). This feature corresponds to the waste management basin assessed during the aquatic resources delineation. This waste management basin does not support wetland characteristics or OHWM indicators, based on field data collected on November 13, 2023.

4.2 AQUATIC RESOURCES

No aquatic resources were identified within the Study Area. Three sample points were collected in the waste management basin within the Study Area (Figure 5). None of the sample points passed the three-criteria necessary to be a wetland. Soils were significantly disturbed throughout the bottom of the waste management basin and included fill material as well as runoff of soils from adjacent cropland.

Map Contents

Study Area - 0.46 ac

Series Number - Series Name

Db,Delhi fine sand

Sources: Maxar., Esri World Imagery

Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Soils_and_Geology\Ontario_Soils_Geology.aprx - OPB Soils 20231110 (lgalvez - 11/10/2023)

Map Date: 11/10/2023

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 300

E2-15

Figure 3. Natural Resources Conservation Service Soil Types

2023-177 Ontario Ball Park

Map Contents

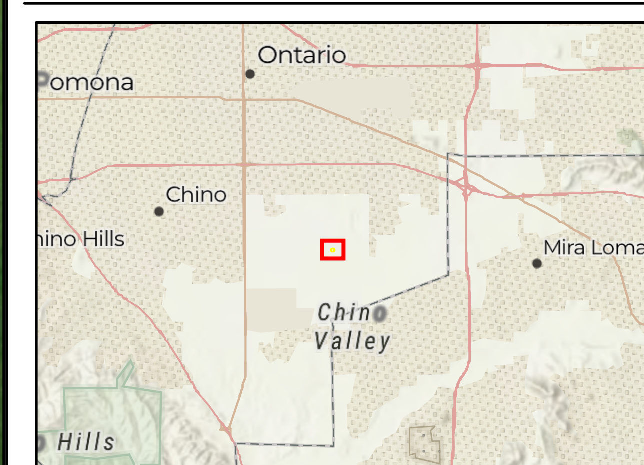
Study Area - 0.46 ac

NWI Type

Freshwater Emergent Wetland

Freshwater Pond

Sources: ESRI, Maxar (2023), NWI



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Aquatic_Resources\Ontario_Aquatic_Resources.aprx - OBP NWI 20231110 (lgalvez - 11/10/2023)

Map Date: 11/10/2023

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 300

E2-16

Figure 4. National Wetlands Inventory

2023-177 Ontario Ball Park

Map Contents

Study Area - 0.46 ac.

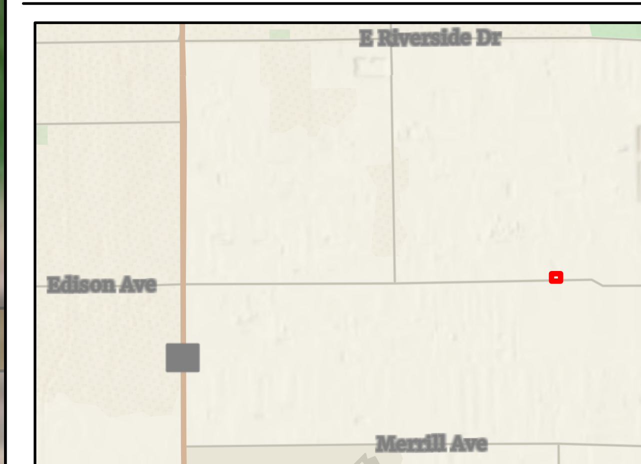
Reference Coordinates (NAD83)

Sample Points

Upland Sample Point

Photo Source: Esri Imagery, Maxar (2023)
Boundary Source: Placeworks
Delineator(s): Chelsie Brown
Coordinate System: NAD 1983 StatePlane California V FIPS 0405 Feet

[1] Subject to U.S. Army Corps of Engineers verification. This exhibit depicts information and data produced in accord with the wetland delineation methods described in the 1987 Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0 as well as the Updated Map and Drawing Standards for the South Pacific Division Regulatory Program as amended on February 10, 2016, and conforms to Sacramento District specifications. However, feature boundaries have not been legally surveyed and may be subject to minor adjustments if more accurate locations are required.
* The acreage value for each feature has been rounded to the nearest 1/100 decimal. Summation of these values may not equal the total potential Waters of the U.S. acreage reported.



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Aquatic_Resources\Ontario_Aquatic_Resources.aprx - Ontario Ball Park ARD 20231116 (kedwards - 11/16/2023)

Map Date: 11/16/2023

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Scale in Feet
0 25

E2-17

Figure 5. Aquatic Resources Delineation

2023-177 Ontario Ball Park

Sample Point 1: The dominant plants at Sample Point 1 included peregrine saltbush (FACU) and lamb's quarters (FACU) and did not pass the dominance test or prevalence index for hydrophytic vegetation. The soil matrix colors were 10YR 2/2, 2.5Y 4/2, and 5Y 4/2, at depths of zero to three inches, three to five inches, and five to 18 inches, respectively, with no redox features present. The soil at Sample Point 1 did not meet the hydric soil criteria. Wetland hydrology indicators observed at Sample Point 1 included saturation (A3), surface soil cracks (B6), inundation visible on aerial imagery (B7), and biotic crust (B12). Saturation was present at Sample Point 1 from the soil surface to a depth of 5 inches.

Sample Point 2: Two plant species were dominant at Sample Point 2, including peregrine saltbush (FACU) and lamb's quarters (FACU). The plants did not pass the dominance test or prevalence index for hydrophytic vegetation. The soil at Sample Point 2 did not meet the hydric soil criteria. Soil matrix colors included 7.5YR 2.5/2 at a depth of zero to two inches, with no redox features present, and the matrix was colored 5Y 5/2 at a depth of two to 19 inches, with no redox features present. Sample Point 2's wetland hydrology indicators included surface soil cracks (B6) and inundation visible on aerial imagery (B9).

Sample Point 3: One dominant plant species, peregrine saltbush (FACU), was present at Sample Point 3. Vegetation at Sample Point 3 did not pass the dominance test or prevalence index for hydrophytic vegetation. Soil matrix colors included 10YR ¾ at a depth of zero to eight inches and was colored 5Y 4/2 at a depth of eight to 18 inches with 2-percent redox concentrations in the matrix and pore lining colored 7.5YR 4/4. The soil at Sample Point 3 met the depleted matrix (F3) hydric soil indicator. However, the presence of hydric soils could be relict from when this area was extensively irrigated, and the basin was regularly maintained. Wetland hydrology indicators included surface soil cracks (B6) and inundation visible on aerial imagery (B7).

A list of plant species observed within the Study Area is included as Appendix B. The wetland determination data forms documenting upland conditions throughout the Study Area are included as Appendix C. Photo-documentation of the Study Area is included as Appendix D.

5.0 JURISDICTIONAL ASSESSMENT

The entire approximately 0.46-acre Study Area consists of upland habitat with a waste management basin present. There are no aquatic resources present within the Study Area.

There are no features present in the Study Area that meet the current definition of Waters of the U.S. to be regulated by USACE under Section 404 of the Clean Water Act. In addition, there are no resources present that would qualify as Section 401 resources jurisdictional to the RWQCB.

The waste management basin located within the Study Area is not considered a 1602 regulated feature by CDFW because this feature does not fall within the definition of "streams, rivers, or lakes," is not hydrologically connected with any stream, river, or lake, and would not contribute runoff to any such feature. Section 1602(a) of the Fish and Game Code outlines waters subject to a requirement that an LSA Notification be submitted to CDFW. This code applies when an entity:

- Substantially diverts or obstructs the natural flow of any river, stream or lake;

- Substantially changes or uses any material from the bed, channel, or bank of any river, stream or lake; or
- Deposits or disposes of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream or lake.

Therefore, the waste management basin is not expected to be subject to regulation under California Fish and Game Code Section 1602.

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LIST OF APPENDICES

APPENDIX A

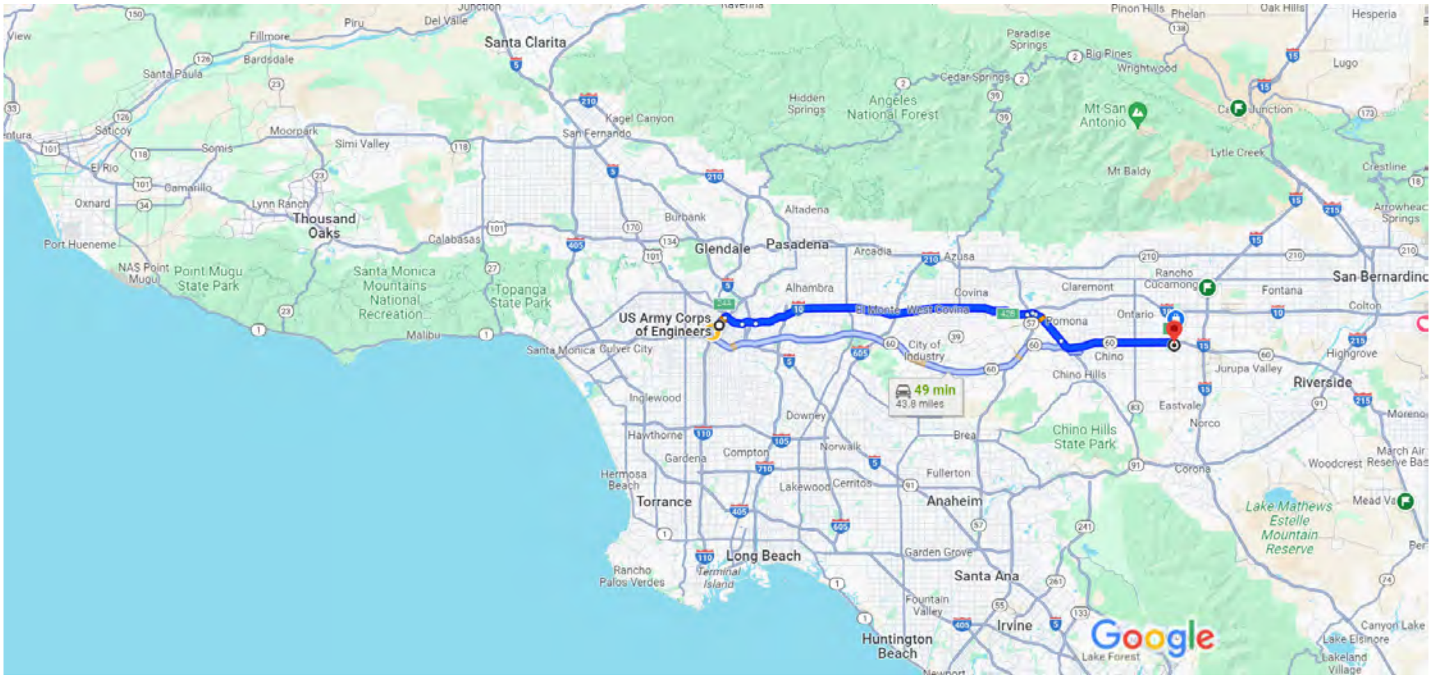
Driving Directions to Study Area

Google Maps

US Army Corps of Engineers, 915 Wilshire Blvd, Los Angeles, CA 90017 to Mountain View Elementary School District, Ontario, CA

Drive 41.2 miles, 46 min

Ontario Sports Complex Project Aquatic Resources Delineation Study Area



Map data ©2023 Google 5 mi

US Army Corps of Engineers
915 Wilshire Blvd, Los Angeles, CA 90017

Get on CA-110 N from S Figueroa St

2 min (0.5 mi)

1. Head southeast on Wilshire Blvd toward S Figueroa St

315 ft

2. Use the left 2 lanes to turn left at the 1st cross street onto S Figueroa St

0.2 mi

3. Use the 3rd from the left lane to turn left at the 3rd cross street onto W 5th St

125 ft

4. Take the Habor Fwy N/California 110 N ramp

0.2 mi

Take I-10 E and CA-60 E to S Archibald Ave in Ontario. Take exit 38 from CA-60 E

40 min (40.5 mi)

5. Merge onto CA-110 N

0.5 mi

6. Use the right 3 lanes to take exit 24A to merge onto US-101 S toward I-5 S
   Parts of this road may be closed at certain times or days

   1.7 mi

7. Keep left at the fork to continue on San Bernardino Fwy, follow signs for I-10 E/San Bernardino

   1.2 mi

8. Continue onto I-10 E/San Bernardino Fwy

   23.4 mi

9. Take exit 42B for CA-71 S toward Corona

   0.4 mi

10. Keep left, follow signs for Devry Univ/Cal Poly Univ

    0.3 mi

11. Continue onto CA-71 S

    3.2 mi

12. Use the right 2 lanes to take exit 12 to merge onto CA-60 E toward Riverside
    Parts of this road may be closed at certain times or days

    9.6 mi

13. Take exit 38 for Archibald Ave

    0.3 mi

14. Turn right onto S Archibald Ave
    Pass by KFC (on the right)

    58 sec (0.2 mi)

Mountain View Elementary School District
Ontario, CA

APPENDIX B

Plant Species Observed

SCIENTIFIC NAME	COMMON NAME	WETLAND INDICATOR STATUS
ANGIOSPERMS (DICOTYLEDONS)		
ASTERACEAE	SUNFLOWER FAMILY	
Baccharis salicifolia	Mulefat	FAC
Cirsium sp.	Thistle	–
*Erigeron bonariensis**	Flax-leaved horseweed	FACU
Verbesina encelioides ssp. *exauriculata**	Golden crownbeard	FACU
BRASSICACEAE	MUSTARD FAMILY	
*Hirschfeldia incana**	Short-pod mustard	N/L
*Sisymbrium irio**	London rocket	N/L
AMARANTHACEAE	PIGWEED FAMILY	
*Amaranthus albus**	Pigweed amaranth	FACU
*Atriplex suberecta**	Peregrine saltbush	FACU
*Chenopodium album**	Lamb's quarters	FACU
*Salsola tragus**	Russian thistle	FACU
MALVACEAE	MALLOW FAMILY	
*Malva parviflora**	Cheeseweed mallow	N/L
SALICACEAE	WILLOW FAMILY	
Salix gooddingii	Black willow	FACW
SOLANACEAE	NIGHTSHADE FAMILY	
*Nicotiana glauca**	Tree tobacco	FAC
URTICACEAE	NETTLE FAMILY	
*Urtica urens**	Dwarf nettle	N/L
ANGIOSPERMS (MONOCOTYLEDONS)		
POACEAE	GRASS FAMILY	
*Cynodon dactylon**	Bermuda grass	FACU
Setaria sp.	Bristlegrass	–

*nonnative species

Wetland Status Codes:
OBL – Obligate Wetland; Almost always occur in wetlands
FACW – Facultative Wetland; Usually occur in wetlands, but may occur in non-wetlands
FAC – Facultative; Occur in wetlands and non-wetlands
FACU – Facultative Upland; Usually occur in non-wetlands, but may occur in wetlands
UPL – Obligate Upland; Almost never occur in wetlands
N/L – Plants that are Not Listed; Does not occur in wetlands in any region

APPENDIX C

Field Datasheets

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Arid West Region** See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Ontario Sports Complex City/County: Ontario/San Bernardino County Sampling Date: 11/13/2023

Applicant/Owner: Placeworks, Inc. State: CA Sampling Point: 1

Investigator(s): C.Brown, A.Dorough Section, Township, Range: Unsectioned Santa Ana Del Chino Land Grant

Landform (hillside, terrace, etc.): bottom of basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): LRR C Lat: 33.998096 Long: -117.610675 Datum: NAD 83

Soil Map Unit Name: Db - Delhi fine sand NWI classification: PUBHx

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

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
Hydrology appears to be from runoff from adjacent cropland and from adjacent irrigation pipes for adjacent cropland. Soils are significantly disturbed and include fill material as well as the runoff of soils from adjacent cropland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 10' x 10')			
1. *Atriplex suberecta*	40	Yes	FACU
2. *Chenopodium album*	40	Yes	FACU
3. *Verbesina encelioides ssp. exauriculata*	5	No	FACU
4.			
5.			
6.			
7.			
8.			
	85	=Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 15 % 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:	2	(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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	85 (A)		340 (B)

Prevalence Index = B/A = 4.00

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Loamy/Clayey	Silty clay soils with 20% organic roots present
3-5	2.5Y 4/2	100					Loamy/Clayey	sandy loam soils
5-18	5Y 4/2	100					Loamy/Clayey	clay loam soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Iron-Manganese Masses (F12) **(LRR D)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Algae is present underneath the soil surface in some areas with saturated soils within the bottom of the basin. Soils are significantly disturbed and include fill material as well as runoff of soils from adjacent croplands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- X Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:
Saturation present from 0-5 inches. Biotic crust present nearby but outside of sampling plot.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Arid West Region** See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Ontario Sports Complex City/County: Ontario, San Bernardino County Sampling Date: 11/13/2023

Applicant/Owner: Placeworks, Inc. State: CA Sampling Point: 2

Investigator(s): C.Brown, A.Dorough Section, Township, Range: Unsectioned Santa Ana Del Chino Land Grant

Landform (hillside, terrace, etc.): bottom of basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): LRR C Lat: 33.998177 Long: -117.610710 Datum: NAD 83

Soil Map Unit Name: Db - Delhi fine sand NWI classification: PUBHx

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

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

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 X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
Hydrology appears to be from runoff from adjacent cropland and from adjacent irrigation pipes for adjacent cropland. Soils are significantly disturbed and include fill material as well as the runoff of soils from adjacent cropland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 10' x 10')			
1. *Atriplex suberecta*	20	Yes	FACU
2. *Verbiscina enceloides ssp. exauriculata*	2	No	FACU
3. *Chenopodium album*	8	Yes	FACU
4.			
5.			
6.			
7.			
8.			
	30	=Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 70 % 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: 2 (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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	30 (A)		120 (B)

Prevalence Index = B/A = 4.00

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: 2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/2	100					Loamy/Clayey	loamy sand soils
2-19	5Y 5/2	100					Sandy	Sand soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______
Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Soils are significantly disturbed and include fill material as well as runoff of soils from adjacent croplands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) **(Nonriverine)**
___ Sediment Deposits (B2) **(Nonriverine)**
___ Drift Deposits (B3) **(Nonriverine)**
X Surface Soil Cracks (B6)
X 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 on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Arid West Region** See ERDC/EL TR-08-28; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: Ontario Sports Complex City/County: Ontario, San Bernardino County Sampling Date: 11/13/2023

Applicant/Owner: Placeworks, Inc. State: CA Sampling Point: 3

Investigator(s): C.Brown, A.Dorough Section, Township, Range: X

Landform (hillside, terrace, etc.): bottom of basin Local relief (concave, convex, none): concave Slope (%): <1

Subregion (LRR): LRR C Lat: 33.998118 Long: -117.610841 Datum: NAD 83

Soil Map Unit Name: Db - Delhi fine sand NWI classification: PUBHx

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

Are Vegetation ___, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X

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 X	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
Hydrology appears to be from runoff from adjacent cropland and from adjacent irrigation pipes for adjacent cropland. Soils are significantly disturbed and include fill material as well as the runoff of soils from adjacent cropland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 10' x 10')			
1. *Atriplex suberecta*	50	Yes	FACU
2. *Chenopodium album*	12	No	FACU
3. *Salsola tragus*	2	No	FACU
4. *Sisymbrium irio*	4	No	UPL
5. *Hirschfeldia incana*	2	No	UPL
6.			
7.			
8.			
	70	=Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
		=Total Cover	

% Bare Ground in Herb Stratum 30 % 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: 1 (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	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	64	x 4 =	256
UPL species	6	x 5 =	30
Column Totals:	70 (A)		286 (B)

Prevalence Index = B/A = 4.09

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, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: 3

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 %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/4	100					Loamy/Clayey	silty clay soils
8-18	5Y 4/2	98	7.5YR 4/4	2	C	PL/M	Loamy/Clayey	Silty clay loam soils

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRR C)**
___ 2 cm Muck (A10) **(LRR B)**
___ Iron-Manganese Masses (F12) **(LRR D)**
___ Reduced Vertic (F18)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ________
Depth (inches): ________

Hydric Soil Present? **Yes** X **No** ____

Remarks:
Soils are significanty disturbed and include fill material as well as runoff of soils from adjacent cropland. Presence of hydric soils could be relict from when this area was extensively irrigated and the basin was regularly inundated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) **(Nonriverine)**
___ Sediment Deposits (B2) **(Nonriverine)**
___ Drift Deposits (B3) **(Nonriverine)**
X Surface Soil Cracks (B6)
X 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 on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Wetland Hydrology Present? **Yes** X **No** ____

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

Remarks:

APPENDIX D

Representative Site Photographs

Photo 1. Waste Management Basin Located within Study Area with a Few Mulefat Shrubs and Black Willows Present in the Southeast Corner (Far Distance).

Photo 2. Mulefat and Black Willow Individuals Present Along the Southeastern Banks of the Waste Management Basin.

Photo 3. Saturated Soils Present in Waste Management Basin at the Time of Field Survey.

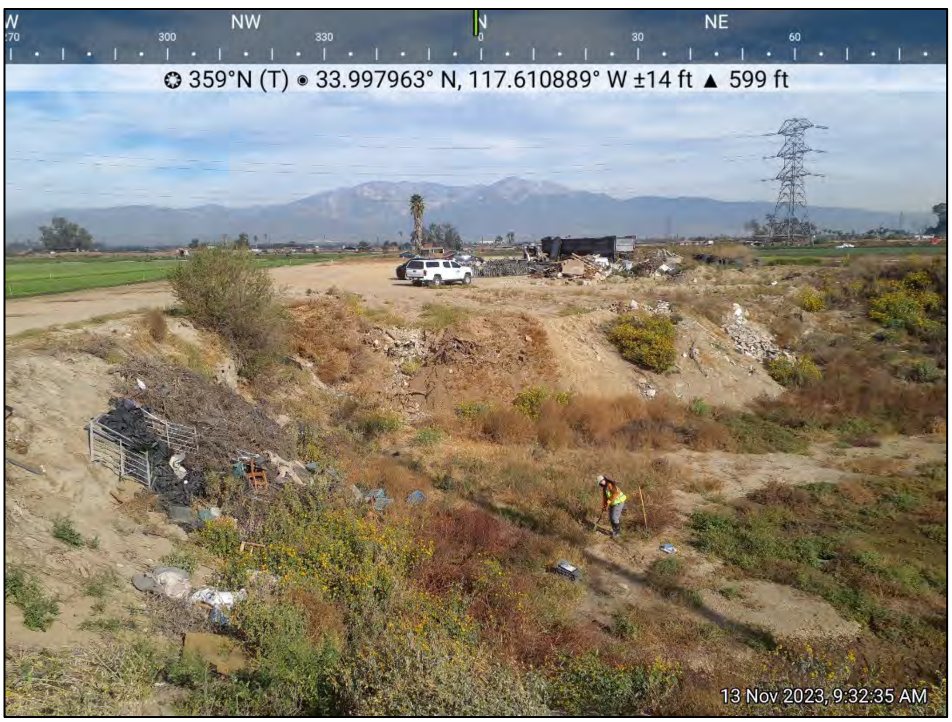


Photo 4. Disturbances Present, including Pieces of Old Furniture, Uprooted Vegetation, Dirt Fill, and Trash Present Along the Northern and Eastern Walls of the Basin.

Photo 5. Irrigation Piping Present Along the Eastern Boundary of the Study Area, Which Appear to Provide a Source of Hydrology to the Waste Management Basin.

Photo 6. Location of Upland Sample Point 1.

Photo 7. Location of Upland Sample Point 2.

Photo 8. Location of Upland Sample Point 3.

Appendix F1 Cultural Resources Update

Appendices

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January 5, 2023

Nicole Vermilion
PlaceWorks, Inc.
Sent via email: nvermilion@placeworks.com

RE: California Historical Resources Information System Records Search Results and Architectural Evaluation Update for the Ontario Regional Sports Complex Project, Ontario, California

Greetings:

At the request of PlaceWorks, Inc., ECORP Consulting, Inc. conducted an updated records search of the California Historical Resources Information System (CHRIS) and an architectural evaluation update for the Ontario Regional Sports Complex Park Project. The Ontario Regional Sports Complex will include a semi-professional Minor Leage baseball stadium, retail and hospitality areas, a new City of Ontario recreation and aquatics center, and fields for sports such as baseball, soccer, and softball. Additionally, the Project proposes offsite improvements for water and sewer lines, improvements to the existing Chino Avenue, and new road construction to extend Vineyard Avenue on the west end of the Project area. The Project is situated within the boundaries of the Armstrong Ranch Specific Plan (City of Ontario 2016), which includes a previously an updated cultural resource records search summary and Phase II Historical and Architectural Significance Evaluation report (White 2016a, 2016b). The current updated records search and architectural evaluation update were completed to support the Project's proposed California Environmental Quality Act (CEQA) requirements. The following is a description of the CHRIS search results, the architectural evaluation update results, and recommended potential mitigation measures.

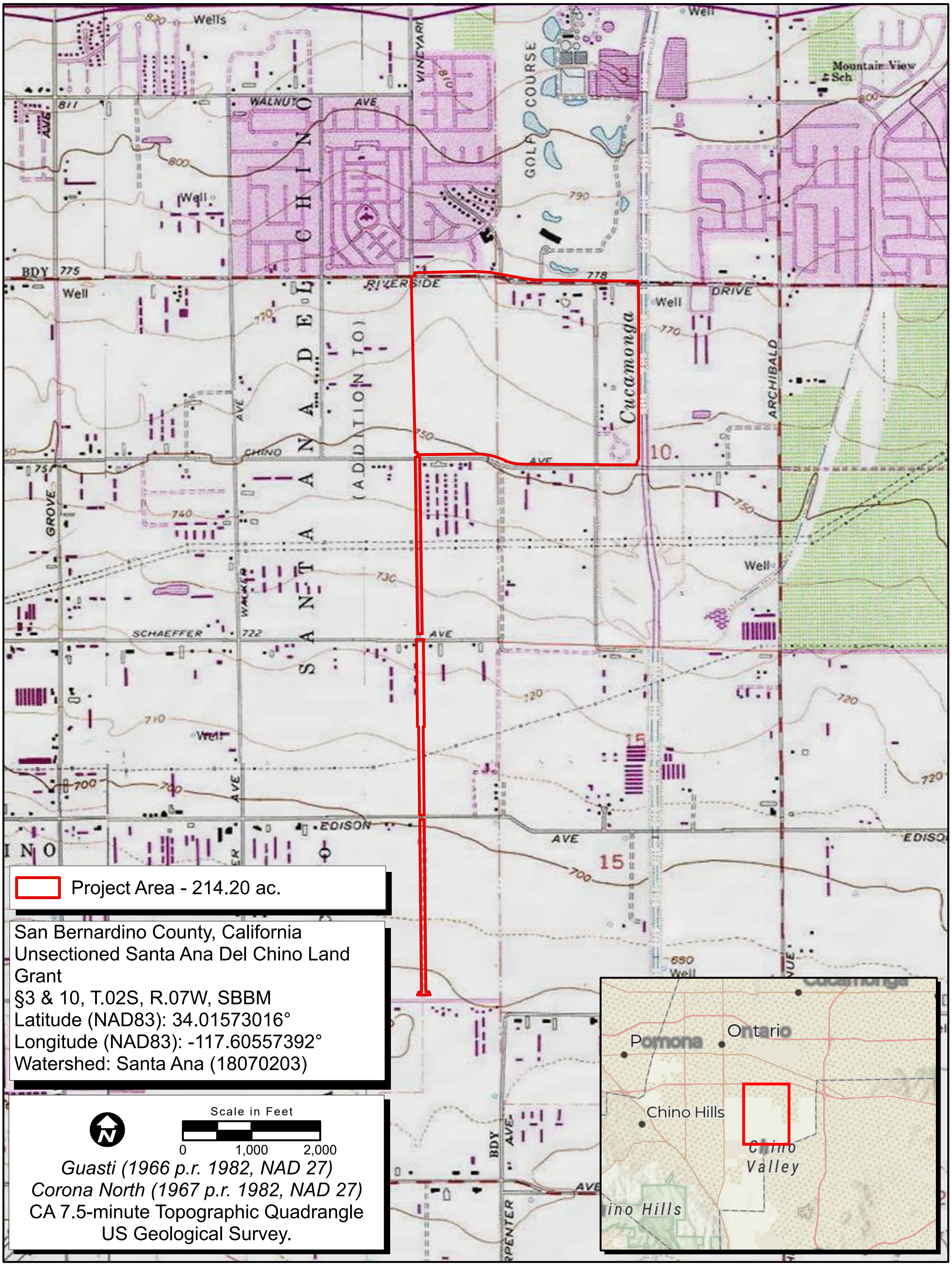
RECORDS SEARCH

Records Search Methods

ECORP conducted an updated records search for the Project Area at the South Central Coastal Information Center of the CHRIS at California State University-Fullerton on October 11, 2023 (Appendix A). The purpose of the records search was to determine the extent of previous surveys within 1 mile (1,600 meters) of the Proposed Project Area (Figure 1), and the presence of previously documented pre-contact or historic archaeological sites, historic-age structures, and features.

Records Search Results

Forty-three previous cultural resources investigations have been conducted within 1 mile of the Project Area, covering approximately 25 percent of the total area surrounding the Project Area within the records search radius (Appendix A). Of the 43 studies within the 1-mile radius, seven overlap the Project Area (Table 1). Appendix A lists the reports located within the Project Area and the 1-mile radius. These studies revealed the presence of pre-contact sites including lithic scatters, and historical sites including former farmhouses, electrical transmission structures, single-family residences, wells, cisterns, roads, and sites



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Location_Vicinity\Location and Vicinity.aprx - OBP LnV 20240104 (kedwards - 1/4/2024)

Map Date: 1/4/2024

Sources: ESRI, USGS

Figure 1. Project Location and Vicinity

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2023-177 Ontario Ball Park

associated with residential trash dumping. The previous studies were conducted between 1976 and 2016 and vary in size from 0.25 acre to 1,122 acres.

Table 1. Previous Cultural Studies that include or are within the Project Area			
Report Number	**Author(s)**	**Report Title**	**Year**
SB-317	Patricia Martz	Description and Evaluation of the Cultural Resources: Cucamonga, Demens, Deer, and Hillside Creek Channels, San Bernardino and Riverside Counties, California	1976
SB-800	Joseph E. Hearn	Archaeological-Historical Resources Assessment for Chino Avenue/Walker Avenue to Cucamonga Channel	1979
SB-5424	"Tom" Bai Tang, Deirdre Encarnacion, Daniel Ballester, Josh Smallwood, and Terri Jacquemain	Historical/Archaeological Resources Survey Report: Planning Area 4, Riverside Drive and Walker Avenue, City of Ontario, San Bernardino County, California	2006
SB-5702	Beth Gordon	CA8118/SCE Grove, 13524 South Grove Ave, Ontario, San Bernardino County, California 91761	2004
SB-5976	Matthew Wetherbee, Sarah Siren, and Gavin Archer	Cultural Resource Assessment New Model Colony East Backbone Infrastructure, City of Ontario, San Bernardino County, California	2007
SB-7977	Lee Panich, Tsim D. Schneider, and John Holson	Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 and 3), San Bernardino County California	2010

The results of the records search indicate that 95 percent of the Project Area has been previously surveyed for cultural resources. These studies were conducted in smaller segments, at different times, by different consultants. In addition, the Armstrong Ranch Specific Plan's Final Environmental Impact Report was completed 2017 and encompasses approximately 95 percent of the Project Area. The associated cultural resources report conducted updated records search and field visits to the Project Area to evaluate four historic-age structures, described further below (White 2016a, 2016b).

The records search also determined that 24 previously recorded pre-contact and historic-era cultural resources are located within 1 mile of the Project Area (Table 2). Of these, one is believed to be associated with Native American occupation of the vicinity and 23 are historic-era sites associated with mid-century housing development patterns. There are four previously recorded cultural resources within or adjacent to the Project Area, all of which are historic-age structures that are related to property formerly owned by Major Corliss Champion Moseley, but believed to have been built after he sold the property. No other archaeological resources were documented within the Project Area.

Table 2. Previously Recorded Cultural Resources within 1 mile of the Project Area					
Site Number CA-SBD-	**Primary Number P-36-**	**Recorder and Year**	**Age/ Period**	**Site Description**	**Within Project Area?**
–	12195	Pamela Daily 2005	Historic	Building, Structure	No
–	12533	Robert Porter and William Jenson 2005	Historic	Site	No
–	13229	Josh Smallwood 2006	Historic	Building	No
–	13230	Josh Smallwood 2006	Historic	Building	No
–	13231	Josh Smallwood 2006	Historic	Building	No
–	13232	Josh Smallwood 2006	Historic	Building	No
–	13233	Josh Smallwood 2006	Historic	Building	No
–	13234	Josh Smallwood 2006	Historic	Building	No
–	13235	Josh Smallwood 2006	Historic	Building	No
–	13236	Josh Smallwood 2006	Historic	Building	No
–	13237	Josh Smallwood 2006	Historic	Building	No
–	13238	Josh Smallwood 2006	Historic	Building	No
–	13239	Josh Smallwood 2006	Historic	Building	No
–	13240	Josh Smallwood 2006	Historic	Building	No
–	13241	Josh Smallwood 2006	Historic	Building	Yes
–	13242	Josh Smallwood 2006	Historic	Building	Yes
–	13243	Josh Smallwood 2006	Historic	Building	Yes
–	13244	Josh Smallwood 2006	Historic	Building	Yes
–	23548	Michael H. Dice 2011	Historic	Building	No
–	24866	Dana E. Supernowicz 2010	Historic	Building	No
–	25440	Wendy L. Tinsley Becker 2010	Historic	Structure	No
–	26051	Riordan Goodwin 2019	Historic	Structure	No
33019H	33019	Jennifer Stropes 2019	Historic	Site	No
–	33020	Jennifer Stropes 2019	Pre-contact	Other	No

White (2016b) summarized the results of a Phase II significance evaluation for a total of six properties that were recorded within the Armstrong Ranch Specific Plan. The evaluations were made pursuant to criteria for eligibility for the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), and The City of Ontario's Historic Context for the New Model Colony Plan Area (White

2016b). Of the six properties, four properties were determined to be historic age and therefore were recorded and evaluated. The following summarizes the findings for the four resources.

Resource P-36-13241, referred to as 9381-A Riverside Drive, is a historic structure consisting of a one-story, Ranch-style, single-family residence recorded by Josh Smallwood in 2006. Construction on the property had been observed in archival research as early as 1937 with significant increase of development between 1942 and 1945. The property was owned during this period by Major Corliss Champion, founder of Orange Blossom Dairy Farm. The farm was sold twice in 1945 and was renamed Ellsworth Ranch by new owner Rex C. Ellsworth (Smallwood 2006a). Ellsworth owned the property until 1975 and operated a breeding ranch for race horses (White 2016b). Smallwood evaluated the resource as not eligible for listing in the NRHP/CRHR.

Resource P-36-13242, referred to as 9381-B Riverside Drive, is a historic structure consisting of a multi-family residence of mixed construction with a vernacular design recorded by Josh Smallwood in 2006. The building was purported to have been used as farm worker's quarters associated with the Orange Blossom Dairy Farm/Ellsworth Ranch (Smallwood 2006b). Smallwood evaluated the resource as not eligible for listing in the NRHP/CRHR.

Resource P-36-13243, referred to as 9381-D Riverside Drive, is a historic structure consisting of a one-story Ranch-style building recorded by Josh Smallwood in 2006. The structure appeared at time of documentation to be a storage barn that had since been partially converted into a residence associated with the Orange Blossom Dairy Farm/Ellsworth Ranch (Smallwood 2006c). Smallwood evaluated the resource as not eligible for listing in the NRHP/CRHR.

Resource P-36-13244, referred to as 13165 Ontario Avenue, is a historic structure consisting of a one-story single-family residence with a vernacular design recorded Josh Smallwood in 2006. Archival research indicates the structure was constructed around 1949 by property owner John R. Stewart, with improvements completed in the late 1950s (Smallwood 2006d). Smallwood evaluated the resource as not eligible for listing in the NRHP/CRHR.

White (2016b) reevaluated the three resources that are located at 9381 Riverside Drive (P-36-13241 through P-36-13243) and concluded that although the complex does not appear to be eligible for inclusion on the NRHP under Criteria A, B, C, or D; due to the resources' association with Ellsworth, who was a known west coast horse breeder and owner of a number of successful race horses, he determined that the three resources at 9381 Riverside Drive appear eligible for inclusion on the CRHR under Criteria A and B, as well as for local significance pursuant to the City's Historic Context guidelines.

Based on the above information, ECORP completed an architectural evaluation update for the three resources at 9381 Riverside Drive (P-36-13241 through P-36-13243).

ARCHITECTURAL EVALUATION UPDATE METHODS

Field Visit

ECORP Architectural Historian Andrew Bursan, MCRP, conducted an intensive survey of resources P-36-13241, P-36-13242, and P-36-13243 at 9381 E. Riverside Drive (Assessor Parcel Numbers 0218-102-11-0000 and 0218-102-10-0000) on December 13, 2023. Mr. Bursan meets the Secretary of the Interior's Professional Qualification Standards for architectural history. The survey entailed walking around the building exteriors on the property, documentation with notes and photographs, noting of character-defining features, spatial relationships, observed alterations, and examining any historic landscape features on the properties.

Building Development and Archival Research

ECORP performed building development and archival research for the 9381 E. Riverside Drive property to establish a thorough and accurate historic context for the significance evaluations, and to confirm the building development history of 9381 E. Riverside Drive and associated parcels.

City of Ontario Building Department

ECORP obtained digitized permits from the City of Ontario Building Department via email on December 18, 2023 for 9381 E. Riverside Drive. ECORP obtain only two building permits: 2009 (Permit #B201000508) and 2011 (Permit #B201000506), both for an above-ground water tank system. ECORP reviewed all available permits and all information obtained from the City of Ontario was used in the preparation of the historic context and significance evaluations. The original building permits for the property were not located.

San Bernardino County Assessor

ECORP obtained assessor data for 9381 E. Riverside Drive on December 11, 2023. This assessor data gave information about construction dates and current owners.

Ontario History Room, Ontario Public Library

ECORP visited the Ontario Public Library on December 13, 2023 to research the subject property. ECORP also obtained information from the Ontario History Room via email on December 15, 2023 relating to an article about the property. The Ontario History Room's Collections included newspaper clippings, city directories, scrapbooks, digitized e-books, and historical photographs. All available information obtained from the library was used in preparation of the historic context and significance evaluations.

Historical Newspaper Review

ECORP reviewed historical newspapers from Ontario and surrounding cities in an effort to understand the development of the City of Ontario and 9381 E. Riverside Drive. These documents were used in preparation of the historic context and significance evaluations.

Historical Aerial Photographs

A review of historical aerial photographs was conducted as part of the archival research effort for the following years: 1938, 1948, 1949, 1959, 1966, 1980, 1985, 1994, 1999, 2002, 2003, 2005, 2009, 2010, 2012, 2014, 2016, 2018, and 2020 (National Environmental Title Research LLC [NETR] 2023; University of California-Santa Barbara 2023).

Built Environment Resources Directory

ECORP reviewed the California Built Environment Resources Directory for San Bernardino County but the property at 9381 E. Riverside Drive in the Project Area was unlisted.

City of Ontario Historic Context

ECORP reviewed the City of Ontario Historic Context for the New Model Colony, which focuses on the history of the dairy industry in Ontario (Galvin 2004). Although the 9381 E. Riverside Drive property has functioned as a dairy since the late 1970s this is outside the period of significance and identified historic context range identified as being from 1900 to 1969. Therefore, this historic context was not applicable to the dairy history of the property.

HISTORIC CONTEXT

City of Ontario

In 1881, George Chaffey created the Etiwanda Irrigation community and used a series of flumes from the nearby mountains to irrigate the town then known as Etiwanda. By 1882, he had expanded his business to cover other areas of the former Rancho Cucamonga land grant including the planned community Ontario, named after his homeland in Canada (Upland Heritage 2021).

In 1887, the Atchison Topeka and Santa Fe Railroad passed through Ontario and Upland and the Upland railway station was subsequently constructed by the Bedford brothers. Due to the new train line that made it easier for locals to go to jobs outside the neighborhood, the area saw rapid growth and the construction of both residential and commercial properties. (Upland Heritage 2021). On December 10, 1891 the City of Ontario was incorporated as a city of 0.38 acre (City of Ontario n.d.a.).

The Chaffey brothers founded and constructed Chaffey College, a University of Southern California affiliate school, at 1245 Euclid Avenue in Ontario in 1901. From 1901 to 1960, it taught both high school and college courses. The Federal Works Project Administration replaced the original Chaffey College buildings in the 1930s. Chaffey College relocated to Rancho Cucamonga in 1960, and the original structure became Chaffey High School. (City of Ontario n.d.b).

In 1903, an act of Congress declared Ontario a "Model Irrigation Colony," noting innovations in standards of urban living, and served as an example of a successful irrigation project. The concrete irrigation systems and municipal water systems installed by the Chaffey brothers inspired nearby communities to follow suit (City of Ontario n.d.a).

Construction began on Pikes Peak Ocean to Ocean Highway through Ontario in 1912. As automobiles became more popular, and the Pikes Peak route became more complete in the 1920s, property owners along Holt Boulevard began to cater increasingly to motorists. Many residences were partly or fully converted into drive-up restaurants and farmers built roadside shacks to sell produce (City of Ontario n.d.c).

In 1923, taking advantage of some flat, unused crop land, businessmen Waldo Waterman and Achie Mitchell established Latimer Field. After being forced to relocate their aviation hobby multiple times, Mitchell and Waterman eventually settled at what is now Ontario World Airport. The airport served as a vital training ground for pilots during World War II (WWII; City of Ontario n.d.a).

In 1996, thanks to potential customers from the airport, as well as the 10, 60, and 15 freeways, Ontario developed what at the time was the largest single-story shopping mall in the world and the largest shopping center of any kind in California, the 131-acre Ontario Mills Mall. The Ontario Mills Mall developers intended it to meld amusement park and shopping mall elements to attract more consumers than either could alone. The AMC theater that opened at the mall featured 30 screens and was the one of biggest theaters in the world at the time of its completion (White 1996).

Today Ontario has an estimated population of approximately 179,000 people. The three main industries in Ontario are retail sales, transportation, warehousing, and health care. The population averages 3,507 people per square mile in Ontario (U.S. Census Bureau 2023).

California Ranch Properties

“For the last hundred years,” writes geographer Paul F. Starrs, “the fundamental unit of a livestock operation in the western United States has been the home ranch” (Starrs 1998). In California, the home ranch traces its roots to no-fence laws of the 1870s. No-fence laws shifted the burden of fence building from farmers to ranchers, signaling the end of free-range grazing as practiced on California’s Mexican-era ranchos (Jelinek 1982). Whereas ranchers had previously grazed their animals on California grasses with no regard for property boundaries, after 1870 they began acquiring their own private ranges enclosed within fences. The entire operation, called a home ranch, included family residences and outbuildings.

Unlike fruit orchards and other types of intensive agriculture where farmers supported families on 5, 10, or 20 acres by producing high-value farmed goods, ranching required vast acreage to raise cattle and sheep. “The term home ranch,” writes Starrs, “asserts viability, a size and substance sufficient to claim permanence and self-reliance” (Starrs 1998) It represented extensive agriculture, where supporting a family might require 160 acres or more. Home ranches were characterized by vast open spaces where herds roamed and grazed. If well located, they possessed flowing streams or groundwater wells for watering stock and irrigating fields planted in alfalfa or other forage crops. Spatially, home ranches were also characterized by flexibility: a rancher could add adjoining acreage to increase the size of a ranch or sell off portions when cash was needed.

The nucleus of the home ranch was the headquarters, typically set upon high ground and fronting a rural county road. The headquarters contained the main house for the ranching family. Architecturally, the main houses built on home ranches through the first half of the 20th century differed little from houses built in town. They ranged from modest Minimal Traditional-style dwellings and prototypical Ranch-style houses to elaborate revival-style residences (Packard 1995). Around the main house stood a cluster of buildings, structures, and landscape features that supported ranching activities. These included barns, corrals, housing for ranch hands, stables for horses, shade trees, water towers, windmills, repair shops, and storage sheds for miscellaneous supplies (Starrs 1998). Silos and chicken coops were also common features of home ranches (Packard 1995). Many western ranches, particularly those in mountain states, had special enclosures for livestock and poultry, but benign winter weather in California made “light and cheap shelter” sufficient. “It is, in fact, frequently dispensed with altogether” noted an observer of 1920s California ranches (Wickson 1923).

Ranch Style (1930-1975)

All dwellings at 9381 E. Riverside Drive are Ranch-style houses. Ranch-style houses in California reflect a national trend of fascination with the “Old West” and were a building style of choice for tract housing. Ranch homes were originally developed in the western and southwestern U.S., but quickly gained national popularity through the dissemination of do-it-yourself manuals and plans in national magazines such as Sunset, Better Homes and Gardens, and House Beautiful. Later, ranch houses were popular as a custom-built type of housing, which was especially popular in the late 1940s and 1950s. Ranch houses were typically built between 1930 and 1975, but peaked in the 1950s, as the most prevalent type of post-WWII suburban tract-style housing, often housing veterans who secured housing with Federal Housing Authority loans.

Ranch style houses are usually a one-story, single-family residence. Houses designed in this architectural style include several identifying characteristics such as rambling, elongated plans; a horizontal emphasis; general asymmetry; free-flowing interior spaces; and a designed connection to the outdoors. Features such as low-pitched roofs with wide eaves, a combination of cladding materials including board-and-batten siding, brick and stone chimneys, and large picture windows were commonly applied and evoked an aesthetic that was reminiscent of these past architectural traditions. Decorative features such as wood shutters and dovecotes were often added to enhance the rusticated appearance of Ranch houses (Grimes and Chiang 2009; Horak et al. 2015; McAlester 2013).

Character-defining features include:

- rambling, elongated plans with a horizontal emphasis;
- one to two stories in height;
- low-pitched gabled or hipped roofs with overhanging, open eaves;
- general asymmetry;
- free-flowing interior spaces;
- designed connection to the outdoors;
- cladding featuring stucco, board and batten, shingles, clapboard, or a combination of materials;

- brick or stone chimneys details;
- attached garages often linked to residence by breezeways;
- stone, brick, board and batten, clapboard, or horizontal wood siding used for accent on walls, secondary cladding types, and planters;
- functional and non-functional shutters details as trim around windows; and
- fenestration may include a picture window.

Development History of 9381 E. Riverside Drive

The 80-acre property at 9381 E. Riverside Drive first appears in a 1938 aerial image that depicts the property as having about 7 acres of planted trees in a rectangular formation near E. Riverside Drive on the northeast corner of the property. During this period, no buildings appear on the property and besides the 7-acre tree grove, the rest of the parcel looks fallow (NETR 2023).

By the time of the next aerial image in 1948, seven buildings including two single-family dwellings and five ancillary ranch buildings are seen clustered on the northeast corner of the property, replacing a portion of the former tree grove. The remaining portion of the property contains three large square corrals each ranging in size from 20 to 30 acres (NETR 2023).

By the late 1970s, the property had much of the same configuration as the 1940s but with the addition of two rectangular Ranch-style dwellings including a street facing 20-foot by 90-foot house and a 20-foot by 50-foot single-family dwelling at the center of the building cluster on the northeast corner of the property (NETR 2023).

After the property converted to a dairy in the late 1970s, four new buildings appear on the property including a street-facing circa 1978 Ranch-style house near the centered main entrance to the property. The dwelling is flanked to the west by a circa 1978 dairy barn-style building. By 1985 two hay storage canopies were at the center of the property. In 1994, six new linear cattle feeding trough canopies span the southern end of the property ranging from 450 feet to 1,000 feet in length. The property owners have not added new buildings or structures to the property since 1994 (NETR 2023).

Ownership History

Research shows the property having been used for agricultural purposes since the 1930s. In the early 1940s, Major C.C. Moseley operated the property briefly as a cattle ranch and later sold it in 1945 to restaurant chain owner W. "Tiny" Naylor in 1945. The property again sold to Rex Ellsworth in 1947 who operated it as an 80-acre thoroughbred racehorse breeding farm. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby horse Swaps, Ellsworth's main horse breeding and training operations were 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate Swaps and subsequent winning horses trained by Ellsworth with the Chino location, which he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. The subject property most likely acted as an ancillary facility to their main operation in

Chino which was about 220 acres larger. The De Boer family purchased the property in the late 1970s and have operated a dairy on the property to the present day (San Bernardino County Sun 1947; The Mirror 1953; Chino Champion 1975).

PROPERTY DESCRIPTION

The 80-acre property at 9381 E. Riverside Drive contains dwellings and farm structures on the north end of the property and long, linear cattle corrals spanning the southern two-thirds of the property. An L-shaped gravel driveway leads to the center of the cluster of buildings at the north end of the property.

At the far northeast end of the property is a circa 1947 one-story, single-family, Ranch-style dwelling (P-36-13242) topped by a side gabled roof with slightly overhanging eaves (Figure 2). The rectangular shaped house features rough textured stucco and a chimney centered on the front façade. Besides one aluminum slider window on the front elevation, all window treatments and doors have been removed, leaving only window and door openings or window openings boarded with plywood.

Just to the west sits a circa 1966 one-story, single-family, Ranch-style dwelling (P-36-13241) topped by a cross gabled roof with rounded bargeboards on the projecting front gabled eastern section of the house (Figure 3). L-shaped in plan, the house features non-original rough textured stucco which is punctuated by non-original vinyl frame windows on all elevations. A flat panel wood door highlights the west end of the front façade and serves as the primary entrance.

Figure 2. Southern façade (view northwest; December 13, 2023).

Figure 3. Northern façade (view southeast; December 13, 2023).

Further to the south is a small circa 1955 one-story, single-family, Ranch-style house surmounted by a side gabled roof with a projecting wing on the east elevation topped by a front gabled roof. The house sits on a T-shaped plan with rough textured stucco cladding exterior elevation and vinyl frame windows interspersed on all sides of the dwelling (Figure 4).

This dwelling is flanked to the south by a circa 1948 one-story, single-family, Ranch-style house (P-36-13243) on an L-shaped plan (Figure 5). A side gabled roof tops the house and features three decorative dovecote vents along the peak. Non-original rough textured stucco clads exterior surfaces and fenestration consists of non-original vinyl frame windows on all sides. Two wood frame doors on the east end of the south elevation provide the primary entrance along with three garage door openings on the same façade. Decorative vents punctuate gable faces.

Figure 4. Eastern façade (view west; December 13, 2023).

Figure 5. Western and Southern façades (view southwest; December 13, 2023).

At the very south end of the building cluster sit two circa 1948 farm storage buildings and 12 canopy structures built in the 1980s (Figure 6). The northernmost farm storage building features a front gabled corrugated metal roof, rough textured stucco cladding, and a rectangular plan. A sliding wood door serves as the primary entrance to the western façade. The building has limited fenestration and an exposed southern elevation.

The other circa 1948 farm storage building to the south is of corrugated metal construction and topped by a front gabled roof. Exposed sections of the building on the east and south elevations provide entrance to the building.

The property's northwestern corner contains a circa 1978 Ranch-style dwelling and dairy barn structure (Figures 7 and 8). The one-story Ranch-style dwelling features a side gabled roof, a rectangular plan, and rough textured stucco cladding with brick trim. Fenestration consists of aluminum slider windows on all sides. A centered and projecting front gabled section of the roof shelters a wood frame door which provides the primary entrance to the house that is by a brick chimney. Just to the west is a two-story, front gabled dairy barn on a rectangular plan. Window treatments consist of three aluminum slider windows on the primary north elevation. Two flat panel wood doors act as entrance ways on the primary façade and the west elevation contains three freight entrances with metal roll-up doors. Four brick pilasters on the primary façade distinguish the building.

Flanking the two farm storage buildings, to the east and west, are two hay canopy shelters with corrugated metal shed roofs supported by square wood posts. The remainer of the property to the south consists of six new linear cattle feeding trough canopy shelters spanning the southern end of the property ranging from roughly 1,000 feet to 450 feet in length. No new buildings or structures have been added to the property since 1994. Vegetation on the property consists of a grass lawn that sounds the dwelling on the north end of the property and one pine along the north property line.

Figure 6. Eastern façade (view southwest; December 13, 2023).

Figure 7. Northern façade (view south; December 13, 2023).

Figure 8. Northern façade (view southeast; December 13, 2023).

EVALUATION

The property at 9381 E. Riverside Drive (P-36-13241, P-36-13242, and P-36-13243) does not meet any of the criteria for listing in the NRHP, CRHR, or as a City of Ontario Historic Landmark individually or as part of an existing historic district, as demonstrated below.

NRHP/CRHR Criterion A/1

Research shows the property at 9381 E. Riverside Drive as having been used for agricultural purposes since the 1930s. It later operated as a cattle ranch, thoroughbred racehorse breeding ranch, and finally as a dairy. While the property shares a history with thoroughbred horseracing, horse breeder Rex Ellsworth only used the property as his main headquarters from 1947 to 1953 before he achieved greater success after moving his headquarters to a Chino property 7 miles to the west. Evidence did not suggest that other uses of the property, including a cattle ranch and later a dairy started in the late 1970s, played an important role in events of the past. Both cattle ranches and dairies stand as common-place agricultural activities for the area and no information was located indicating that the property is associated with important innovations in ranching or dairy production. Research found no association with more specific events or patterns of development that have historical significance at the local, state, or national level. For these reasons, ECORP found 9381 E. Riverside Drive not eligible for the NRHP/CRHR under Criterion A/1.

NRHP/CRHR Criterion B/2

Previous owners of the 9381 E. Riverside Drive property include C.C. Moseley, who operated the property briefly as a cattle ranch, restaurant chain owner W. "Tiny" Naylor, and Rex Ellsworth, who operated it as an 80-acre thoroughbred racehorse breeding farm starting in 1947. The De Boer family has operated a dairy on the property since the late 1970s. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby winning horse Swaps, Ellsworth's main horse breeding and training operation was 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate the racehorse Swaps and subsequent winning horses trained by Ellsworth with the Chino location, which he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. In addition, research found no indication that other property owners, besides Ellsworth, made a significant contribution to local history. There is no information in the archival record to suggest that the 9381 E. Riverside Drive is associated with the lives of persons significant in our past and ECORP found the property not eligible for the NRHP/CRHR under Criterion B/2.

NRHP/CRHR Criterion C/3

9381 E. Riverside Drive represents a typical example of an agricultural property with Ranch-style dwellings and similar properties can be found throughout southwest San Bernardino County to the present day. The Ranch style dwellings on the property lack features found in better examples of the style such as board-and-batten siding, diamond pane windows, x-bracing, and more rambling plans. Research found no evidence that any of the dwellings on the property are the work of a master. Ancillary farm storage buildings and corrals have utilitarian designs and few distinguishable architectural characteristics. No building on the property embodies the distinctive characteristics of a type, period, or method of construction, or represents a significant and distinguishable entity whose components may lack individual distinction. Therefore, ECORP found 9381 E Riverside Drive not eligible for the NRHP/CRHR under Criterion C/3.

NRHP/CRHR Criterion D/4

The information potential of 9381 E. Riverside Drive is expressed in its built form and in the historical record. It has not yielded, nor is it likely to yield, information important in history or prehistory. ECORP found 9381 E. Riverside Drive not eligible for the NRHP/CRHR under Criterion D/4.

Integrity

9381 E. Riverside Drive maintains integrity of setting because the buildings on the property have not been relocated. The De Boer Dairy has operated the property since the late 1970s and completely reconfigured the corrals on the property and added a few new canopy shelters and two farm storage buildings. Dairy operation changes since the 1970s have dramatically changed the relationship between buildings and general farm operation from the 1947 period of significance. Due to this drastic change of use and physical layout, the property no longer retains integrity of setting, feeling, and association. The oldest buildings on the property are Ranch-style dwellings built from roughly 1947 to the 1960s. These dwellings have all undergone significant alterations including the replacement of original windows with vinyl frame windows, the replacement of original doors, cladding in non-original stucco, and building additions. The alterations have removed what few character-defining features the dwellings had. In addition, the two ancillary farm buildings have replacement cladding and altered entranceways. Therefore, the property lacks integrity of design, materials, and workmanship. Regardless of integrity, due to lack of historical significance, 9381 E. Riverside Drive does not meet NRHP or CRHR eligibility criteria as an individual resource or as part of any known or suspected historic district; the resource is not listed on any Certified Local Government historic property register.

City of Ontario Historic Landmark Designation

An individual City of Ontario Historic Landmark must meet the following criteria contained in the Ontario Development Code Section 4.02.050 on its own merit:

1. It meets the criteria for listing in the National Register of Historic Places or

Per the significance evaluation above, ECORP found the property not eligible for the NRHP under any criterion.

2. It meets the criteria for listing in the California Register of Historic Resources or

Per the significance evaluation above, ECORP found the property not eligible for the CRHR under any criterion.

3. It meets one or more of the following criteria:

A. It exemplifies or reflects special elements of the City's history

The property exhibits a history typical of agricultural properties in the area and does not have special elements of the City's history.

B. It is identified with persons or events significant in local, state, or national history

Previous owners of 9381 E. Riverside Drive include C.C. Moseley, who operated the property briefly as a cattle ranch, restaurant chain owner W. "Tiny" Naylor, and Rex Ellsworth, who operated it as an 80-acre thoroughbred racehorse breeding farm starting in 1947. The De Boer family has operated a dairy on the property since the late 1970s. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby horse Swaps, Ellsworth's main horse breeding and training operation was 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate the racehorse Swaps and subsequent winning horses trained by Ellsworth with the Chino location that he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. There is no information in the archival record to suggest that 9381 E. Riverside Drive is associated with the lives of people significant in local, state, or national history.

C. It is representative of the work of a notable builder, designer, architect, or artist

Research found no evidence that 9381 E. Riverside Drive represents the work of a notable builder, designer, architect, or artist. Therefore, ECORP finds the property not eligible for association with notable builders, designers, architects, or artists.

D. It embodies distinguishing architectural characteristics of a style, type, period or method of construction

9381 E. Riverside Drive represents a typical example of an agricultural property with Ranch-style dwellings and similar properties can be found throughout southwest San Bernardino County to the present day. Ranch-style dwellings on the property lack the character-defining elements of the style such as board-and-batten siding, diamond pane windows, x-bracing, and more rambling plans. Ancillary farm storage buildings and corrals have utilitarian designs and few distinguishable architectural characteristics. Therefore, ECORP finds the property not eligible for embodying a distinguished architectural characteristic of a style, type, period, or method of construction.

E. It is noteworthy example of the use of indigenous materials or craftsmanship

The property at 9381 E. Riverside Drive contains Ranch-style dwellings and utilitarian farm buildings all built after WWII. They represent typical building types and construction methods of the era and ECORP finds the property not eligible for association with indigenous materials or craftsmanship.

F. It embodies elements that represent a significant structural, engineering, or architectural achievement or innovation

The property at 9381 E. Riverside Drive contains Ranch-style dwellings and utilitarian farm buildings all built after WW II. The current dairy operation has arranged corrals and farm-related elements much like other dairies in the area. Therefore, ECORP finds the property not eligible for representing a significant structural, engineering, or architectural achievement or innovation.

G. It has a unique location, a singular physical characteristic, or is an established and familiar visual feature of a neighborhood, community of the City

The property at 9381 E Riverside Drive is in an agricultural area on the southern end of the City of Ontario among many properties of a similar type and configuration. Therefore, ECORP finds the property not eligible as it does not represent a unique location, a singular physical characteristic, and is not an established and familiar visual feature of a neighborhood or community of the City.

H. It is one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen

Ontario and southwestern San Bernardino County contain several dairy and agricultural operations similar to the property at 9381 E. Riverside Drive. Therefore, ECORP finds the property not eligible as one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen.

Findings and Conclusions

No historic built environment resources were identified within the 9381 E. Riverside Drive property because of extensive archival research, field survey, and property significance evaluation. Therefore, the property is not considered a historical resource for the purposes of CEQA. Further, no potential indirect impacts to historical resources were identified.

RECOMMENDATIONS

Based on the updated records search results and the previous cultural resource studies completed, approximately 95 percent of the Project Area has been previously surveyed; however, most of the offsite improvement locations have not been previously studied. All of the historic structures located within the Project Area were previously evaluated as not eligible; whether or not there was agency concurrence on those findings is not known. In addition, ECORP reevaluated the property at 9381 E. Riverside Drive (P-36-13241, P-36-13242, and P-36-13243) and found it not eligible under any of the criteria for listing in the NRHP, CRHR, or as a City of Ontario Historic Landmark individually or as part of an existing historic district. Therefore, the property is not considered a historical resource for the purposes of CEQA and no further action is required for the resources. Although there are no current known archaeological resources within the Project Area, the areas of the Project that have not been surveyed or studied could contain archaeological resources. ECORP recommends implementing the mitigation measures below to minimize potential impacts to cultural resources within the Project Area:

Cultural Resources

CUL-1 Prior to the start of construction, the Project Proponent shall retain a qualified professional archaeologist to monitor all ground-disturbing activities associated with Project construction. Monitoring is not required for placement of equipment or fill inside excavations that were monitored, above-ground construction activities, or redistribution of soils that were previously monitored (such as the return of stockpiles to use in backfilling). The Monitoring Archaeologist shall meet or work under the direct supervision of someone meeting the Secretary of the Interior’s professional qualifications standards for prehistoric and historic archaeology. The archaeologist shall be present at a pre-grading meeting(s), establish procedures for archeological resource monitoring during grading and construction, and establish, in conjunction with the City, procedures to temporarily halt or redirect all work to allow the sampling, identification, and evaluation of all resources as that are encountered by the archaeologist. If archeological features are discovered, the archeologist shall report such findings to the Ontario Planning Director. If the archeological resources are found to be significant, the archeologist shall determine the appropriate actions, in conjunction with the City, that shall be taken for exploration and/or salvage in compliance with CEQA standards.

CUL-2 If the find includes human remains, or remains that are potentially human, they shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the San Bernadino County Coroner (per § 7050.5 of the Health and Safety Code). The provisions of § 7050.5 of the California Health and Safety Code, § 5097.98 of the California Public Resources Code (PRC), and AB 2641 will be implemented. If the coroner determines the remains are Native American and not the result of a crime scene, the coroner will notify the Native American Heritage Commission (NAHC), which then will designate a Native American Most Likely Descendant

(MLD) for the Project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, the NAHC can mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

If you have any questions or would like to discuss these issues in further detail, please contact me at ssifuentes@ecorpconsulting.com or by phone at (909) 307-0046.

Sincerely,

Sonia Sifuentes
Southern California Cultural Resources Manager/Senior Archaeologist

REFERENCES

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_____. 2006d. California Department of Parks and Recreation (DPR) 532 form record for P-36-013424. On file at South Central Coastal Information Center at California State University, Fullerton.

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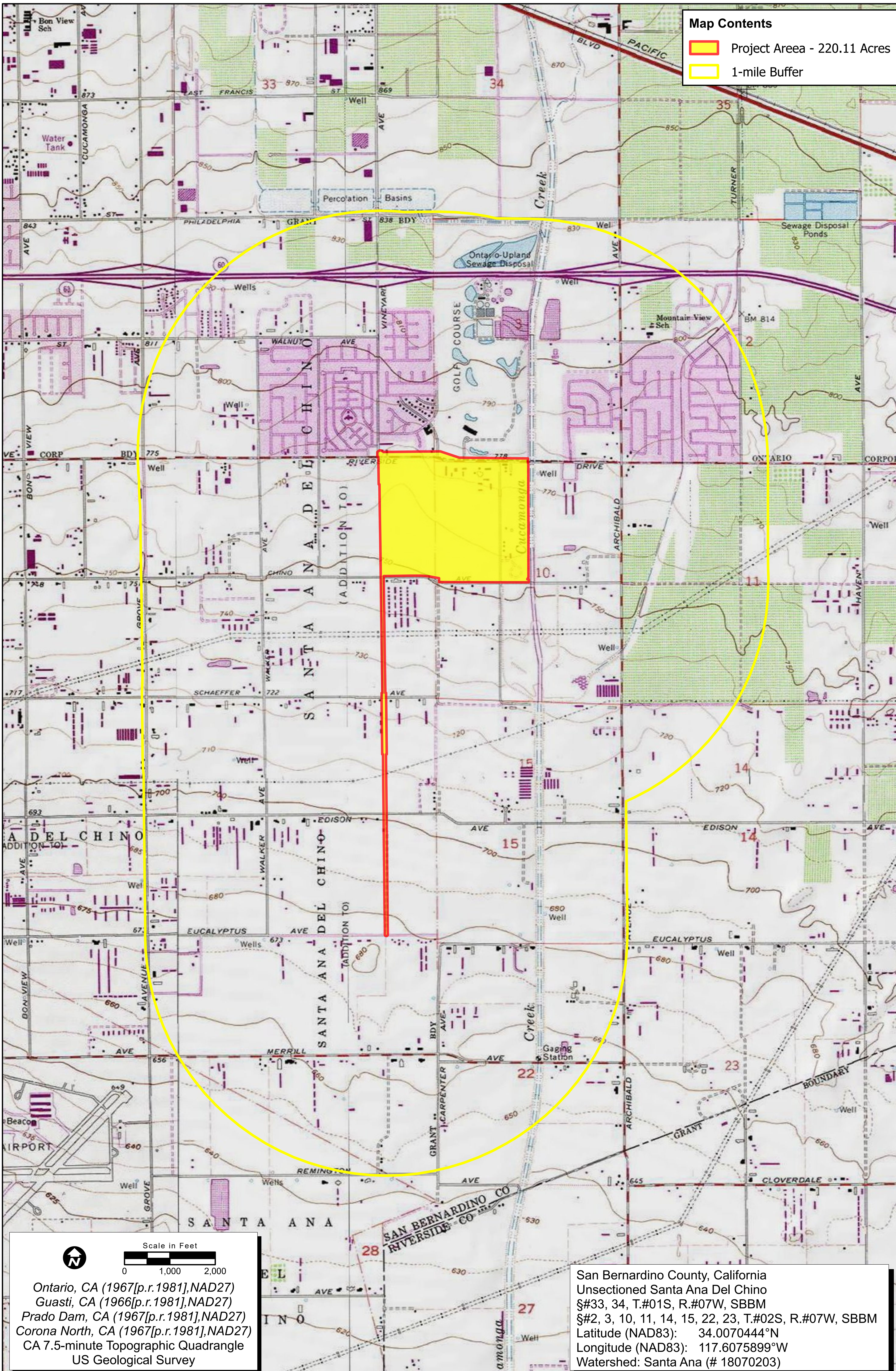
APPENDIX A

Records Search Confirmation



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Cultural_Resources\Cultural Resources.aprx - OBP_RS (trotellini - 10/4/2023)

Map Date: 10/4/2023
Sources: ESRI, USGS

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Records Search

2023-177 Ontario Ball Park

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-00253	NADB-R - 1060253; Voided - 75-4.3A	1975	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	ETHNOGRAPHIC AND ARCHAEOLOGICAL BACKGROUND	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00254	NADB-R - 1060254; Voided - 75-4.3B	1975	SUSS, TERRY D.	ARCHAEOLOGICAL IMPACT REPORT: RESOURCES EVALUATION OF CUCAMONGA CREEK AREA, REMINGTON AVENUE - CHINO - CORONA ROAD, U.S.G.S. CORONA NORTH, CALIF.	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00307	NADB-R - 1060307; Voided - 76-3.5	1976	HARRIS, RUTH D.	ARCHAEOLOGICAL - HISTORICAL ASSESSMENT, PROPOSED ANNEXATION TO THE CITY OF ONTARIO	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00317	NADB-R - 1060317; Voided - 76-4.2	1976	MARTZ, PATRICIA	DESCRIPTION AND EVALUATION OF THE CULTURAL RESOURCES: CUCAMONGA, DEMENS, DEER AND HILLSIDE CREEK CHANNELS, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA	ARCHAEOLOGICAL RESEARCH UNIT, UCR	36-000270, 36-000895, 36-000897, 36-000898, 36-000899, 36-000900, 36-000901, 36-000902, 36-015231
SB-00324	NADB-R - 1060324; Voided - 76-4.8	1976	HARRIS, RUTH D.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF AREA BOUNDED BY PHILADELPHIA STREET ON THE NORTH, BAKER AVENUE ON THE EAST, RIVERSIDE DRIVE ON THE SOUTH, AND SULTANA AVENUE ON THE WEST	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00385	NADB-R - 1060385; Voided - 76-9.3	1976	HEARN, JOSEPH E.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT: SEC. 4, T2S R7W, ONTARIO	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00596	NADB-R - 1060596; Voided - 78-1.3	1978	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF MERRILL AVENUE - FROM GROVE AVENUE TO ARCHIBALD AVENUE, CHINO AREA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00655	NADB-R - 1060655; Voided - 78-6.2	1978	COTTRELL, MARIE G.	REPORT OF ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCE ASSESSMENT CONDUCTED FOR A 900-ACRE PARCEL LOCATED IN THE SOUTHWEST OF ONTARIO IN SAN BERNARDINO COUNTY, CALIFORNIA	ARCHAEOLOGICAL RESOURCE MANAGEMENT CORPORATION	
SB-00800	NADB-R - 1060800; Voided - 79-6.7	1979	HEARN, JOSEPH E.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT FOR CHINO AVENUE/WALKER AVENUE TO CUCAMONGA CHANNEL	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-01112	NADB-R - 1061112; Voided - 81-4.2	1981	SMITH, GERALD A. and MICHAEL K. LERCH	CULTURAL RESOURCES ASSESSMENT OF TENTATIVE TRACT NO. 11917, YUCCA VALLEY, CALIFORNIA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-01298	NADB-R - 1061298; Voided - 82-8.4	1982	SCIENTIFIC RESOURCE SURVEYS, INC.	ARCHAEOLOGICAL/PALEONTOLOGICAL/HISTORICAL SURVEY REPORT ON THE TRACE ORGANICS DEMONSTRATION STUDY SITE LOCATED IN THE ONTARIO AREA OF SAN BERNARDINO COUNTY, CALIFORNIA	SCIENTIFIC RESOURCE SURVEYS, INC.	
SB-01496	NADB-R - 1061496; Voided - 85-7.1	1985	DEL CHARIO, KATHLEEN C. and MARIE COTTRELL	CULTURAL RESOURCE ASSESSMENT OF A 505-ACRE PARCEL NEAR ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA	ARCHAEOLOGICAL RESOURCES MANAGEMENT CORPORATION	
SB-01499	NADB-R - 1061499; Voided - 85-7.4A-B	1985	FOSTER, JOHN M. and ROBERTA S. GREENWOOD	CULTURAL RESOURCES OVERVIEW: CALIFORNIA PORTION, PROPOSED PACIFIC TEXAS PIPELINE PROJECT	GREENWOOD AND ASSOCIATES	
SB-01768	NADB-R - 1061768; Voided - 88-1.11	1988	LSA ASSOCIATES, INC.	A CULTURAL RESOURCE ASSESSMENT, CHINO AIRPORT EXPANSION PROJECT, SAN BERNARDINO COUNTY	LSA ASSOCIATES, INC.	
SB-03012	NADB-R - 1063012	1995	OWEN, SHELLEY MARIE	CULTURAL RESOURCES SURVEY AND IMPACT ASSESSMENT FOR THE CAJON/EPTC PIPELINE PROJECT LOCATED IN PORTIONS OF LOS ANGELES, SAN BERNARDINO, AND ORANGE COUNTIES, CA	EIP ASSOCIATES	36-005689, 36-005690, 36-005691, 36-008124, 36-008125
SB-03584	NADB-R - 1063584	1998	BRECHBIEL, BRANT	CULTURAL RESOURCE RECORDS SEARCH & LITERATURE REVIEW FOR A PBMS TELECOMMUNICATIONS FACILITY: CM 161-212, ONTARIO, CA. 4PP	LSA	
SB-03590	NADB-R - 1063590	1974	PEAK, ANN S.	ARCHAEOLOGICAL ASSESSMENT OF THE CHINO BASIN MUNICIPAL WATER DISTRICT'S REGIONAL PLANT ADDITION #1, SAN BERNARDINO COUNTY, CA. 16PP	PEAK & ASSOCIATES	
SB-04136	NADB-R - 1064136	2002	DAHDUL, MIRIAM	IDENTIFICATION & EVALUATION OF HISTORIC PROPERTY: PHILADELPHIA ST RECYCLED WATER PIPELINE, CITY OF ONTARIO, SAN BERNARDINO COUNTY, CA. 21PP	CRM TECH	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-04137	NADB-R - 1064137	2003	HOGAN, MICHAEL and BAI TANG	ADDENDUM OT HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY, PHILIADELPHIA ST RECYCLED WATER PIPELINE, CITY OF ONTARIO, SAN BERNARDINO COUNTY, CA. 13PP	CRM TECH	
SB-04142	NADB-R - 1064142	2002	TANG, BAI and JOSH SMALLWOOD	IDENTIFICATION & EVALUATION OF HISTORICAL PROPERTIES: RECYCLED WATER FACILITIES IMPROVEMENTS PROJECT, REGIONAL PLANTS NO. 1 & NO. 4, CITIES OF ONTARIO & RANCHO CUCAMONGA, SAN BERNARDINO COUNTY, CA. 26PP	CRM TECH	
SB-04150	NADB-R - 1064150	2002	BUDINGER, FRED E.	PROPOSED WIRELESS DEVICE MONOPINE & EQUIPMENT CABINET; WHISPER LAKE SITE, 2450 RIVERSIDE DR, ONTARIO, CA. 12PP	TETRA TECH, INC	
SB-04171	NADB-R - 1064171	2001	MAXWELL, PAMELA	CULTURAL RESOURCES EVALUATION: CUCAMONGA AND DEER CREEK CHANNELS ECOSYSTEM RESTORATION. 10PP	CORPS OF ENGINEERS	
SB-04174	NADB-R - 1064174	1998	HEKIMIAN, KENNETH K.	PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT FOR VACANT COMMERCIAL PROPERTY LOCATED AT THE NW CORNER OF S. ARCHIBALD AVE & E. RIVERSIDE DR, ONTARIO, CA. 12PP	HVN ENVIRONMENTAL SERVICE CO	
SB-04507	NADB-R - 1064507	2004	TIBBETT, CASEY	HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT: GRAND PARK SPECIFIC PLAN, CITY OF ONTARIO, SAN BERNARDINO COUNTY, CA. 16PP	CRM TECH	
SB-04675	NADB-R - 1064675	2006	ENCARNACION, DEIRDRE	HISTORICAL/ARHAEOLOGICAL RESOURCES SURVEY REPORT, PLANNING AREA 5, ARCHIBALD AVENUE AND CHINO AVENUE, CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA		
SB-04681	NADB-R - 1064681	2004	Aislin-Kay, Marnie	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate SB-575-03 (VV Dairy), 8571 Merrill Avenue, Chino, San Bernardino County, California.		

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-05358	NADB-R - 1065358	1976	Sider, W.A.	Cucamonga Creek 1776-1976 After 200 Years.		
SB-05424	NADB-R - 1065424	2006	Tang, Bai "Tom", Deirdre Encarnacion, Daniel Ballester, Josh Smallwood, and Terri Jacquemain	Historica/Archaeological Resources Survey Report: Planning Area 4, Riverside Drive and Walker Avenue, City of Ontario, San Bernardino County, California.	CRM Tech	36-013229, 36-013230, 36-013231, 36-013232, 36-013233, 36-013234, 36-013235, 36-013236, 36-013237, 36-013238, 36-013239, 36-013240, 36-013241, 36-013242, 36-013243, 36-013244
SB-05476	NADB-R - 1065476	2007	Bonner, Wayne H. and Marnie Aislin-Kay	Cultural Resource Records Search Results and Site Visit for T-Mobile Candidate IE04935A (SCE Chino Mira Loma M226-T6), Chino Avenue and Old Archibald Ranch Road, Ontario, San Bernardino County, California	Michael Brandman Associates	
SB-05478	NADB-R - 1065478	2006	Bonner, Wayne H. and Sarah A. Williams	Cultural Resource Records Search Results and Site Visit for Royal Street Communications, LLC Telecommunications Facility Candidate LA0723D (Westwind Park), 2425 East Riverside Drive, Ontario, San Bernardino County, California	Michael brandman Associates	
SB-05700	NADB-R - 1065700	2006	Hogan, Michael and Bai “Tom” Tang	On-Call Archaeological Monitoring Services: Eastern Trunk Sewer/Kimball Interceptor Sewer, Cities of Ontario and Chino, San Bernardino County, California.	CRM TECH	36-012533
SB-05701	NADB-R - 1065701; Paleo -	2006	Wetherbee, Matthew and Sarah Siren	A Phase I Cultural Resources Inventory and a Paleontological Assessment for the 111-Acre Avenue Specific Plan Project, City of Ontario, San Bernardino County, California.	Stantec Consulting Inc.	
SB-05702	NADB-R - 1065702	2007	Encarnacion, Deirdre and Daniel Ballester	Identification and Evaluation of Historic Properties: RP-1 Outfall Parallel Pipeline Project, City of Ontario, San Bernardino County, California.		
SB-05729	NADB-R - 1065729	2004	Gordon, Beth	CA8118/SCE Grove, 13524 South Grove Ave, Ontario, San Bernardino County, California 91761.	RESCOM Environmental Corp	
SB-05787	NADB-R - 1065787	2006	Sanka, Jennifer	Phase I Cultural Resources Assessment Paleontological Records Review Merrill Avenue Project: Albers and Van Vliet Dairy Farms, Chino, San Bernardino County, California.		

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-05976	NADB-R - 1065976	2007	Wetherbee, Matthew, Sarah Siren and Gavin Archer	Cultural Resource Assessment New Model Colony East Backbone Infrastructure, City of Ontario, San Bernardino County, California.	Stantec	36-012533
SB-06095	NADB-R - 1066095	2009	Applied Earthworks	Confidential Cultural Resources Specialist Report for the Tehachapi Renewal Transmission Project.	Applied Earthworks	36-003690, 36-019845, 36-019846, 36-019847, 36-019848
SB-06665	NADB-R - 1066665	2009	Hogan, Michael, Deirdre Encarnacion, Harry M. Quinn, Daniel Ballester, and Laura Hensley Shaker	Identification and Evaluation of Historic Properties: 930 Zone Recycled Water Project, Cities of Chino Hills, Chino and Ontario, San Bernardino County, California.	CRM Tech	
SB-06928	NADB-R - 1066928	2010	Wlodarski, Robert J.	A Record Search and Field Reconnaissance Phase for the Proposed AT&T Wireless Telecommunications Site ES0342 (Anker Property) Located at 13524 Grove Avenue, Ontario, California 91761.	CARE	36-024866
SB-07956		2007	Doolittle, Christopher J.	Archaeological Survey report for Southern California Edison's G.O. 131-D Assessment of the Chino A-Bank System and System Split Project San Bernadino County, California	Eath Tech, Inc.	
SB-07968		2011	Holm, Lisa and John Holson	Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segement 8 East (Phases 2 and 3) and West (Phase 4), Los Angeles and San Bernardino Counties, California	Pacific Legacy, Inc.	36-012533, 36-012621, 36-012622
SB-07977		2010	Panich, Lee, Tsim D. Schneider, and John Holson	Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 and 3), San Bernardino County California	Pacific Legacy, Inc.	36-013330, 36-013636
SB-08257		2016	Tang, Bai	Due-Diligence Historical/Archaeological Resources Study Inland Empire Utilities Agency Recharge Basin Maintenance Plan Chino Basin Area, San Bernardino and Riverside Counties, California CRM TECH Contract No. 2989	CRM TECH	

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-36-012195		Resource Name - SA CHUL Farms	Building, Structure	Historic	AH05; HP02; HP33; HP39	2005 (P. Daly, Chambers Group, Inc)	
P-36-012533			Site	Historic	AH07	2005 (Robert Porter, CRM Tech)	SB-05700, SB-05976, SB-07968
P-36-013229		Resource Name - CRM Tech 1790-1	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013230		Resource Name - CRM Tech 1790-2	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013231		Resource Name - CRM Tech 1790-3	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013232		Resource Name - CRM Tech 1790-4	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013233		Resource Name - CRM Tech 1790-5	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013234		Resource Name - CRM Tech 1790-6	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013235		Resource Name - CRM Tech 1790-7	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013236		Resource Name - CRM Tech 1790-8	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013237		Resource Name - CRM Tech 1790-9	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013238		Resource Name - CRM Tech 1790-10	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013239		Resource Name - CRM Tech 1790-11	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013240		Resource Name - CRM Tech 1790-12	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013241		Resource Name - CRM Tech 1790-13	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013242		Resource Name - CRM Tech 1790-14	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013243		Resource Name - CRM Tech 1790-15	Building	Historic	HP02	2006 (Josh Smallwood, CRM Tech)	SB-05424
P-36-013244		Resource Name - CRM Tech 1790-16	Building	Historic	HP02	2006 (Josh Smallwood, CRM TECH)	SB-05424

Resource List

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-36-023548		Resource Name - Van Vilet Dairy	Building	Historic	HP33	2011 (Michael Dice, MBA)	
P-36-024866							SB-06928
P-36-025440		Resource Name - Chino-Mira Loma No. 1 Transmission Line	Structure	Historic	HP11	2010 (Wendy Tinsley Becker, Urbana Preservation & Planning)	SB-06037
P-36-026051		Resource Name - Devers-San Bernardino 220kV; Other - P-33-015035; Resource Name - SCE Hayfield-Chino 220kV Transmission Line; Other - Julian Hinds-Mirage 220kV, Devers-Mirage 220 kV, Devers-San Bernardino No. 1 220kV; Other - Mira Loma-Vista 220 kV, and Chino Mira Loma No. 3 220 kV Transmission Lines; Voided - 36-027693	Structure	Historic	HP11	2012 (Davidson, et al., LSA Associates, Inc.); 2013 (Wendy Tinsley/Steven Treffers, Urbana Preservation/SWCA); 2014 (Daniel Ballester, CRM Tech); 2018 (Robert Cunningham, ECORP); 2019 (Riordan Goodwin, LSA)	SB-07946, SB-07955, SB-08426
P-36-033019	CA-SBR-033019H	Resource Name - Merrill Commerce Center Temp-1	Site	Historic	AH04	2019 (Jennifer Stropes, BFSA)	
P-36-033020		Resource Name - Merrill Commerce Center Iso-1	Other	Prehistoric	AP02	2019 (Jennifer Stropes, BFSA)	

APPENDIX B

Updated Site Records

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code Reviewer Date

 ***Resource Name or #:** N/A

P1. Other Identifier: Orange Blossom and Ellsworth Ranch
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Riverside
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Ontario **Date:** 1952 **T**2S; **R**7W; Section 10 S.B.**B.M.**
c. Address: 9381 E. Riverside Drive City: Ontario Zip: 91761
d. UTM: 11S 447280 mE 3764416 mN
e. Other Locational Data:

***P3a. Description:**

The 80-acre property at 9381 E. Riverside Drive contains dwellings and farm structures on the north end of the property and long, linear cattle corrals spanning the southern two-thirds of the property. Three dwellings on this property were previously recorded: P-36-13241, P-36-13242, and P-36-13243. An L-shaped gravel driveway leads to the center of the cluster of buildings at the north end of the property. **See Continuation Sheet.**

***P3b. Resource Attributes:** HP33. Farm/ranch

***P4. Resources Present:** ☒ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing

P5b. Description of Photo:
Overview of property
View south, December 13, 2023

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
c. 1948 (topographic maps)

***P7. Owner and Address:**
City of Ontario
303 E. B Street
Ontario, CA, 91761

***P8. Recorded by:**
Andrew Bursan
ECORP Consulting, Inc.
2861 Pullman Street
Santa Ana, CA 92705

***P9. Date Recorded:**
December 7, 2023

***P10. Survey Type:**
Intensive

***P11. Report Citation:**
ECORP Consulting, Inc. 2023. Architectural History Inventory Report for the Orchard View Apartments Project, Butte County, California. Prepared for Pacific West Communities

***Attachments:** ☐ NONE ☒ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #**

B1. Historic Name: Ellsworth/Orange Blossom Ranch
B2. Common Name: 9381 E. Riverside Drive
B3. Original Use: Cattle farm
B4. Present Use: Dairy

***B5. Architectural Style:** Ranch

***B6. Construction History:**
No original permits were located
2010: Permit #B201000506 for an above ground water tank system for $10,000
2010: Permit #B201000508 for an above ground water tank system for $14,000

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A

***B8. Related Features:** N/A

B9a. Architect: N/A
b. Builder: N/A

***B10. Significance: Theme:** Agricultural **Area:** Ontario
Period of Significance: 1948 **Property Type:** Ranch **Applicable Criteria:** N/A

The following Significance Statement provides historic contexts to support an evaluation of 9381 E. Riverside Drive using National Register of Historic Places (NRHP), California Register of Historic Resources (CRHR), and City of Corona Landmark criteria. (See continuation sheet)

B11. Additional Resource Attributes: N/A

***B12. References:**

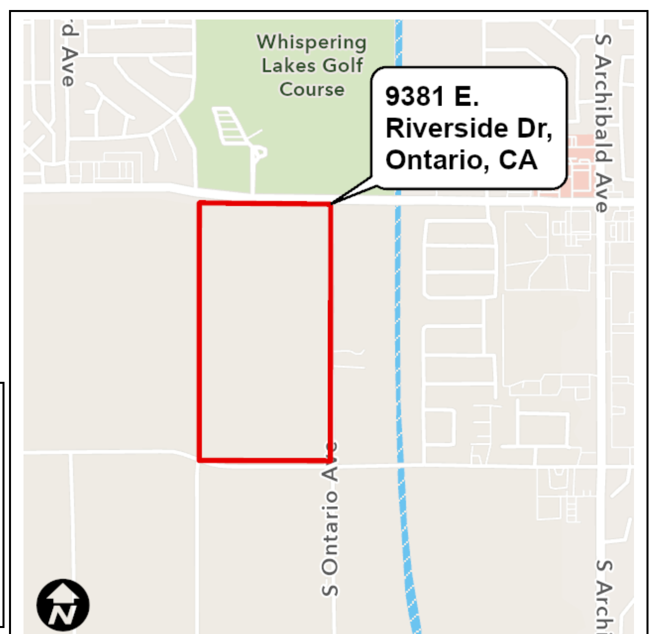
(See continuation sheet)

B13. Remarks: None

***B14. Evaluator:**
Andrew Bursan
ECORP Consulting, Inc.
2861 Pullman Street
Santa Ana, CA 92705

***Date of Evaluation:** December 20, 2023

(This space reserved for official comments.)



***P3a. Description (continued):**
At the far northeast end of the property is a circa 1947 one-story, single-family, Ranch-style dwelling (Resource P-36-13242) topped by a side gabled roof with slightly overhanging eaves (Figure 2). The rectangular shaped house features rough textured stucco and a chimney centered on the front façade. Besides one aluminum slider window on the front elevation, all window treatments and doors have been removed, leaving only window and door openings or window openings boarded with plywood.

Just to the west sits a circa 1966 one-story, single-family, Ranch-style dwelling (Resource P-36-13241) topped by a cross gabled roof with rounded bargeboards on the projecting front gabled eastern section of the house (Figure 3). L-shaped in plan, the house features non-original rough textured stucco which is punctuated by non-original vinyl frame windows on all elevations. A flat panel wood door highlights the west end of the front façade and serves as the primary entrance.

Further to the south is a small circa 1955 one-story, single-family, Ranch-style house surmounted by a side gabled roof with a projecting wing on the east elevation topped by a front gabled roof. The house sits on a T-shaped plan with rough textured stucco cladding exterior elevation and vinyl frame windows interspersed on all sides of the dwelling (Figure 4).

This dwelling is flanked to the south by a circa 1948 one-story, single-family, Ranch-style house (Resource P-36-13243) on an L-shaped plan (Figure 5). A side gabled roof tops the house and features three decorative dovecote vents along the peak. Non-original rough textured stucco clads exterior surfaces and fenestration consists of non-original vinyl frame windows on all sides. Two wood frame doors on the east end of the south elevation provide the primary entrance along with three garage door openings on the same façade. Decorative vents punctuate gable faces.

At the very south end of the building cluster sit two circa 1948 farm storage buildings and 12 canopy structures built in the 1980s (Figure 6). The northernmost farm storage building features a front gabled corrugated metal roof, rough textured stucco cladding, and a rectangular plan. A sliding wood door serves as the primary entrance to the western façade. The building has limited fenestration and an exposed southern elevation.

The other circa 1948 farm storage building to the south is of corrugated metal construction and topped by a front gabled roof. Exposed sections of the building on the east and south elevations provide entrance to the building.

The property's northwestern corner contains a circa 1978 Ranch-style dwelling and dairy barn structure (Figures 7 and 8). The one-story Ranch-style dwelling features a side gabled roof, a rectangular plan, and rough textured stucco cladding with brick trim. Fenestration consists of aluminum slider windows on all sides. A centered and projecting front gabled section of the roof shelters a wood frame door which provides the primary entrance to the house that is by a brick chimney. Just to the west is a two-story, front gabled dairy barn on a rectangular plan. Window treatments consist of three aluminum slider windows on the primary north elevation. Two flat panel wood doors act as entrance ways on the primary façade and the west elevation contains three freight entrances with metal roll-up doors. Four brick pilasters on the primary façade distinguish the building.

Flanking the two farm storage buildings, to the east and west, are two hay canopy shelters with corrugated metal shed roofs supported by square wood posts. The remainer of the property to the south consists of six new linear cattle feeding trough canopy shelters spanning the southern end of the property ranging from roughly 1,000 feet to 450 feet in length. No new buildings or structures have been added to the property since 1994. Vegetation on the property consists of a grass lawn that sounds the dwelling on the north end of the property and one pine along the north property line.

B10. Significance (continued):

Historic Context

City of Ontario
In 1881, George Chaffey created the Etiwanda Irrigation community and used a series of flumes from the nearby mountains to irrigate the town then known as Etiwanda. By 1882, he had expanded his business to cover other areas of the former Rancho Cucamonga land grant including the planned community Ontario, named after his homeland in Canada (Upland Heritage 2021).

In 1887, the Atchison Topeka and Santa Fe Railroad passed through Ontario and Upland and the Upland railway station was subsequently constructed by the Bedford brothers. Due to the new train line that made it easier for locals to go to jobs outside the neighborhood, the area saw rapid growth and the construction of both residential and commercial properties. (Upland Heritage 2021). On December 10, 1891 the City of Ontario was incorporated as a city of 0.38 acre (City of Ontario n.d.a.).

The Chaffey brothers founded and constructed Chaffey College, a University of Southern California affiliate school, at 1245 Euclid Avenue in Ontario in 1901. From 1901 to 1960, it taught both high school and college courses. The Federal Works Project Administration replaced the original Chaffey College buildings in the 1930s. Chaffey College relocated to Rancho Cucamonga in 1960, and the original structure became Chaffey High School. (City of Ontario n.d.b).

In 1903, an act of Congress declared Ontario a "Model Irrigation Colony," noting innovations in standards of urban living, and served as an example of a successful irrigation project. The concrete irrigation systems and municipal water systems installed by the Chaffey brothers inspired nearby communities to follow suit (City of Ontario n.d.a).

Construction began on Pikes Peak Ocean to Ocean Highway through Ontario in 1912. As automobiles became more popular, and the Pikes Peak route became more complete in the 1920s, property owners along Holt Boulevard began to cater increasingly to motorists. Many residences were partly or fully converted into drive-up restaurants and farmers built roadside shacks to sell produce (City of Ontario n.d.c).

In 1923, taking advantage of some flat, unused crop land, businessmen Waldo Waterman and Achie Mitchell established Latimer Field. After being forced to relocate their aviation hobby multiple times, Mitchell and Waterman eventually settled at what is now Ontario World Airport. The airport served as a vital training ground for pilots during World War II (WWII; City of Ontario n.d.a).

In 1996, thanks to potential customers from the airport, as well as the 10, 60, and 15 freeways, Ontario developed what at the time was the largest single-story shopping mall in the world and the largest shopping center of any kind in California, the 131-acre Ontario Mills Mall. The Ontario Mills Mall developers intended it to meld amusement park and shopping mall elements to attract more consumers than either could alone. The AMC theater that opened at the mall featured 30 screens and was the one of biggest theaters in the world at the time of its completion (White 1996).

Today Ontario has an estimated population of approximately 179,000 people. The three main industries in Ontario are retail sales, transportation, warehousing, and health care. The population averages 3,507 people per square mile in Ontario (U.S. Census Bureau 2023).

<u>California Ranch Properties</u>
"For the last hundred years," writes geographer Paul F. Starrs, "the fundamental unit of a livestock operation in the western United States has been the home ranch" (Starrs 1998). In California, the home ranch traces its roots to no-fence laws of the 1870s. No-fence laws shifted the burden of fence building from farmers to ranchers, signaling the end of free-range grazing as practiced on California's Mexican-era ranchos (Jelinek 1982). Whereas ranchers had previously grazed their animals on California grasses with no regard for property boundaries, after 1870 they began acquiring their own private ranges enclosed within fences. The entire operation, called a home ranch, included family residences and outbuildings.

Unlike fruit orchards and other types of intensive agriculture where farmers supported families on 5, 10, or 20 acres by producing high-value farmed goods, ranching required vast acreage to raise cattle and sheep. "The term home ranch," writes Starrs, "asserts viability, a size and substance sufficient to claim permanence and self-reliance" (Starrs 1998) It represented extensive agriculture, where supporting a family might require 160 acres or more. Home ranches were characterized by vast open spaces where herds roamed and grazed. If well located, they possessed flowing streams or groundwater wells for watering stock and irrigating fields planted in alfalfa or other forage crops. Spatially, home ranches were also characterized by flexibility: a rancher could add adjoining acreage to increase the size of a ranch or sell off portions when cash was needed.

The nucleus of the home ranch was the headquarters, typically set upon high ground and fronting a rural county road. The headquarters contained the main house for the ranching family. Architecturally, the main houses built on home ranches through the first half of the 20th century differed little from houses built in town. They ranged from modest Minimal Traditional-style dwellings and prototypical Ranch-style houses to elaborate revival-style residences (Packard 1995). Around the main house stood a cluster of buildings, structures, and landscape features that supported ranching activities. These included barns, corrals, housing for ranch hands, stables for horses, shade trees, water towers, windmills, repair shops, and storage sheds for miscellaneous supplies (Starrs 1998). Silos and chicken coops were also common features of home ranches (Packard 1995). Many western ranches, particularly those in mountain states, had special enclosures for livestock and poultry, but benign winter weather in California made "light and cheap shelter" sufficient. "It is, in fact, frequently dispensed with altogether" noted an observer of 1920s California ranches (Wickson 1923).

Ranch Style (1930-1975)

All dwellings at 9381 E. Riverside Drive are Ranch-style houses. Ranch-style houses in California reflect a national trend of fascination with the "Old West" and were a building style of choice for tract housing. Ranch homes were originally developed in the western and southwestern U.S., but quickly gained national popularity through the dissemination of do-it-yourself manuals and plans in national magazines such as Sunset, Better Homes and Gardens, and House Beautiful. Later, ranch houses were popular as a custom-built type of housing, which was especially popular in the late 1940s and 1950s. Ranch houses were typically built between 1930 and 1975, but peaked in the 1950s, as the most prevalent type of post-WWII suburban tract-style housing, often housing veterans who secured housing with Federal Housing Authority loans.

Ranch style houses are usually a one-story, single-family residence. Houses designed in this architectural style include several identifying characteristics such as rambling, elongated plans; a horizontal emphasis; general asymmetry; free-flowing interior spaces; and a designed connection to the outdoors. Features such as low-pitched roofs with wide eaves, a combination of cladding materials including board-and-batten siding, brick and stone chimneys, and large picture windows were commonly applied and evoked an aesthetic that was reminiscent of these past architectural traditions. Decorative features such as wood shutters and dovecotes were often added to enhance the rusticated appearance of Ranch houses (Grimes and Chiang 2009; Horak et al. 2015; McAlester 2013).

Character-defining features include:

- rambling, elongated plans with a horizontal emphasis;
- one to two stories in height;
- low-pitched gabled or hipped roofs with overhanging, open eaves;
- general asymmetry;
- free-flowing interior spaces;
- designed connection to the outdoors;
- cladding featuring stucco, board and batten, shingles, clapboard, or a combination of materials;
- brick or stone chimneys details;
- attached garages often linked to residence by breezeways;
- stone, brick, board and batten, clapboard, or horizontal wood siding used for accent on walls, secondary cladding types, and planters;
- functional and non-functional shutters details as trim around windows; and
- fenestration may include a picture window.

Development History of 9381 E. Riverside Drive

The 80-acre property at 9381 E. Riverside Drive first appears in a 1938 aerial image that depicts the property as having about 7 acres of planted trees in a rectangular formation near E. Riverside Drive on the northeast corner of the property. During this period, no buildings appear on the property and besides the 7-acre tree grove, the rest of the parcel looks fallow (NETR 2023).

By the time of the next aerial image in 1948, seven buildings including two single-family dwellings and five ancillary ranch buildings are seen clustered on the northeast corner of the property, replacing a portion of the former tree grove. The remaining portion of the property contains three large square corrals each ranging in size from 20 to 30 acres (NETR 2023).

By the late 1970s, the property had much of the same configuration as the 1940s but with the addition of two rectangular Ranch-style dwellings including a street facing 20-foot by 90-foot house and a 20-foot by 50-foot single-family dwelling at the center of the building cluster on the northeast corner of the property (NETR 2023).

After the property converted to a dairy in the late 1970s, four new buildings appear on the property including a street-facing circa 1978 Ranch-style house near the centered main entrance to the property. The dwelling is flanked to the west by a circa 1978 dairy barn-style building. By 1985 two hay storage canopies were at the center of the property. In 1994, six new linear cattle feeding trough canopies span the southern end of the property ranging from 450 feet to 1,000 feet in length. The property owners have not added new buildings or structures to the property since 1994 (NETR 2023).

<u>Ownership History</u>

Research shows the property having been used for agricultural purposes since the 1930s. In the early 1940s, Major C.C. Moseley operated the property briefly as a cattle ranch and later sold it in 1945 to restaurant chain owner W. “Tiny” Naylor in 1945. The property again sold to Rex Ellsworth in 1947 who operated it as an 80-acre thoroughbred racehorse breeding farm. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby horse Swaps, Ellsworth’s main horse breeding and training operations were 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate Swaps and subsequent winning horses trained by Ellsworth with the Chino location, which he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. The subject property most likely acted as an ancillary facility to their main operation in Chino which was about 220 acres larger. The De Boer family purchased the property in the late 1970s and have operated a dairy on the property to the present day (San Bernardino County Sun 1947; The Mirror 1953; Chino Champion 1975).

<u>Evaluation</u>

The property at 9381 E. Riverside Drive (Resources P-36-13241, P-36-13242, and P-36-13243) does not meet any of the criteria for listing in the NRHP, CRHR, or as a City of Ontario Historic Landmark individually or as part of an existing historic district, as demonstrated below.

NRHP/CRHR Criterion A/1

Research shows the property at 9381 E. Riverside Drive as having been used for agricultural purposes since the 1930s. It later operated as a cattle ranch, thoroughbred racehorse breeding ranch, and finally as a dairy. While the property shares a history with thoroughbred horseracing, horse breeder Rex Ellsworth only used the property as his main headquarters from 1947 to 1953 before he achieved greater success after moving his headquarters to a Chino property 7 miles to the west. Evidence did not suggest that other uses of the property, including a cattle ranch and later a dairy started in the late 1970s, played an important role in events of the past. Both cattle ranches and dairies stand as common-place agricultural activities for the area and no information was located indicating that the property is associated with important innovations in ranching or dairy production. Research found no association with more specific events or patterns of development that have historical significance at the local, state, or national level. For these reasons, ECORP found 9381 E. Riverside Drive not eligible for the NRHP/CRHR under Criterion A/1.

NRHP/CRHR Criterion B/2

Previous owners of the 9381 E. Riverside Drive property include C.C. Moseley, who operated the property briefly as a cattle ranch, restaurant chain owner W. “Tiny” Naylor, and Rex Ellsworth, who operated it as an 80-acre thoroughbred racehorse breeding farm starting in 1947. The De Boer family has operated a dairy on the property since the late 1970s. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby winning horse Swaps, Ellsworth’s main horse breeding and training operation was 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate the racehorse Swaps and subsequent winning horses trained by Ellsworth with the Chino location, which he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. In addition, research found no indication that other property owners, besides Ellsworth, made a significant contribution to local history. There is no information in the archival record to suggest that the 9381 E. Riverside Drive is associated with the lives of persons significant in our past and ECORP found the property not eligible for the NRHP/CRHR under Criterion B/2.

NRHP/CRHR Criterion C/3

9381 E. Riverside Drive represents a typical example of an agricultural property with Ranch-style dwellings and similar properties can be found throughout southwest San Bernardino County to the present day. The Ranch style dwellings on the property lack features found in better examples of the style such as board-and-batten siding, diamond pane windows, x-bracing, and more rambling plans. Research found no evidence that any of the dwellings on the property are the work of a master. Ancillary farm storage buildings and corrals have utilitarian designs and few distinguishable architectural characteristics. No building on the property embodies the distinctive characteristics of a type, period, or method of construction, or represents a significant and distinguishable entity whose components may lack individual distinction. Therefore, ECORP found 9381 E Riverside Drive not eligible for the NRHP/CRHR under Criterion C/3.

NRHP/CRHR Criterion D/4

The information potential of 9381 E. Riverside Drive is expressed in its built form and in the historical record. It has not yielded, nor is it likely to yield, information important in history or prehistory. ECORP found 9381 E. Riverside Drive not eligible for the NRHP/CRHR under Criterion D/4.

Integrity

9381 E. Riverside Drive maintains integrity of setting because the buildings on the property have not been relocated. The De Boer Dairy has operated the property since the late 1970s and completely reconfigured the corrals on the property and added a few new canopy shelters and two farm storage buildings. Dairy operation changes since the 1970s have dramatically changed the relationship between buildings and general farm operation from the 1947 period of significance. Due to this drastic change of use and physical layout, the property no longer retains integrity of setting, feeling, and association. The oldest buildings on the property are Ranch-style dwellings built from roughly 1947 to the 1960s. These dwellings have all undergone significant alterations including the replacement of original windows with vinyl frame windows, the replacement of original doors, cladding in non-original stucco, and building additions. The alterations have removed what few character-defining features the dwellings had. In addition, the two ancillary farm buildings have replacement cladding and altered entranceways. Therefore, the property lacks integrity of design, materials, and workmanship. Regardless of integrity, due to lack of historical significance, 9381 E. Riverside Drive does not meet NRHP or CRHR eligibility criteria as an individual resource or as part of any known or suspected historic district; the resource is not listed on any Certified Local Government historic property register.

City of Ontario Historic Landmark Designation

An individual City of Ontario Historic Landmark must meet the following criteria contained in the Ontario Development Code Section 4.02.050 on its own merit:

1. It meets the criteria for listing in the National Register of Historic Places or

Per the significance evaluation above, ECORP found the property not eligible for the NRHP under any criterion.

2. It meets the criteria for listing in the California Register of Historic Resources or

Per the significance evaluation above, ECORP found the property not eligible for the CRHR under any criterion.

3. It meets one or more of the following criteria:

A. **It exemplifies or reflects special elements of the City's history**
The property exhibits a history typical of agricultural properties in the area and does not have special elements of the City's history.

B. **It is identified with persons or events significant in local, state, or national history**
Previous owners of 9381 E. Riverside Drive include C.C. Moseley, who operated the property briefly as a cattle ranch, restaurant chain owner W. "Tiny" Naylor, and Rex Ellsworth, who operated it as an 80-acre thoroughbred racehorse breeding farm starting in 1947. The De Boer family has operated a dairy on the property since the late 1970s. Although Rex Ellsworth had a decorated career as a thoroughbred breeder and was the owner of the 1955 Kentucky Derby horse Swaps, Ellsworth's main horse breeding and training operation was 7 miles to the west in Chino, near the intersection of Schaefer Avenue and Pipeline Avenue. Newspaper articles associate the racehorse Swaps and subsequent winning horses trained by Ellsworth with the Chino location that he purchased in 1953 (officially listed 3985 Schaefer Avenue) with no mention of these horses training at the subject 9381 E. Riverside Drive location after 1953. There is no information in the archival record to suggest that 9381 E. Riverside Drive is associated with the lives of people significant in local, state, or national history.

C. It is representative of the work of a notable builder, designer, architect, or artist
Research found no evidence that 9381 E. Riverside Drive represents the work of a notable builder, designer, architect, or artist. Therefore, ECORP finds the property not eligible for association with notable builders, designers, architects, or artists.

D. It embodies distinguishing architectural characteristics of a style, type, period or method of construction
9381 E. Riverside Drive represents a typical example of an agricultural property with Ranch-style dwellings and similar properties can be found throughout southwest San Bernardino County to the present day. Ranch-style dwellings on the property lack the character-defining elements of the style such as board-and-batten siding, diamond pane windows, x-bracing, and more rambling plans. Ancillary farm storage buildings and corrals have utilitarian designs and few distinguishable architectural characteristics. Therefore, ECORP finds the property not eligible for embodying a distinguished architectural characteristic of a style, type, period, or method of construction.

E. It is noteworthy example of the use of indigenous materials or craftsmanship
The property at 9381 E. Riverside Drive contains Ranch-style dwellings and utilitarian farm buildings all built after WWII. They represent typical building types and construction methods of the era and ECORP finds the property not eligible for association with indigenous materials or craftsmanship.

F. It embodies elements that represent a significant structural, engineering, or architectural achievement or innovation
The property at 9381 E. Riverside Drive contains Ranch-style dwellings and utilitarian farm buildings all built after WW II. The current dairy operation has arranged corrals and farm-related elements much like other dairies in the area. Therefore, ECORP finds the property not eligible for representing a significant structural, engineering, or architectural achievement or innovation.

G. It has a unique location, a singular physical characteristic, or is an established and familiar visual feature of a neighborhood, community of the City
The property at 9381 E Riverside Drive is in an agricultural area on the southern end of the City of Ontario among many properties of a similar type and configuration. Therefore, ECORP finds the property not eligible as it does not represent a unique location, a singular physical characteristic, and is not an established and familiar visual feature of a neighborhood or community of the City.

H. It is one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen
Ontario and southwestern San Bernardino County contain several dairy and agricultural operations similar to the property at 9381 E. Riverside Drive. Therefore, ECORP finds the property not eligible as one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen.

B12. References (continued):

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***Resource Name or #:** N/A

***Recorded by:** Andrew Bursan ***Date:** 12/20/2023 ☒ **Continuation** ☐ **Update**

White, George. October 30, 1996. 12 AM PT. Los Angeles Times. “Retailing has lagged population growth in the Inland Empire. Now officials are hoping a 131-acre outlet mall will kick start it as…: the Empire Strikes Back” https://www.latimes.com/archives/la-xpm-1996-10-30-fi-59175-story.html. Accessed October 11, 2023.

White, Robert S. 2016a. Cultural Resources Records Search Update and Summary for the Armstrong Ranch Specific Plan, 199-acres Located Southeast of the Intersection of Vineyard Avenue and East Riverside Drive, City of Ontario, San Bernardino County.

_____. 2016b. Phase II Historical and Architectural Significance Evaluations for Six Properties within the Armstrong Ranch Specific Plan, 199 Acres Located Southeast of the Intersection of Vineyard Avenue and East Riverside Drive, City of Ontario, San Bernardino County.

Figure 2. Southern façade (view northwest; December 13, 2023).

Figure 3. Northern façade (view southeast; December 13, 2023).

Figure 4. Eastern façade (view west; December 13, 2023).

Figure 5. Western and Southern façades (view southwest; December 13, 2023).

Figure 6. Eastern façade (view southwest; December 13, 2023).

Figure 7. Northern façade (view south; December 13, 2023).

Figure 8. Northern façade (view southeast; December 13, 2023).

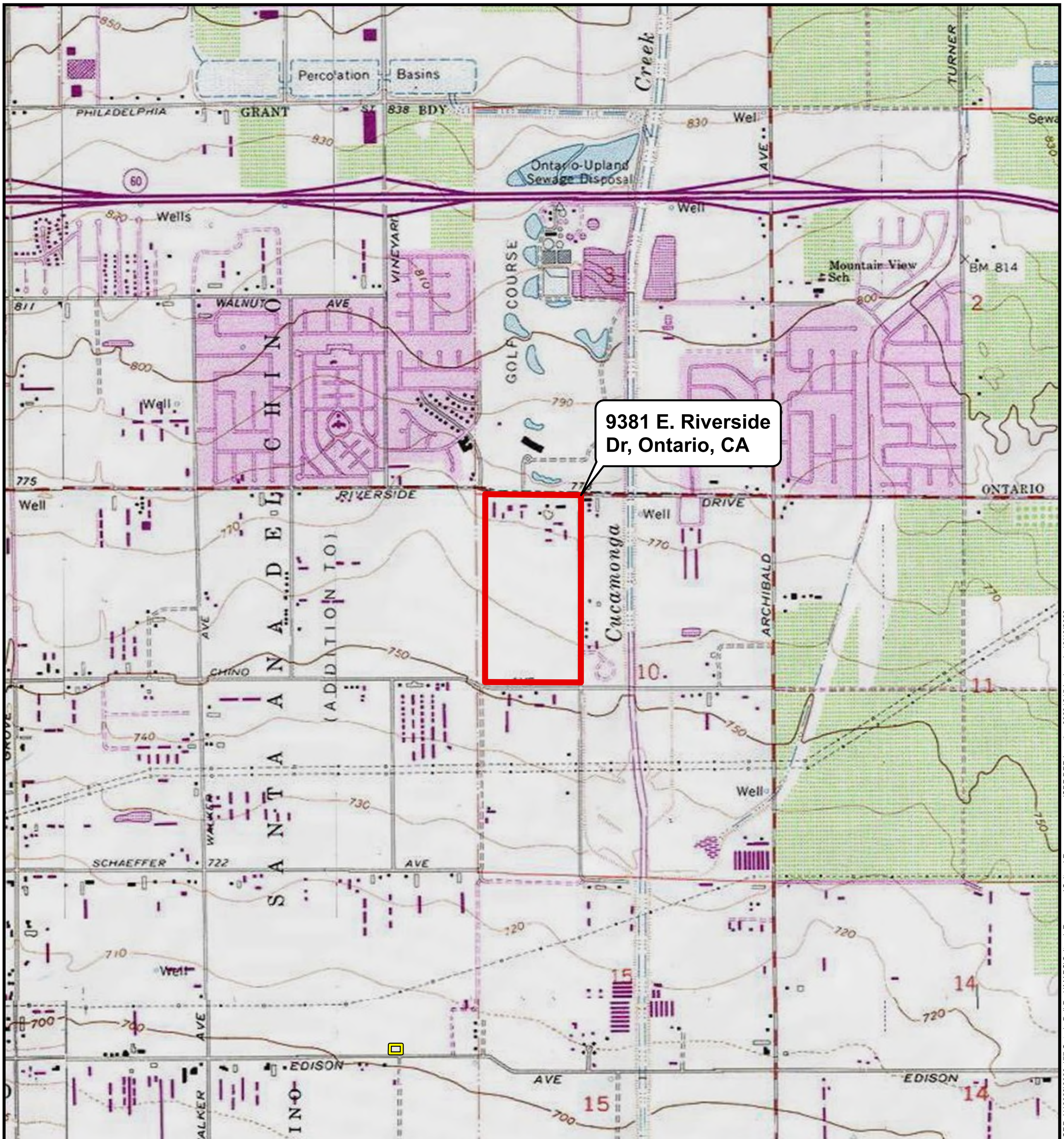
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

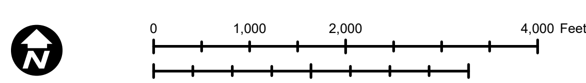
Primary #
HRI #
Trinomial

 ***Resource Name or #:** 9381 E. Riverside Dr, Ontario, CA

***Map Name:** Guasti, CA ***Scale:** 1:24,000 ***Date of Map:** 1966 (p.r. 1981)



DPR 523J (1/95) ***Required Information**



Appendix F2 2016 Cultural Resources Report

Appendices

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EXECUTIVE SUMMARY

PHASE II HISTORICAL AND ARCHITECTURAL SIGNIFICANCE EVALUATIONS FOR SIX PROPERTIES WITHIN THE ARMSTRONG RANCH SPECIFIC PLAN, 199-ACRES LOCATED SOUTHEAST OF THE INTERSECTION OF VINEYARD AVENUE AND EAST RIVERSIDE DRIVE, CITY OF ONTARIO, SAN BERNARDINO COUNTY

by:

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Prepared for:

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Section 10 (partially projected), Township 2 South, Range 7 West, SBBM

Guasti 7.5' USGS Topographic Quadrangle

FINAL
September 27, 2016

KEYWORDS: Phase II Summary, City of Ontario, San Bernardino County

The undersigned certifies that the attached report is a true and accurate description of the results of a CULTURAL RESOURCES UPDATE described herein.

....
Robert S. White
Principal Investigator

I. INTRODUCTION

The following report was written for Phil Martin & Associates. It summarizes the results of Phase II significance evaluations of six properties that lie within the 199-acre Armstrong Ranch Specific Plan. The study area is located in the City of Ontario southeast of the intersection of Vineyard Avenue and East Riverside Drive, San Bernardino County. Ontario Avenue transects the eastern portion of the Specific Plan from north to south. Historic and architectural significance evaluations were made pursuant to criteria found in the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), and The City of Ontario's Historic Context For the New Model Colony Plan Area (Historic Context).

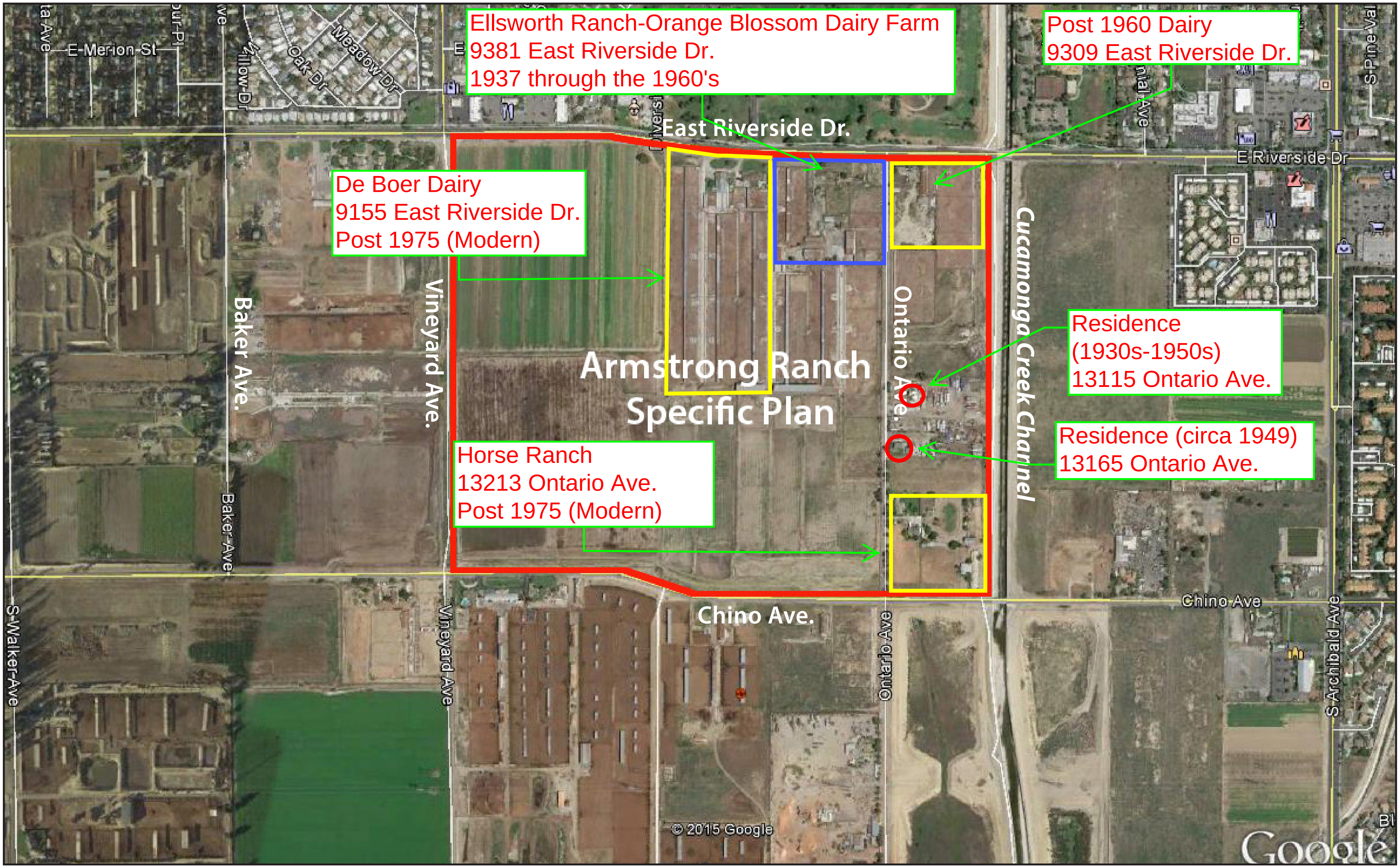
The results of the records search conducted at the South Central Coastal Information Center (SCCIC), California State University, Fullerton indicated that several previous cultural resource investigations have taken place within the study area (Hearn 1979 Tang 2006, and Wetherbee 2007). In particular, the 2006 CRM Tech survey undertaken by Tang resulted in the identification of several historic period buildings within the Specific Plan. A number of evaluations were undertaken although some of the structures were of insufficient age (less than 50 years) for consideration at the time of CRM Tech's assessment (Tang 2006).

The intent of the present Phase II program was to: 1) evaluate those buildings/structures that are now 50 years of age or older and, 2) reevaluate previously NRHP/CRHR evaluated resources for local significance through application of the criteria found in the City's Historic Context. It is to be emphasized that this is a summary document. More detailed information addressing each of the evaluated properties (including discussions of eligibility pursuant to NEPA, CRHR and City of Ontario criteria) be incorporated into the DPR 523 forms packages that are currently being prepared for the project. Are findings are as follows:

II. FINDINGS

<u>1. 9155 East Riverside Drive (De Boer Dairy)</u>

This dairy complex was constructed sometime after 1975 and is less than 50 years of age. Consequently, it is not considered historic and merits no further consideration. Operations at this location are minimal although the property is well maintained and currently occupied.



Source: Google Earth

Figure 1
Properties Studied

2. 13123 Ontario (horse ranch)

This sprawling horse property was developed sometime after 1975 and is less than 50 years of age. Consequently, it is not considered historic and merits no further consideration. This is an active horse ranch that is very well maintained.

3. 13165 Ontario (residence, trucking yard)

No access was provided to this property and all observations were from the street. This single-story, wood framed residence was constructed circa 1949 and remodeled in 1958-1959. Architecturally, it is vernacular borrowing from several other styles. It is not a ranch style home. It is currently occupied and appears to be in good condition. This building was evaluated by Tang in 2006 and found ineligible for the NRHP and the CRHR (Tang 2006). It is not connected to any dairy operation. The City's Historic Context listing for this property is "commercial" (Galvin 2004: 84). It does not appear to meet Historic Context criteria for local significance.

4. 13115 (residence, nursery)

No access was provided to this property and all observations were from the street. This was a less than ideal situation as this house is set back from the road. No firm construction date for this 2-story, wood framed residence has been determined. However, map research has indicated that the residence likely dates from the late 1930's to the early 1950's. It is unclear if the house is occupied and looks to be in fair condition at best.

Architecturally, the building comprises a bizarre combination of additions whose intent was to add usable interior space with disregard to architectural continuity. Perhaps the only interesting thing about this house is the use of multiple hipped gables. It is not a ranch style home. It was not connected to any dairy operation and it is not listed in the City's Historic Context. Subsequent evaluation of this residence indicates that it does not appear eligible for the NRHP or the CRHR. Furthermore, it does not appear to meet Historic Context criteria for local significance.

5. 9309 Ontario (post 1960 dairy farm)

This is an abandoned diary whose original buildings comprised a house and a milking parlor of mixed architecture elements. The City's Historic Context lists this as a "Post 1960

Dairy Farm" (Galvin 2004:84). Map research indicates that original construction dates to the early 1960's. Later buildings include storage and pole barns and a detached garage. The buildings are in very poor condition. The property is currently occupied by a number of people that live in travel trailers/campers. They have livestock and a large garden. The house is not occupied. Subsequent evaluation of this dairy complex indicates that it does not appear eligible for the NRHP or the CRHR. Furthermore, it does not appear to meet Historic Context criteria for local significance.

6. 9381 East Riverside Drive (Orange Blossom Dairy Farm/Ellsworth Ranch)

This property has an interesting history. Presently, it is best described as an abandoned horse ranch comprising numerous derelict buildings and structures. The City's Historic Context lists the property as a "Post 1960 Dairy Farm" which is patently incorrect (Galvin 2004:84).

Originally, the property was owned by Giovanni and Theresa Scarrone from 1937-1942. They constructed two small houses and a milking parlor (none in the ranch style). Not much is known about their operation as it was short lived. In 1945 the property was sold to Major Corliss Champion Moseley, a veteran of WWI (pilot) and owner/participant of many early and notable aviation enterprises.

For reasons that are not yet clear, Moseley assembled a heard of 75 pure bred and registered Jersey cattle from different sources and brought them to the property which he named the "Orange Blossom Dairy Farm". Moseley did not have a background in animal husbandry nor the dairy business. Rather, his forte was aviation based enterprises which he was very successful at. It does not appear that Moseley lived on the property as reference to his place of residence during the mid-1940's was Beverly Hills. The records are very scant on what he did with his herd of cows and his prize stud bull but in 1945 Moseley sold the property off to a woman by the name of Milla Naylor. The same year, Naylor sold the farm to a man named Ellsworth.

Rex C. Ellsworth was a cattleman from Arizona. He was a devout Mormon and as such did not smoke or drink. He was a good judge of horses but treated them heavy-handedly. He was a free wheeling businessman that likely lost more money than he made. By all accounts, he was a "rugged individualist". In 1933, Ellsworth made his way from Lexington, Kentucky to California with his brother and six mares for which he had paid six hundred dollars.

In 1945, Ellsworth bought the Orange Blossom Dairy Farm from Naylor and changed the name to the Ellsworth Ranch. He was not particularly interested in milk cows, rather race horses. Sometime after, he bought 200 acres in Chino that he also named the Ellsworth Ranch. This has led to some confusion in the historical record. In 1947, Ellsworth and his boyhood friend and now partner Meshach Tenney (known as Mish or Mesh), bought a champion European stud by the name of Khaled. Ellsworth bred Khaled to a blooded mare by the name of Iron Reward at his new ranch on Riverside Drive. In 1952, their union produced the colt "Swaps" so named as Ellsworth and Tenney kept "swapping" names and finally gave up settling on Swaps. Swaps was a very popular horse with fans and a big winner at all the west coast tracks. Never to turn down a challenge, Ellsworth entered Swaps in the 1955 Kentucky Derby and won. Swaps continued to race until 1956 but had foot trouble. Ellsworth sold the stallion in 1957 for the unprecedented amount of two million dollars.

With his considerable winnings, Ellsworth expanded his operation tearing down a number of older buildings and erecting many new ones. New construction included the main barn, stable, tractor barn, office, a third residence joined to one of three originals and pole barn. The two houses erected by the Scarrone's were heavily modified and the milking parlor was either demolished or converted into a residence (of sorts). Today, all of the buildings, especially the residences, are in very, very poor condition. Ellsworth operated his breeding ranch on Riverside Drive until 1975 when his empire began to crumble due to financial woes followed by accusations of animal neglect by the SPCA.

In 2006, Tang (CRM Tech) evaluated three buildings on the Ellsworth Ranch (9381-A, B, & C Riverside Drive). These included the two original residences from the Scarrone era and a converted storage barn/residence that may actually be the remains of the Scarrone milking parlor. These were the only buildings/structures evaluated and none were found eligible for the NRHP/CRHR.

In reevaluating the complex as it presents itself today, it may be noted that architecturally, none of the buildings are unique in design, choice construction materials or methods of construction. Many have been heavily modified over the years and several are in extremely poor condition. Consequently, none appear eligible for the NRHP, CRHR on architectural grounds (Criterion C of the NRHP and CRHR) or that of the City's Historic Context.

That leaves consideration for historical significance under Criteria A (important events) and B (important people). Moseley's association with the property was short lived. It does not appear that he improved the property significantly nor is there any supporting evidence that he lived there. His background as a pioneer in the aviation industry is notable but his foray into the dairy cattle business seems as if it were more of a potential financial opportunity rather than a long-term, serious undertaking. Furthermore the record is lacking with regard to the impact, positive or negative, that his herd had on the dairy industry. Whatever his motives were, the property does not appear historically important in connection with Maj. Moseley or his Jersey cattle.

Ellsworth's legacy is a different story altogether but also merits consideration. In the early days, Ellsworth was known as a west coast horse breeder and owner. It was not until he won the Kentucky Derby in 1955 that he was accepted into the circles of upper crust horse racing. Ellsworth never had another champion like Swaps but came close in 1963 with Candy Spots, an offspring of Swaps who took 2nd place at the Kentucky Derby. For many years, due to his success with Swaps, Candy Spots and many others, he was a considered a noted breeder and had a large clientele.

Ellsworth owned the property for over 30 years and constructed nearly all of the improvements that survive today. He kept a residence there as did his family. Swaps was born on the ranch and presumably trained there. Consequently, the Ellsworth Ranch does not appear eligible for the NRHP under Criteria A or B, but does appear eligible for the CRHR under Criteria A and B as well as for local significance pursuant to the City's Historic Context guidelines.

III. CONCLUSIONS AND RECOMMENDATIONS

Two of the properties within the Armstrong Ranch Specific Plan are less than 50-years of age and merit no further discussion as they are considered modern. Of the four properties evaluated, three do not appear to be historically or architecturally significant pursuant to the criteria found in the NRHP, CRHR or the City's Historic Context. The fourth property, appears eligible only for the CRHR under Criteria A and B as well as meeting local Historic Context criteria. No additional work in conjunction with historical resources is recommended for five of six properties.

Prior to demolition, it is recommend that a professional photographer, under the direction of the Project Archaeologist/Historian, take high quality digital and/or film photographs of exteriors of the surviving buildings at the Ellsworth Ranch (9381 East Riverside Drive.) This will provide adequate mitigation of impacts. The final images will be presented to the City of Ontario for archiving.

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WETHERBEE, MATTHEW and SARAH SIREN, GAVIN ARCHER
2007 *Cultural Resource Assessment, New Model Colony East Backbone Infrastructure, City of Ontario, San Bernardino County, California*. Unpublished report on file with STANTEC, Irvine.

CULTURAL RESOURCES RECORDS SEARCH UPDATE AND SUMMARY FOR THE ARMSTRONG RANCH SPECIFIC PLAN, 199-ACRES LOCATED SOUTHEAST OF THE INTERSECTION OF VINEYARD AVENUE AND EAST RIVERSIDE DRIVE, CITY OF ONTARIO, RIVERSIDE COUNTY

by:

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Prepared for:

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Irvine, CA 92620

Section 10 (partially projected), Township 2 South, Range 7 West, SBBM

Guasti 7.5' USGS Topographic Quadrangle

Revised
July, 2016

KEYWORDS: Records Search Update, City of Ontario, San Bernardino County

The undersigned certifies that the attached report is a true and accurate description of the results of a CULTURAL RESOURCES UPDATE described herein.

Robert S. White

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Robert S. White
Principal Investigator

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

MANAGEMENT SUMMARY

At the request of Phil Martin & Associates, Archaeological Associates has undertaken a records search update and summary for the 199-acre Armstrong Ranch Specific Plan. The property is located in the City of Ontario southeast of the intersection of Vineyard Avenue and East Riverside Drive, San Bernardino County.

The purpose of this assessment was to update the cultural resources records search for the specific plan area and provide a summary of all cultural resource assessments conducted to date. This information is desired since adoption of the proposed development plan could result in adverse effects upon locations of archaeological or historical importance. Presently, project proponents desire to divide the property into six low density residential planning areas and a school site.

The results of the records search conducted at the South Central Coastal Information Center (SCCIC), California State University, Fullerton indicated that no prehistoric archaeological sites have been recorded within the boundaries of the study area. No evidence of prehistoric activity was found during one complete and two partial surveys of the Specific Plan area. Therefore, no further work in conjunction with prehistoric resources, including monitoring of any future grading activities, is warranted or recommended unless such resources are encountered during future development of the study area.

Four historic period buildings have been identified within the Specific Plan. None of the buildings/structures evaluated for the project appear significant within the meaning of CEQA. No further work in conjunction with historic resources, including monitoring of any future grading activities, is warranted or recommended unless such resources are encountered during future development of the study area.

In the event that human remains are encountered during the course of any future development, California State Law (*Health and Safety Code Section 7050.5 and Section 5079.98 of the Public Resources Code*) states that no further earth disturbance shall occur at the location of the find until the San Bernardino County Coroner has been notified. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD).

I. INTRODUCTION

The following report was written for Phil Martin & Associates by Archaeological Associates. It describes the results of a records search update and summary for the 199-acre Armstrong Ranch Specific Plan. The study area encompasses numerous parcels, predominately dairy operations that are generally defunct. The property is located in the City of Ontario southeast of the intersection of Vineyard Avenue and East Riverside Drive, San Bernardino County. Presently, project proponents desire to divide the property into six low density residential planning areas and a school site.

The purpose of this assessment was to update the cultural resources records search for the specific plan area and provide a summary of all cultural resource assessments conducted to date. This information is desired since adoption of the proposed development plan could result in adverse effects upon locations of archaeological or historical importance. Our assessment consisted of: (1) an updated records search conducted to determine whether any recently recorded historic or prehistoric material is present on the property, (2) a literature and archival review, and (3) a windshield survey of the study area. No intensive field reconnaissance was performed for this archival update. No additional building evaluations were performed and no Native American Scoping was undertaken.

II. SETTING

A. Study Area Location

Regionally, the study area is located within the southerly portion of the City of Ontario north of Jurupa Valley (Riverside County) and south of Ontario Airport and the 60 Freeway, in San Bernardino County (fig.1). The cities of Fontana and Chino lie to the east and west, respectively. Legally, the subject property comprises the Northwest ¼ and a portion of the Northeast ¼ of Section 10 (fractional and partially projected) Township 2 South, Range 7 West, San Bernardino Base Meridian. Figure 2 illustrates the property on a portion of the USGS *Guasti* 7.5' Topographic Quadrangle (fig. 2).

Specifically, the study area lies immediately southeast of the intersection of Vineyard Avenue and East Riverside Drive. Vineyard Avenue forms the western project boundary, Cucamonga Creek (channelized), the eastern. The northern boundary abuts East Riverside Drive.

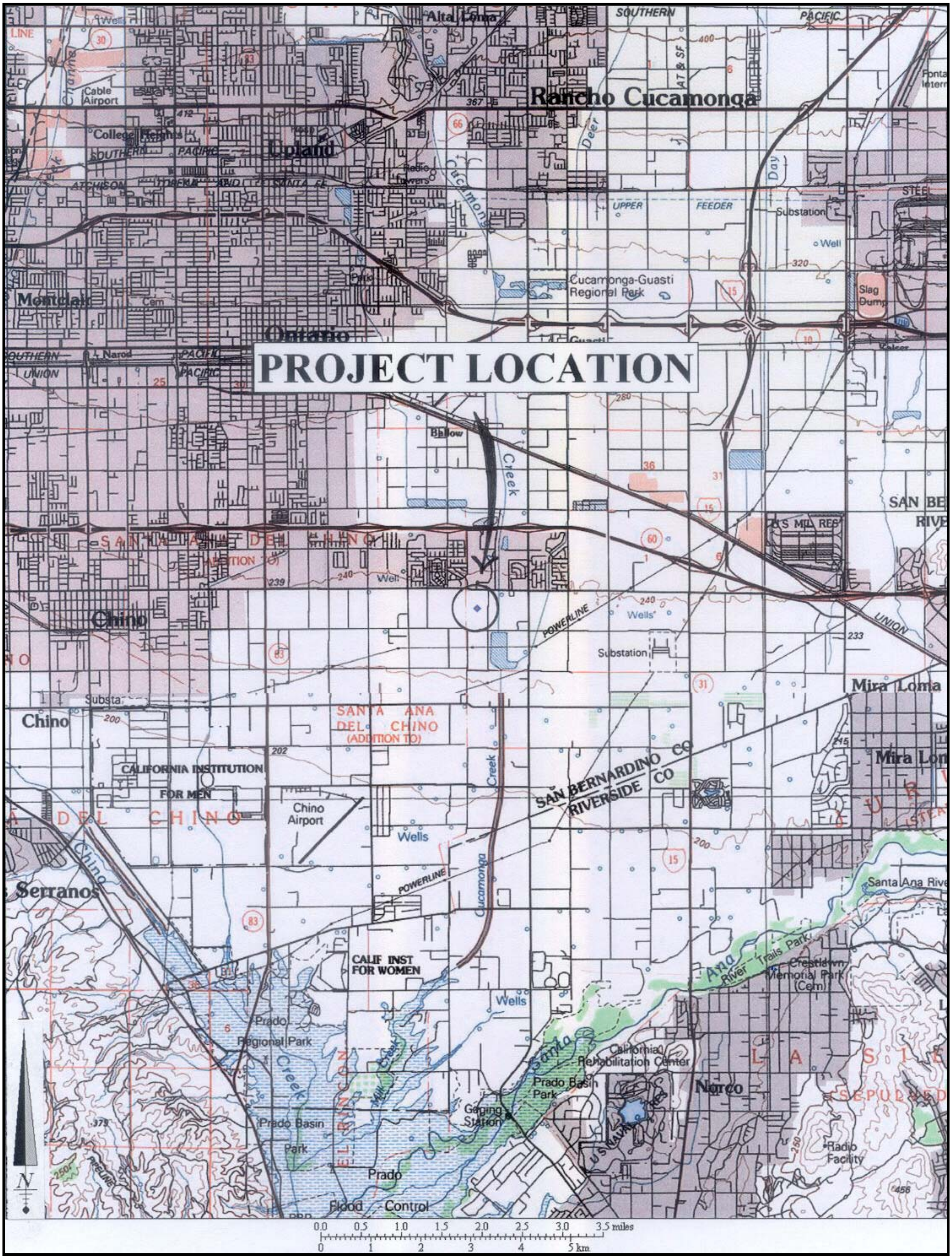


Figure 1. Regional location of the project area as indicated on a portion of the *San Bernardino* USGS 1:100,000 scale topographic map sheet (1982).

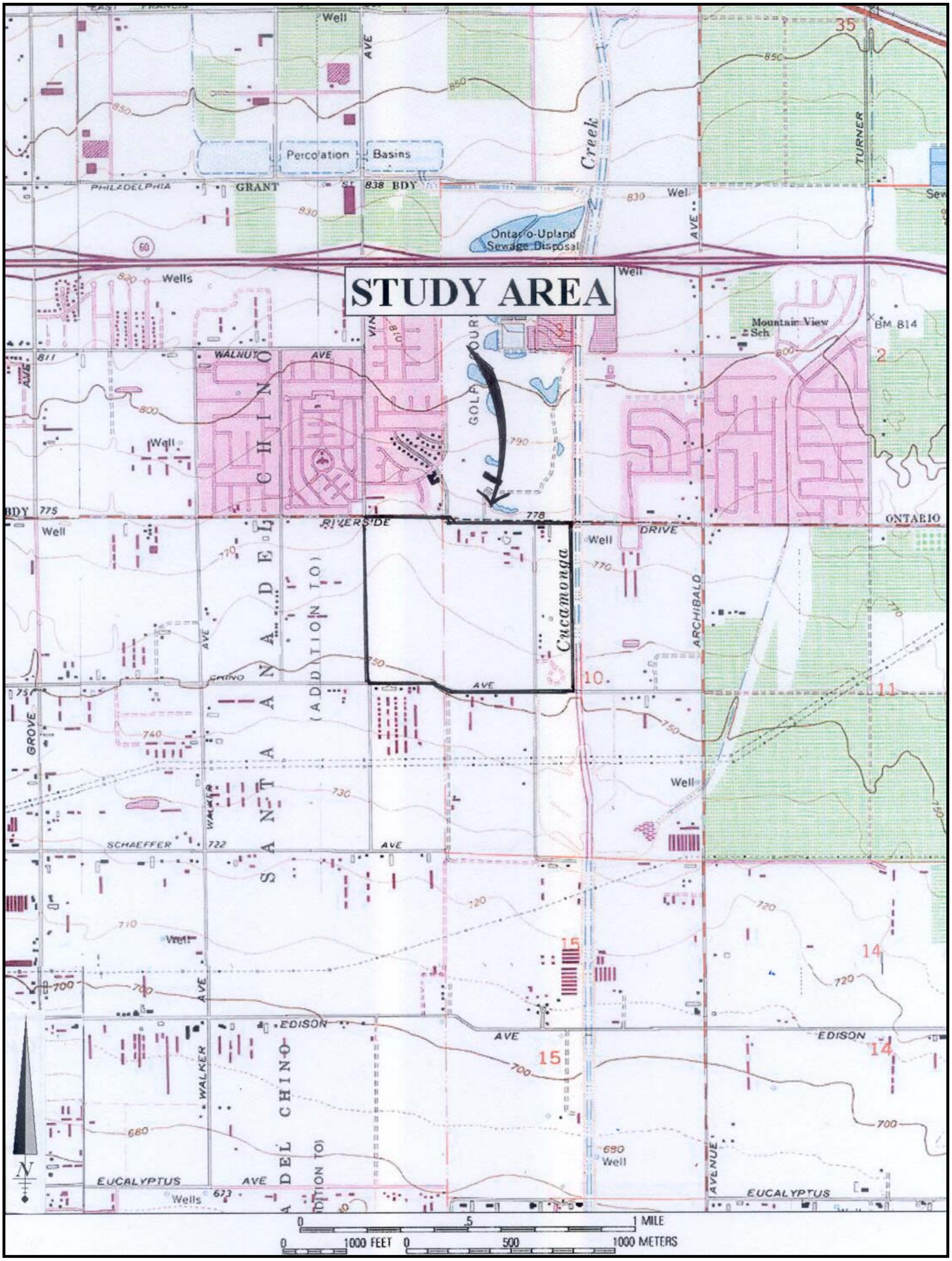


Figure 2. Study area as shown on a portion of the Guasti *7.5'* USGS Topographic Quadrangle (1978/81).

while the southern boundary is delineated by Chino Avenue. Ontario Avenue transects the eastern portion of the specific plan from north to south. (figs 3 & 4.)

III. METHODS

A. Cultural Resources Records Search

An in-person records search of the study area was conducted by Robert S. White at the South Central Coastal Information Center California State University, Fullerton. The search entailed a review of all previously recorded prehistoric and historic archaeological sites situated on or within a one-mile radius of the project area. Additionally, the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying historic properties.

1. Previously Recorded Archaeological Sites Located Within the Study Area

a. Prehistoric Resources

The results of the records search indicated that no prehistoric archaeological sites, or isolates have been previously recorded within the boundaries of the study area.

b. Historic Resources

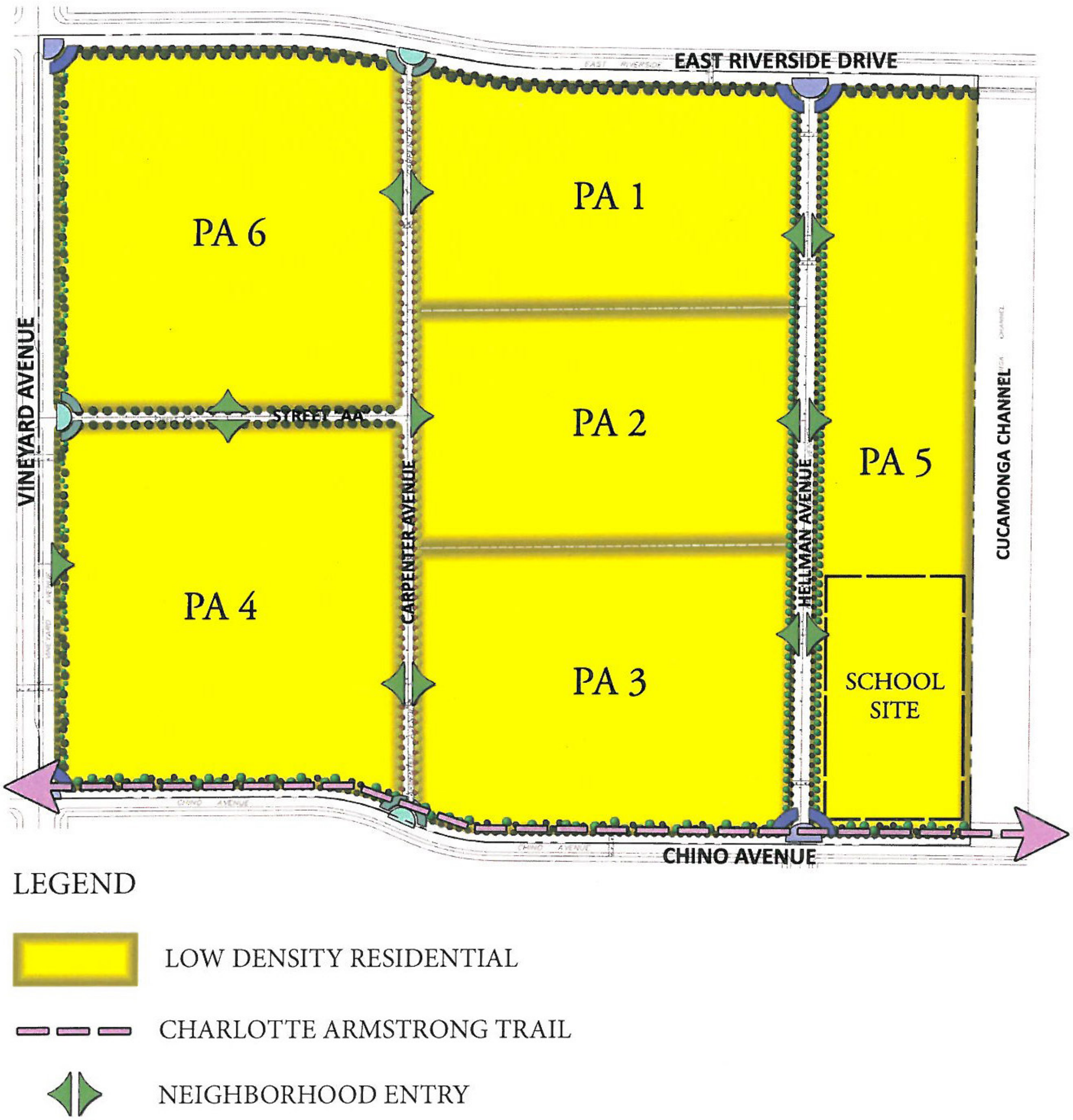
The results of the records search indicated that four historic buildings have been previously recorded within the boundaries of the study area as a result of a 2006 study. Details can be found in Section 5b below.

3. Heritage Properties

Listings of the National Register and California Historical Landmarks indicate that no heritage properties have been recorded within the study area. However, one California Point of Historical Interest is listed along the northern boundary of the Armstrong Ranch Specific Plan. CPHI-SBr-027 (P36-015980) comprises the approximate route followed by Juan Bautista de Anza. Details can be found in Section 5b below.

Source: Google Earth

Figure 3
Aerial Photo



Source: Armstrong Ranch Specific Plan

Figure 4
Proposed Specific Plan

4. Previous Overviews

In 2004, a comprehensive historical framework was prepared for the City of Ontario's New Model Colony Plan Area which included the current Armstrong Ranch Specific Plan (Galvin & Associates 2004). This extremely well-researched document provided a historical context for the area that focused on the dairy industry. Although it did not specifically evaluate each property for historical significance, it nonetheless provided a very complete framework for future focused historical assessments. It is highly recommended reading and can be found on the City's website.

5. Previous Surveys Within the Study Area

a. San Bernardino Museum Association, Chino Avenue

In 1979, the San Bernardino County Museum Association conducted a pedestrian survey of a section of Chino Avenue, a portion of which forms the southern boundary of the Armstrong Ranch Specific Plan. The results of the survey failed to identify any prehistoric or historic resources within the right-of-way of the road improvement project (Hearn 1979).

b. CRM Tech, old Planning Area 4

In 2006, CRM Tech undertook a historical/archaeological survey of 280±acres of dairy lands then identified as Planning Area 4 (CRM Tech 2006). The Armstrong Ranch Specific Plan comprises the eastern 199-acres of old Planning Area 4. Prior to CRM Tech's study, no prehistoric or historic resources had been recorded within the Specific Plan area. However, one linear historic resource was believed to have been situated just south of and paralleling Riverside Drive, the Specific Plan northern boundary. It is described as follows:

> Site P36-015980 consists of the approximate route followed by Juan Bautista de Anza's historic overland expeditions of 1774-1776, which has been designated a California Point of Historic Interest (CPHI-SBr-027). No physical features associated with the de Anza expeditions were ever recorded along the route, and the exact location and course of the route are largely unknown. In the Ontario area, the site is represented by a commemorative marker in Anza Park, more than two miles northwest of the project location. Since no features associated with the site are known to exist in the

project vicinity, P36-015980 requires no further consideration during this study (ibid: 6).

As a result of their study, CRM Tech did not identify any prehistoric resources within the boundaries of the Specific Plan. They did, however, record and evaluate four historic period buildings connected with the dairy industry. They are summarized in Table 1 below:

Table 1. Recorded Historic Buildings within the Armstrong Specific Plan

Site Number (P36-0)	**Building Description**
13241	APN 218-102-11. Ranch style residence with attached two-car garage. Possibly constructed between 1942-1949, perhaps later. Located at 9381-A Riverside Drive.
13242	APN 218-102-11. Vernacular style, multiple family residence. Possibly constructed between 1942-1949, perhaps later. Located at 9381-B Riverside Drive.
13243	APN 218-102-11. Storage barn converted into a Ranch style residence. Possibly constructed between 1942-1949, perhaps later. Located at 9381-D Riverside Drive.
13244	APN 218-111-05. Vernacular style single family residence. Constructed circa 1949. Located at 13165 Ontario Avenue.

Subsequent evaluations conducted by CRM Tech concluded that none of the four buildings appeared to qualify as “historical resources” as defined by the California Environmental Quality Act (CEQA). No further work was recommended (CRM Tech 2006).

c. Stantec, 2007

In 2007, Stantec undertook a cultural resources assessment of the New Model Colony East Backbone Infrastructure project. The project entailed numerous street, bridge, flood control and underground utility improvements throughout the large planning area (Stantec 2007). Stantech concurred with CRM Tech’s 2006 study that the approximate route (P36-015980, CPHI-SBr-027) followed by Juan Bautista de Anza through the current study area and beyond had been obliterated. Furthermore, Stantec did not identify any prehistoric or historic resources within the street/channel alignments that fall within the Armstrong Ranch Specific Plan. No further work, including monitoring of earth disturbing activities was recommended.

IV. WINDSHIELD SURVEY

A windshield survey of the built environment indicated that all four buildings identified by CRM Tech in 2006 survive today. In fact, although numerous other buildings within the Specific Plan area have been abandoned or shuttered, few if any appear to have been demolished.

V. MANAGEMENT CONSIDERATIONS

A. Prehistoric Resources

The records search indicated that no prehistoric resources have been identified within the boundaries of the Armstrong Ranch Specific Plan over the course of two partial and one complete assessment. Therefore, no further work in conjunction with prehistoric resources, including monitoring of any future grading activities, is warranted or recommended unless such resources are encountered during future development of the study area.

1. Discovery of Human Remains

In the event that human remains are encountered during the course of any future development, California State Law (*Health and Safety Code Section 7050.5 and Section 5079.98 of the Public Resources Code*) states that no further earth disturbance shall occur at the location of the find until the San Bernardino County Coroner has been notified. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendant (MLD).

B. Historic Resources

Four historic period buildings have been identified within the Specific Plan. None of the buildings/structures evaluated for the project appear significant within the meaning of CEQA. Therefore, no further work in conjunction with cultural resources is recommended for these buildings.

In their 2006 study, CRM Tech pointed out that there were other structures within their study area (old Planning Area 4) that were less than 50 years in age and considered modern. Several of these fall within the boundaries of the Armstrong Ranch Specific Plan. Although some may now be 50 years of age or older, CRM Tech observed:

> Also noted in the project area were numerous additional residences, and a large number of other utility structures associated with these residences. Less than 50 years old and lacking any special historic, architectural, or aesthetic merits, these buildings and structures do not demonstrate the potential to qualify as "historical resources," and were therefore not recorded (CRM Tech 2006).

No further work in conjunction with historic resources, including monitoring of any future grading activities, is warranted or recommended unless such resources are encountered during future development of the study area.

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2006 *Historical/Archaeological Resources Survey Report, Planning Area 4, Riverside Drive and Walker Avenue, City of Ontario, San Bernardino County, CA.* Unpublished report on file with CRM Tech, Colton.

WETHERBEE, MATTHEW and SARAH SIREN, GAVIN ARCHER
2007 Cultural Resource Assessment, New Model Colony East Backbone Infrastructure, City of Ontario, San Bernardino County, California. Unpublished report on file with STANTEC, Irvine.

APPENDIX A: Personnel Qualifications

RÉSUMÉ OF

ROBERT S. WHITE

Principal, Archaeological Associates

Mr. White has been affiliated with Archaeological Associates since 1983. Starting in 1991 he became the firm's Director and in 2013, Principal. Mr. White has extensive experience in many aspects of cultural resource management, including but not limited to, project administration, field survey, excavation, lab analysis, land survey and cartography, archival research, budgeting, planning, and report writing/production. In those jurisdictions requiring professional certification, Mr. White is certified by the Counties of Riverside, Orange, and Ventura to conduct all phases of archaeological investigation.

Since 1983, Mr. White has conducted well over 500 prehistoric and historic archaeological investigations in Riverside, San Bernardino, Los Angeles, Orange, Kern, San Diego, Imperial, Sonoma, and Inyo Counties. Additionally, in concert with colleague Dr. David Van Horn, they have pioneered innovative techniques that revolutionized data recovery programs on large, low-density archaeological sites.

EDUCATION

B.A., Liberal Studies (emphasis in Anthropology), California State University Long Beach, 1987

A.A., Liberal Arts, Los Angeles Harbor College, 1977

PROFESSIONAL HISTORY

Joined Archaeological Associates in 1983
1991 to 2013, Director of Archaeological Associates
2013 to Present, Principal of Archaeological Associates
Riverside County Approved Archaeologist #164
Orange County Approved Archaeologist

PROFESSIONAL AFFILIATIONS

American Committee for the Preservation of Archaeological Collections (ACPAC)
Pacific Coast Archaeological Society.

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TRAINING

Tortoise Awareness Training. Joshua Tree, San Bernardino County (September, 2008).

SB 18 Consultation Seminar. Riverside (December, 2005). Offered through the Governor's Office of Planning and research et. al.

* 1987 B.A. in Liberal Studies with emphasis in Anthropology, California State University, Long Beach.
* 1977 A.A. Degree in Liberal Arts, Los Angeles Harbor College.
* Riverside County Certified Archaeologist #164
* Orange County Certified Archaeologist
* Over 30 years of full-time experience conducting cultural resource management projects in southern California.

APPENDIX B: Records Search Results

CULTURAL RESOURCES RECORDS SEARCH

An in-person, updated cultural resources records search was conducted by Robert S. White, at the South Central Coastal Information Center at California State University, Fullerton. Consequently, there is no official letter from the Information Center to attach here. The in-person search included a review of all previously recorded prehistoric and historic archaeological sites situated within a one-mile radius of the study area. Additionally, the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks (CHL), California Points of Historical Interest (CPHI), and the California Directory of Properties (DOP, aka the Historic Resources Inventory [HRI]) were reviewed for the purpose of identifying any historic properties. Copies of site record forms were obtained for those resources situated within a one-mile radius of the project. Pertinent archaeological reports were also were reviewed and all relevant information was incorporated into the study.

APPENDIX C

REPORTS

106-5424
SB 5424

HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT

PLANNING AREA 4

Riverside Drive and Walker Avenue, City of Ontario
San Bernardino County, California

For Submittal to:

City of Ontario Planning Department
303 East B Street
Ontario, CA 91764

Prepared for:

Steve Hathaway
Anso Properties
333 El Camino Real, Suite 201
Tustin, CA 92780

Prepared by:

CRM TECH
4472 Orange Street
Riverside, CA 92501

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

October 23, 2006
CRM TECH Contract No. 1790A

Author(s): Bai "Tom" Tang, Principal Investigator/Historian/Architectural Historian
Deirdre Encarnación, Archaeologist/Report Writer
Daniel Ballester, Archaeologist
Josh Smallwood, Historical Archaeologist
Terri Jacquemain, Historian

Consulting Firm: CRM TECH
4472 Orange Street
Riverside, CA 92501
(951) 784-3051

Date: October 23, 2006

Title: Historical/Archaeological Resources Survey Report: Planning Area 4, Riverside Drive and Walker Avenue, City of Ontario, San Bernardino County, California

For Submittal to: City of Ontario Planning Department
303 East B Street
Ontario, CA 91764

Prepared for: Steve Hathaway
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333 El Camino Real, Suite 201
Tustin, CA 92780

USGS Quadrangle: Guasti, Calif., 7.5' quadrangle (Portions of the Addition to Santa Ana del Chino land grant and Section 10, T2S R7W, San Bernardino Base Meridian)

Project Size: Approximately 280 acres

Keywords: City of Ontario, San Bernardino County; historical/archaeological resources survey; Assessor's Parcel Nos. 216-173-01 to -012; 216-174-01 to -03, -06 to -09, and -15 to -17; 218-101-01 to -08; 218-102-1 to -4, -7, -8, -10 and -11; 218-111-04 to -06, -08 to -12, -45, -45, and -50; late historic-period residential buildings (1940s-1950s)

MANAGEMENT SUMMARY

Between January and October 2006, at the request of Anso Properties, CRM TECH performed a cultural resources study on approximately 280 acres of rural land in the City of Ontario, San Bernardino County, California. The subject property of the study is located on the south side of Riverside Drive between Walker Avenue and the Cucamonga Creek Flood Control Channel, in Section 10, T2S R7W, San Bernardino Base Meridian, and a portion of the Santa Ana del Chino (Addition) land grant. The study is part of the environmental review process for a proposed development project on the property. The City of Ontario, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA).

The purpose of the study is to provide the City of Ontario with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any historical/archaeological resources that may exist in or around the project area, as mandated by CEQA. In order to identify and evaluate such resources, CRM TECH initiated a historical/archaeological resources records search, pursued historical background research, and carried out a field survey.

As a result of these research procedures, 16 late-historic-period buildings, including 15 residences and a dairy barn, were identified and recorded within the project area, but were determined not to qualify as "historical resources," as defined by CEQA. Also noted in the project area were numerous additional residences, and a large number of other utility structures associated with these residences. Less than 50 years old and lacking any special historic, architectural, or aesthetic merits, these buildings and structures do not demonstrate the potential to qualify as "historical resources," and were therefore not recorded. No archaeological sites or other potential "historical resources" were encountered during the course of the study.

Based on the research results summarized above, CRM TECH recommends to the City of Ontario a finding that the proposed project will have *no impact* on any known historical resources. No further cultural resources investigation is recommended for the project unless development plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during any earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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LIST OF FIGURES

INTRODUCTION

Between January and October 2006, at the request of Anso Properties, CRM TECH performed a cultural resources study on approximately 280 acres of rural land in the City of Ontario, San Bernardino County, California (Fig. 1). The subject property of the study is located on the south side of Riverside Drive between Walker Avenue and the Cucamonga Creek Flood Control Channel, in Section 10, T2S R7W, San Bernardino Base Meridian, and a portion of the Santa Ana del Chino (Addition) land grant (Fig. 2). The study is part of the environmental review process for a proposed development project on the property. The City of Ontario, as Lead Agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.).

CRM TECH performed the present study to provide the City of Ontario with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any historical/archaeological resources that may exist in or around the project area, as mandated by CEQA. In order to identify and evaluate such resources, CRM TECH initiated a historical/archaeological resources records search, pursued historical background research, and carried out a field survey. The following report is a complete account of the methods, results, and final conclusion of the study.

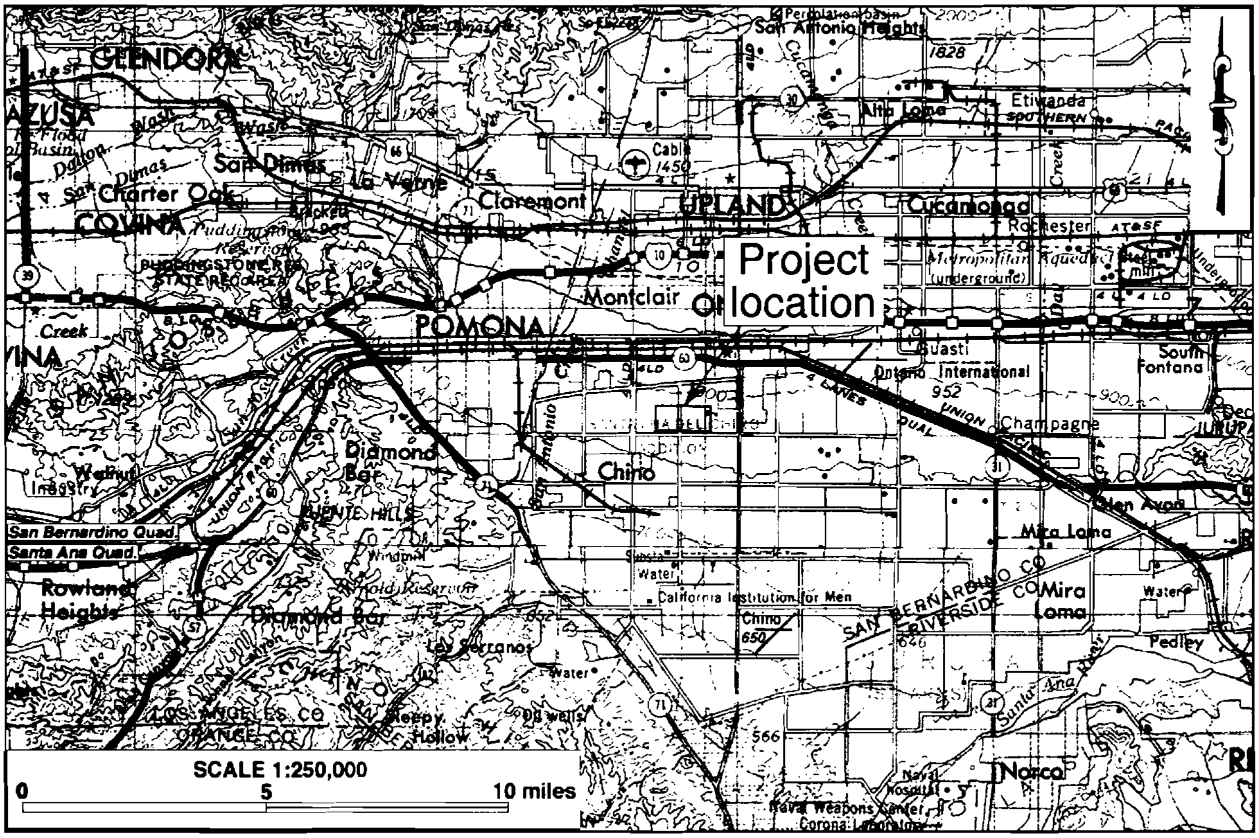

Figure 1. Project vicinity. (Based on USGS San Bernardino and Santa Ana, Calif., 1:250,000 quadrangles [USGS 1969; 1979])

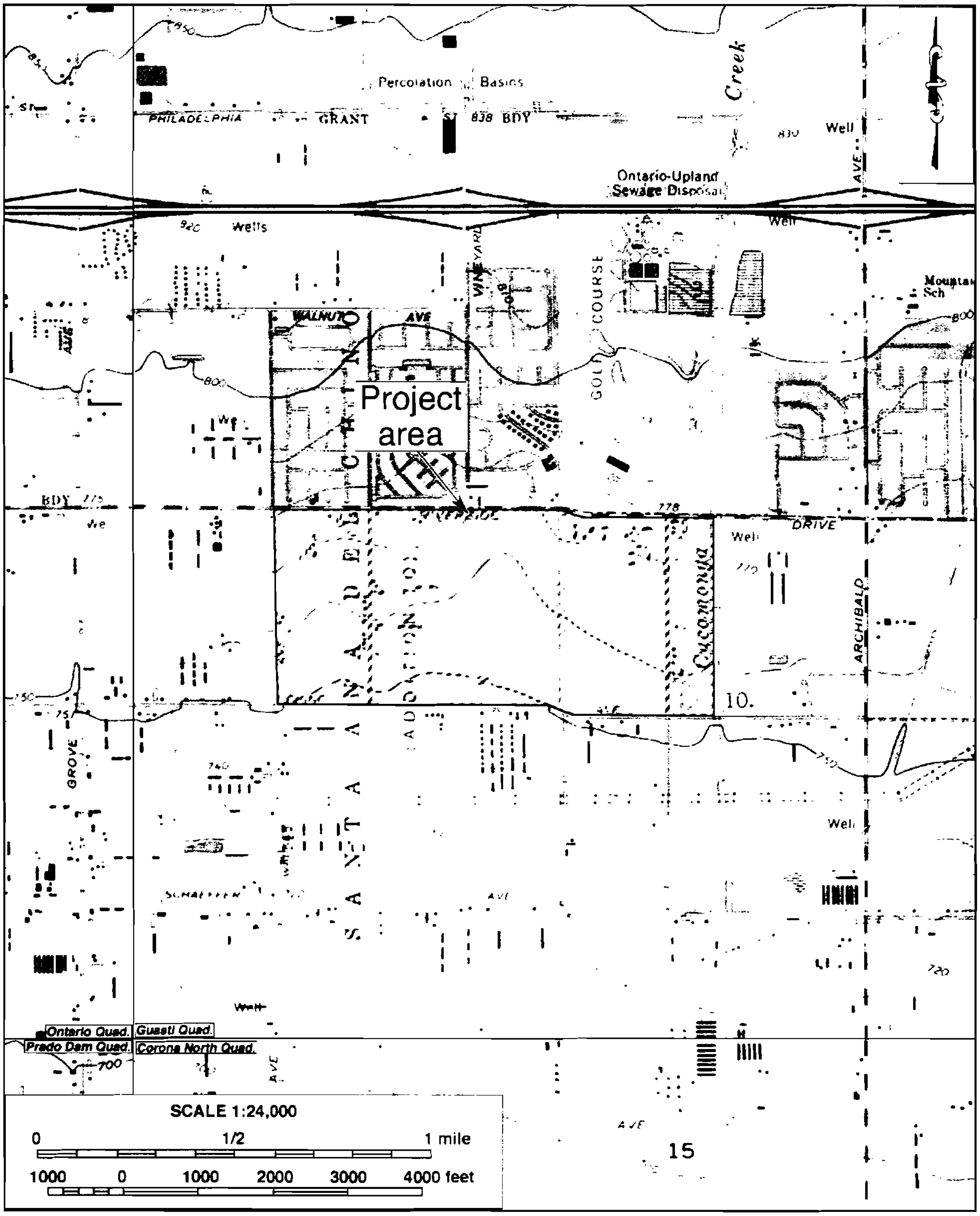

Figure 2. Project area. (Based on USGS Corona North, Guasti, Ontario, and Prado Dam, Calif., 1:24,000 quadrangles [USGS 1981a-d])

SETTING

CURRENT NATURAL SETTING

The subject property is situated in the western San Bernardino Valley, a region that was formerly dominated by agriculture, especially the dairy industry, but is currently undergoing rapid urban growth. It lies approximately nine miles south of the San Gabriel Mountains and five miles north of the San Ana River, the main natural waterway in the San Bernardino Valley. The terrain in the project area is relatively level, with elevations ranging approximately from 750 to 780 feet above mean sea level.

The project area is bounded by Chino Avenue on the south, Walker Avenue on the west, Riverside Drive on the north, and the Cucamonga Creek Flood Control Channel on the east. The property includes four dairy complexes and their related buildings and structures, including animal pens, metal canopies, and waste reservoirs (Fig. 3). The central portion of the project area also contains agricultural fields, many of them currently under cultivation. More than 25 single-family residences and ancillary buildings were also noted in the project area. Very little native soil is visible. Vegetation in the vicinity consists mainly of ornamental landscaping such as lawns, trees, and bushes.

CULTURAL SETTING

Prehistoric Context

The project area lies on the eastern edge of the traditional territory of the Gabrielino, a Takic-speaking people who were considered the most populous and most powerful ethnic group in aboriginal southern California (Bean and Smith 1978:538). The Gabrielino territory reached from San Clemente Island to the present-day San Bernardino-Riverside area and south into southern Orange County, but their influence spread as far as the San

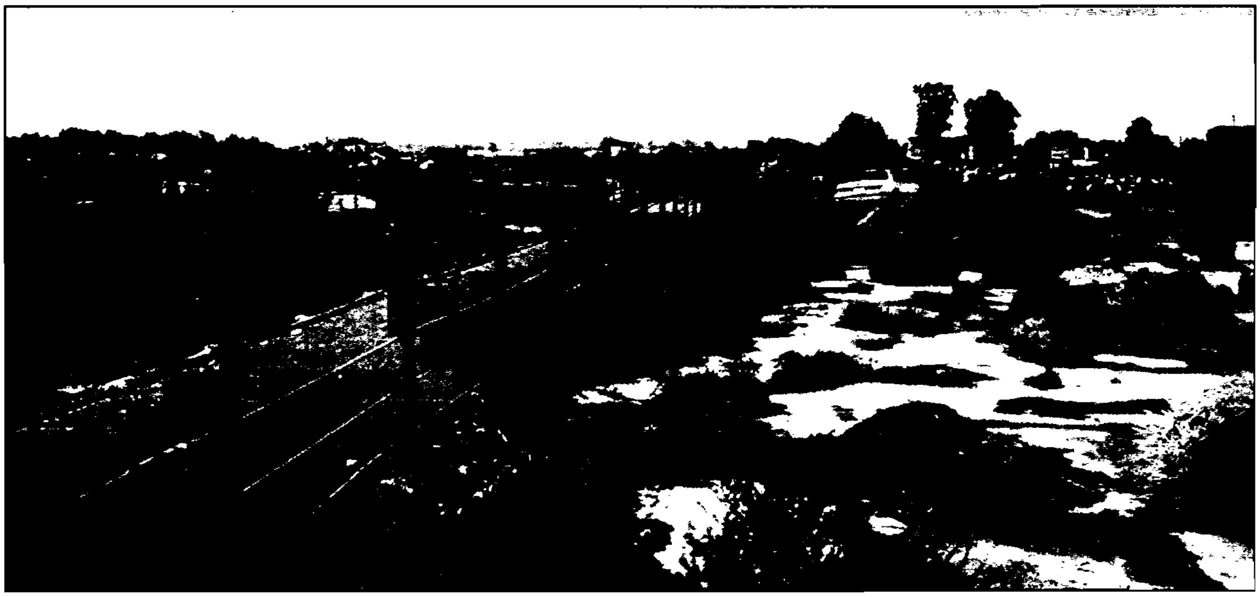

Figure 3. Typical landscape in the project area. (Photo taken on March 9, 2006)

Joaquin Valley, the Colorado River, and Baja California. Unfortunately, most Gabrielino cultural practices had declined long before systematic ethnographic studies were instituted. As a result, knowledge about them and their lifeways is meager. Today, the leading ethnographic sources on Gabrielino culture are Bean and Smith (1978) and McCawley (1996).

According to archaeological record, the Gabrielino were not the first inhabitants of the Los Angeles Basin, but arrived around 500 B.C., slowly replacing the indigenous Hokan speakers. As early as 1542, the Gabrielino were in contact with the Spanish during the historic expedition of Juan Rodríguez Cabrillo. But it was not until 1769 that the Spaniards took steps to colonize Gabrielino territory. Shortly afterwards, most of the Gabrielino people were incorporated into Mission San Gabriel and other missions in southern California. Due to introduced diseases, dietary deficiencies, and forceful reduction, Gabrielino population dwindled rapidly. By 1900, they had almost ceased to exist as a culturally identifiable group (Bean and Smith 1978:540). In recent decades, however, there has been a renaissance of Native American activism and cultural revitalization among a number of groups of Gabrielino descendants.

Historic Context

The San Bernardino Valley, along with the rest of Alta California, was claimed by Spain in the late 18th century, and the first European explorers traveled through the area as early as 1772, only three years after the beginning of Spanish colonization. For nearly four decades afterwards, however, the arid inland valley received little attention from the colonizers, who concentrated their efforts along the Pacific coast. Following the establishment of Mission San Gabriel in 1771, the San Bernardino Valley became a part of the mission's vast land holdings. The name "San Bernardino" was bestowed on the region at least by 1819, when a mission rancho bearing that name was established in the eastern end of the valley.

After Mexico gained independence from Spain in 1821, the new authorities in Alta California began to dismantle the mission system in 1834 through the process of secularization. During the next 12 years, former mission ranchos throughout Alta California were surrendered to the Mexican government, and subsequently divided and granted to various prominent citizens of the province. In 1843, the western portion of the project area was included in an addition to the Santa Ana del Chino land grant and awarded to Isaac Williams, a Yankee-turned *ranchero*, who developed his 35,000-acre domain into a prosperous agricultural empire before his death in 1856.

The U.S. annexation of Alta California in 1848 brought waves of American immigrants into the once sparsely populated territory. In the 1880s, spurred by the completion of the Southern Pacific Railroad and the competing Santa Fe Railroad, a land boom swept across much of southern California. A large number of towns, surrounded by irrigated farmland, were laid out in the San Bernardino Valley before the boom collapsed toward the end of the decade. Among them were Etiwanda and Ontario, both founded in the early 1880s by George Chaffey, a prominent local developer who had migrated from Canada in 1880.

It was in the creation of these two colonies that Chaffey pioneered the influential concept of the mutual water company, by which water rights, a precious commodity in southern California, are directly tied to land ownership. Thanks partially to this practice, the Etiwanda and Ontario colonies survived the disastrous drought of the 1890s that brought an end to the land boom, and flourished with the rise of the citrus industry as the leading economic pursuit in rural southern California. The area soon became known for the cultivation of citrus fruits and, to a lesser extent, olives and grapes.

In 1891, Ontario, the larger of the two colonies, incorporated as a city, but agriculture remained the primary livelihood of the region through much of the 20th century. During the recent decades, due to its favorable location near the Greater Los Angeles area and major transportation nexuses, the western San Bernardino Valley has become one of the fastest growing regions in inland southern California, spearheaded by Ontario and Rancho Cucamonga. In a historic break from the region's citrus-dominated past, industrial, residential, and commercial development has been the driving force behind the current "boom" in the two cities and the surrounding area.

RESEARCH METHODS

RECORDS SEARCH

The Archaeological Information Center (AIC) at the San Bernardino County Museum, Redlands, provided the records search service for this study. The AIC is the official cultural resource records repository for San Bernardino County, and a part of the California Historical Resource Information System, established and maintained under the auspices of the Office of Historic Preservation.

During the records search, Robin Laska, AIC Assistant Coordinator, checked the Center's electronic database for previously identified historical/archaeological resources in or near the project area, and existing cultural resources reports pertaining to the vicinity. Previously identified historical/archaeological resources include properties designated as California Historical Landmarks, Points of Historical Interest, or San Bernardino County Historical Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resource Information System.

HISTORICAL RESEARCH

CRM TECH historian Terri Jacquemain (see App. 1 for qualifications) completed the historical research for this study in two phases. The preliminary background research was based on published literature in local and regional history and historic maps of the Ontario area. Among the maps consulted were the U.S. General Land Office's (GLO) land survey plat map dated 1881 and the U.S. Geological Survey's (USGS) topographic maps dated 1902-1903, 1941, and 1953. These maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley.

After completion of the field survey, Jacquemain pursued more focused research on the subject property and historic-period buildings identified in the project area. The focus of the research was to establish the buildings' date of construction, later alterations, roles and uses over the years, and possible associations with important historic figures and/or events. Sources examined during this phase of the research included primarily the archival records of the County of San Bernardino and the City of Ontario, especially real property tax assessment records and building safety records. These primary sources were supplemented with information from various contemporary news reports, oral historical interviews with long-time residents of the area, and local historical and genealogical materials on file at the Robert E. Ellingwood Model Colony Room of the Ontario City Library.

FIELD SURVEY

On March 9, 2006, CRM TECH archaeologists Daniel Ballester and John J. Eddy (see App. 1 for qualifications) carried out the on-foot field survey of the project area. During the survey, Ballester and Eddy walked parallel north-south transects spaced 15 meters (approximately 50 feet) apart over most of the project area. In areas where such transects were not possible, such as around buildings or animal enclosures, a cursory survey was performed. In this way, the ground surface in the project area was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic periods (i.e., 45 years ago or older). Ground visibility ranged from poor to fair (0-70%) throughout the project area.

After the completion of the initial archaeological survey, on March 21, 2006, CRM TECH historical archaeologist Josh Smallwood (see App. 1 for qualifications) carried out a field inspection of all buildings in the project area and field recording procedures on those that appeared to be of historical origin (i.e., more than 45 years old). In order to facilitate the proper recordation and evaluation of these older buildings, Smallwood made detailed notations and preliminary photo-documentation of their structural and architectural characteristics and current conditions. Sixteen buildings which proved to be over 45 years old through further research were subsequently recorded on the State of California's standard site record forms and submitted to the AIC for inclusion in the California Historical Resource Information System (see App. 2).

RESULTS AND FINDINGS

PREVIOUS CULTURAL RESOURCES STUDIES IN THE VICINITY

According to records on file at the Archaeological Information Center, the project area had not been surveyed for cultural resources prior to this study, and no cultural resources had been recorded on the property. Outside the project boundaries but within a one-mile radius, AIC records show at least 12 previous cultural resources studies covering various tracts of land and linear features (Fig. 4). Despite these survey efforts, only one historical/archaeological site, P36-015980, was previously identified within the scope of the records search.

Site P36-015980 consists of the approximate route followed by Juan Bautista de Anza's historic overland expeditions of 1774-1776, which has been designated a California Point of Historic Interest (CPHI-SBr-027). No physical features associated with the de Anza expeditions were ever recorded along the route, and the exact location and course of the route are largely unknown. In the Ontario area, the site is represented by a commemorative marker in Anza Park, more than two miles northwest of the project location. Since no features associated with the site are known to exist in the project vicinity, P36-015980 requires no further consideration during this study.

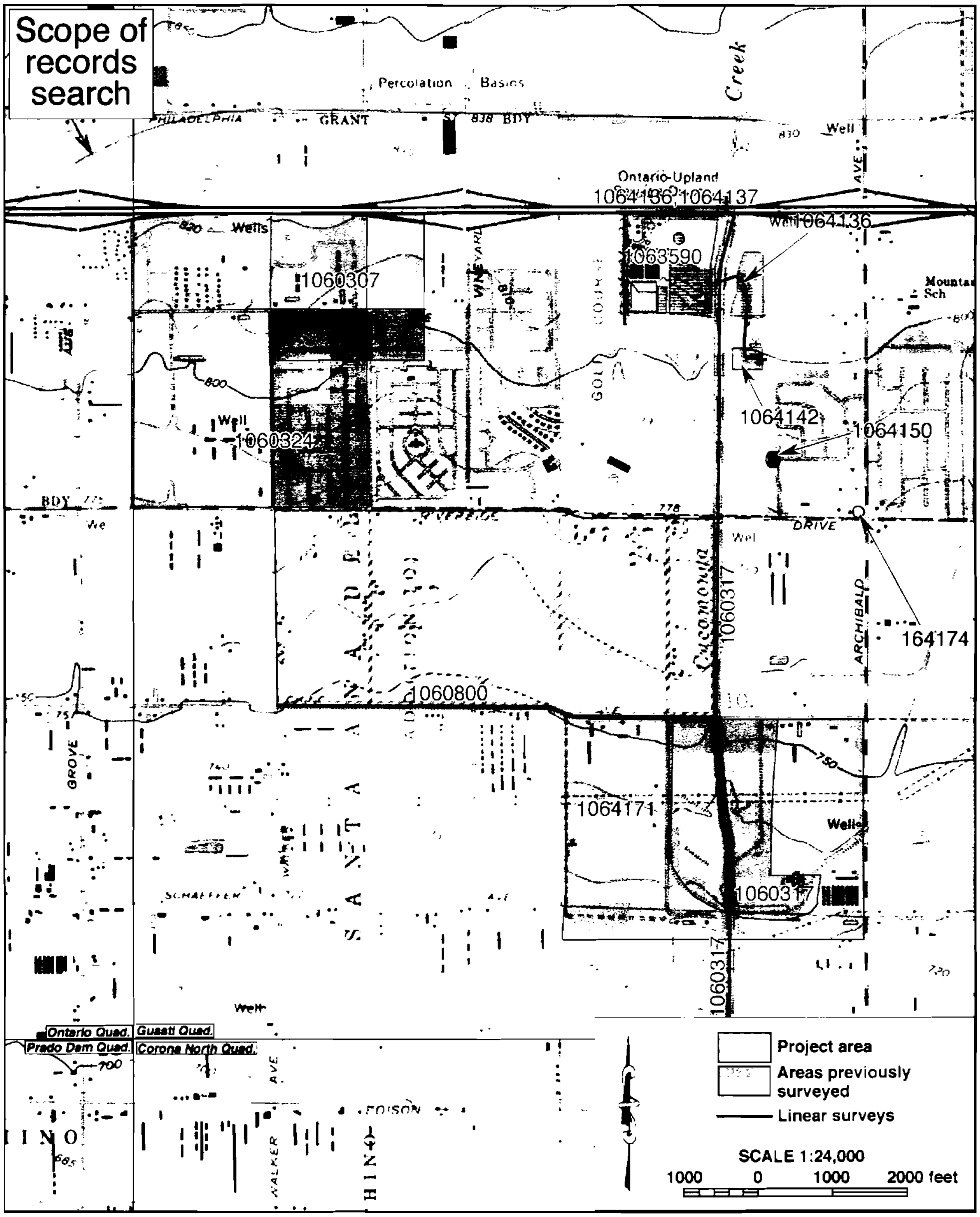

Figure 4. Previous cultural resources studies in the vicinity of the project area, listed by AIC file number. Locations of historical/archaeological sites are not shown as a protective measure.

HISTORICAL OVERVIEW OF THE PROJECT AREA

In 1878, when the U.S. government conducted the first official land survey in the Present-day Ontario area, no man-made features of any kind were observed in the eastern portion of the project area (Fig. 5). The western portion of the property, as a part of the privately held Rancho Santa Ana del Chino, was not surveyed at that time. Some 20 years later, after the land boom of the 1880s brought an influx of settlers into the San Bernardino Valley, the project vicinity reflected a cultural landscape that was typical of rural southern California at the time, featuring scattered farmsteads connected by an extensive network of roads (Fig. 6). Several roads were present by that time within or along the project boundaries, including the forerunners of today's Riverside Drive, Chino Avenue, and Ontario Avenue, and one building was noted in the easternmost portion of the project area, on the east side of present-day Ontario Avenue (Fig. 6).

By 1933, a number of buildings were in existence within the project boundaries, including at least nine along present-day Baker Avenue, two on the east side of Ontario Avenue, one on the north side of Chino Avenue, and two more near the intersection of Baker Avenue and Riverside Drive (Fig. 7). Archival records indicate that, beginning in the early 1940s, at least one significant agricultural interest was operating in the northeastern portion of the project area (County Assessor 1942-1948). Maj. Corliss Champion Moseley, a well-known aviation pioneer, and his family owned an approximately 80-acre parcel at that location between circa 1942 and 1945, and developed it into the Orange Blossom Dairy Farm, on which they assembled a prize-winning herd of Jersey cattle (anonymous 1942). The Moseley family's herd was reportedly the first officially classified Jersey herd in southern California, a designation that helped establish American standards and helped perpetuate the breed (*ibid.*).

By 1952-1953, a cluster of at least nine buildings was noted at that location, including six buildings identified as barns or sheds, presumably used for agricultural purposes (Fig. 8). Also at this time, several other apparent farming or dairy operations were found in the project area, as evidenced by the presence of other barns/sheds, an orchard along the northern project boundary, and a vineyard in the southeastern corner of the property (Fig. 8). Cucamonga Creek had by then been channeled, forming the eastern boundary of the project area (Fig. 8).

Dairy farming, a long-standing industry in the area since the turn of the 20th century that had grown at a steady pace over the years, exploded in the 1950s as urban encroachment in Los Angeles and Orange Counties during the post-WWII boom led to a "mass exodus" of dairy farmers to the Chino Basin. Between 1947 and 1955, the number of dairies in operation in the Chino Basin increased from approximately 60 to 135, with more under construction, making dairy farming the "biggest single economic factor in the Valley" (*Chino Champion* 1955). At least four dairies would eventually be established within the project area and remain in operation through recent times, including Bekendam and Hogg Bros. dairies on Baker Avenue and Knudsen, De Boer and, possibly, Pacific Coast dairies on Riverside Drive (Banbury 2006).

POTENTIAL HISTORICAL RESOURCES IN THE PROJECT AREA

During the field survey, no evidence of prehistoric—i.e., Native American—cultural resources was found within the project area. However, as mentioned above, more than 25

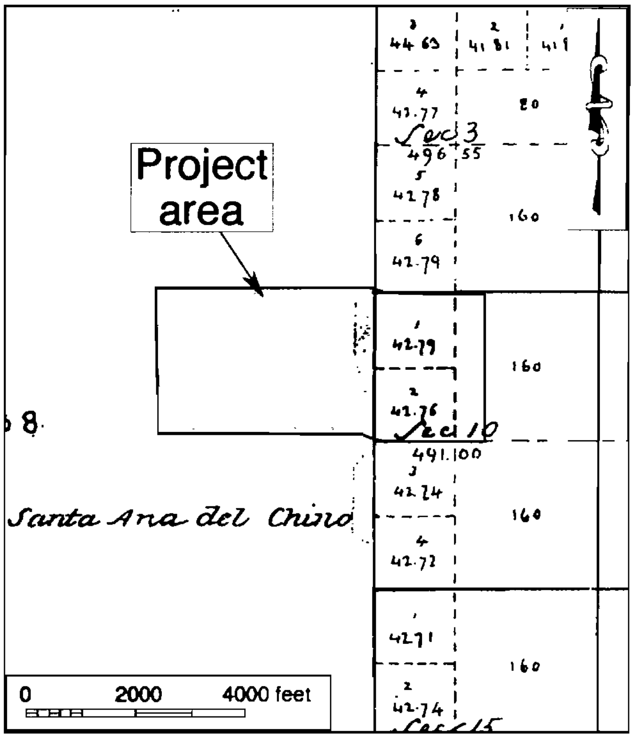

Figure 5. The project area and vicinity in 1878. (Source: GLO 1881)

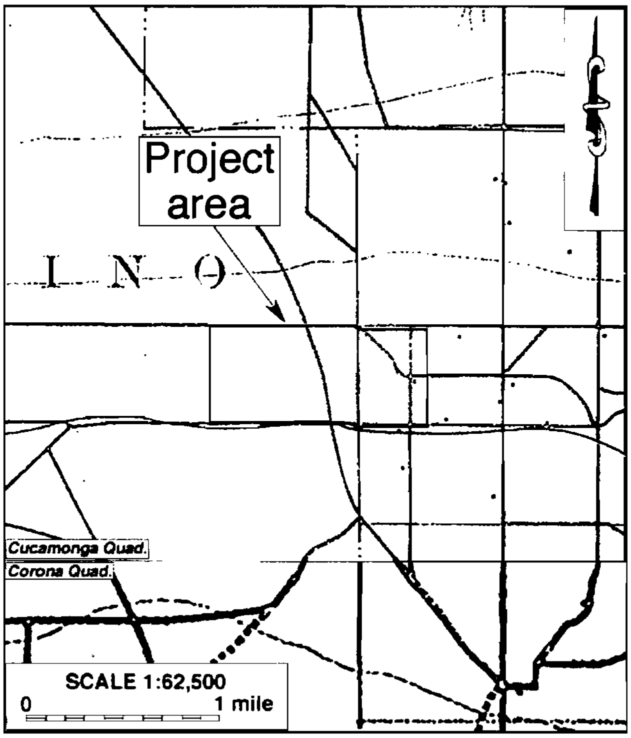

Figure 6. The project area and vicinity in 1894-1899. (Source: USGS 1902; 1903)

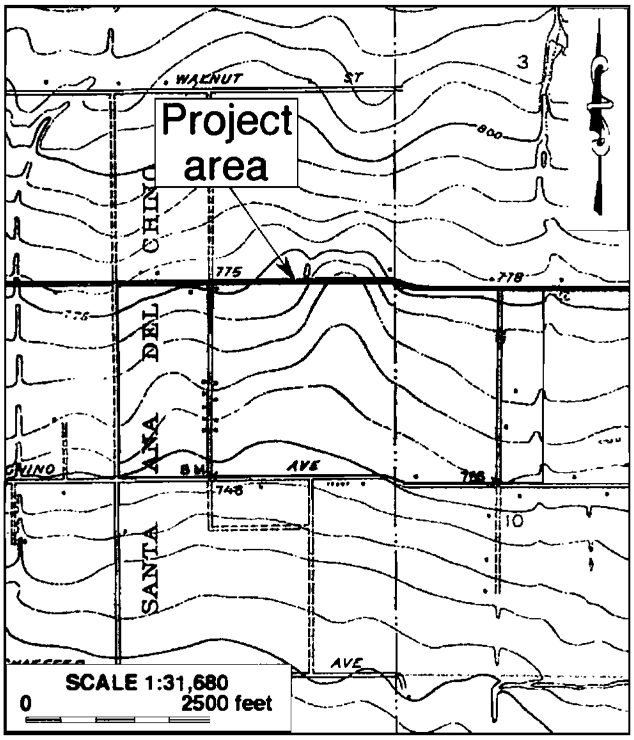

Figure 7. The project area and vicinity in 1933. (Source: USGS 1941)

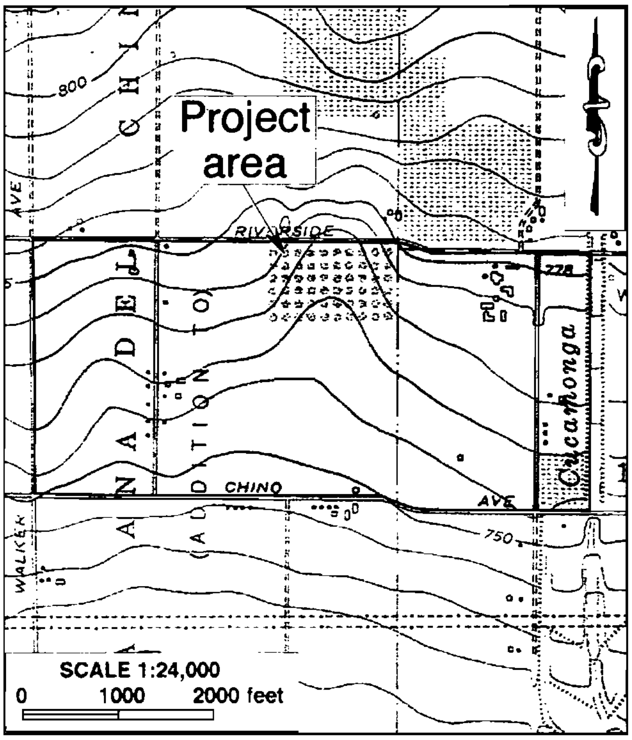

Figure 8. The project area and vicinity in 1952-1953. (Source: USGS 1953)

buildings are present throughout the project area, including mainly single-family residences but also multi-family farm worker's residences, dairy houses, and a number of ancillary structures such as barns and sheds. Among these, 14 single-family residences, a farm worker residence, and a dairy house evidently date to the 1950s or earlier, and were recorded during this study as potential historical resources.

Many of the other buildings and structures in the project area are determined to be of modern origin, and their appearance is characteristic of such buildings constructed on dairy farms in the Chino Basin area during the 1960s. Some of the ancillary structures are of indeterminate age, but demonstrate no particular historical characteristics. These buildings and structures were not recorded as potential historical resources.

The 16 buildings recorded during this study are listed below. Further information on these buildings is presented in the attached DPR 523 forms (see App. 2). The historic significance evaluation of these buildings is also discussed in the DPR 523 forms, and is summarized in the section below.

	Parcel No.	Address	Property Type	Const. Date
13229	0216-173-07	13100 Baker Avenue	Single-family residence	Ca. 1954-1960
13230	0216-173-07	13102 Baker Avenue	Single-family residence	Ca. 1954-1960
13231	0216-173-08	13104 Baker Avenue	Single-family residence	Ca. 1954-1960
13232	0216-174-02	13129 Baker Avenue	Single-family residence	Ca. 1947
13234	0216-173-06	8625 Riverside Drive	Single-family residence	1950s
13235	0216-173-06	8625 Riverside Drive	Dairy house	1950s
13236	0216-173-06	8657 Riverside Drive	Single-family residence	1950s
'3237	0216-173-09	13130 Baker Avenue	Single-family residence	Ca. 1954-1960
13238	0216-174-09	8715 Riverside Drive	Single-family residence	Ca. 1945
13239	0216-174-15	8815 Riverside Drive	Single-family residence	1950s?*
13240	0216-174-16	NO OUT 8821 Riverside Drive	Single-family residence	Pre-1945?**
13241	0216-174-16	8825 Riverside Drive	Single-family residence	1950s?*
13242	0218-102-11	9381A Riverside Drive	Single-family residence	Post-1945
13243	0218-102-11	9381B Riverside Drive	Farm workers' quarters	Post-1945
13243	0218-102-11	9381D Riverside Drive	Single-family residence	Post-1945
13244	0218-111-05	13165 Ontario Avenue	Single-family residence	Ca. 1949

* Moved to this location in the 1970s.
** Moved to this location sometime between 1966 and 1978.

Screwed up #'s

DISCUSSION

Based on the research results discussed above, the following sections present CRM TECH's conclusion on whether any of the historic-period buildings recorded during this study meets the official definition of a "historical resource," as provided in the California Public Resources Code, in particular CEQA.

DEFINITION

According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a)(1)-(3)).

Regarding the proper criteria of historical significance, CEQA guidelines mandate that "a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

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

EVALUATION

In summary of the research results discussed above, the historic-period buildings in the project area evidently date mostly to the post-WWII period. Buildings from that period survive in large numbers in the Ontario area and throughout southern California, and generally require outstanding historical, architectural, aesthetic, or other merits to be considered "historical resources," as defined above. These buildings demonstrate no such merits. The only building in the project area that may predate 1945, the residence at 8821 Riverside Drive, was evidently moved to this location at a much later time, and is of limited integrity to relate to the pre-WWII era.

Throughout the course of this study, no historical figures or events of recognized significance in national, state, or local history were identified in association with any of these buildings. One of the properties in the project area, a dairy farm located at 9381 Riverside Drive, was once owned by Corliss C. Moseley, a notable figure in American aviation history, between circa 1942 and 1945, and his Orange Blossom Dairy Farm evidently earned a level of distinction during the few years it was in operation at that location. However, all of the existing buildings on the property today appear to date to the post-1945 era, and none of them is known to be closely associated with Corliss C. Moseley or the Orange Blossom Dairy Farm.

In terms of architectural and esthetical qualities, the historic-period buildings recorded in the project area are generally plain and utilitarian in appearance and do not stand out as important or notable examples of their style, type, period, region, or method of construction, nor do they express any ideals or design concepts more fully than the numerous other buildings of similar vintage in the region. In addition there is no evidence that any of these buildings represents the work of a noted architect, designer, or builder.

Based on these considerations, the present study concludes that the 16 historic-period buildings recorded in the project area do not appear eligible for listing in the California Register of Historical Resources, and thus do not meet CEQA's definition of "historical resources," as outlined above.

CONCLUSION AND RECOMMENDATIONS

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

Since none of the historic-period buildings recorded in the project area meets CEQA's definition of a "historical resource," and since no other potential "historical resources" were encountered during the course of this study, CRM TECH presents the following recommendations to the City of Ontario:

- No historical resources exist within or adjacent to the project area, and thus the project as currently proposed will not cause a substantial adverse change to any known historical resources.
- No further cultural resources investigation is necessary for the proposed project unless development plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are discovered during any earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

REFERENCES

Anonymous
1942 Classifying of Herd Held. Clipping from unidentified newspaper, November 23. On file, "Dairies and Dairying" folder, Robert E. Ellingwood Model Colony Room, Ontario City Library, Ontario.

Banbury, Carolyn
2006 Personal communication with the authors. April 4.

Bean, Lowell John, and Charles R. Smith
1978 Gabrielino. In Robert F. Heizer (ed.): *Handbook of North American Indians*, Vol. 8: *California*; pp. 538-549. Smithsonian Institution, Washington, D.C.

Chino Champion, The
1955 Valley Pays Tribute to Thriving Local Dairies. June 16:1

City of Ontario
2001-2003 Building safety records, various addresses. On file, Building Department, City of Ontario.

County Assessor, San Bernardino
1942-1948 San Bernardino County real property tax assessment records; Book 120, Map 33, and Book 141a, Maps 26 and 27. On file, San Bernardino County Archives, San Bernardino.

GLO (General Land Office, U.S. Department of the Interior)
1881 Plat Map: Township No. 2 South Range No. 7 West, San Bernardino Meridian; surveyed in 1878.

McCawley, William
1996 *The First Angelinos: The Gabrielino Indians of Los Angeles*. Malki Museum Press/ Ballena Press, Banning/Novato, California.

USGS (United States Geological Survey, U.S. Department of the Interior)
1902 Map: Corona, Calif. (30', 1:125,000); surveyed in 1894 and 1899.
1903 Map: Cucamonga, Calif. (30', 1:62,500); surveyed in 1894.
1941 Map: Guasti and Vicinity, Calif. (1:31,680), surveyed in 1933.
1953 Map: Guasti, Calif. (7.5'. 1:24,000); aerial photographs taken in 1952, field-checked in 1953.
1969 Map: San Bernardino, Calif. (1:250,000); 1958 edition revised.
1979 Map: Santa Ana, Calif. (1:250,000); 1959 edition revised.
1981a Map: Corona North, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1978.
1981b Map: Guasti, Calif. (7.5', 1:24,000); 1966 edition photorevised 1978.
1981c Map: Ontario, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1981.
1981d Map: Prado Dam, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1978.

Stantec

CULTURAL RESOURCE ASSESSMENT
NEW MODEL COLONY EAST BACKBONE INFRASTRUCTURE

City of Ontario
San Bernardino County, California

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USGS Corona North and Guasti 7.5' Quadrangles

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Acronyms Used in the Text

AIC	Archaeological Information Center
BLM	Bureau of Land Management
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CNAHC	California Native American Heritage Commission
CPHI	California Points of Historical Interest
CRHR	California Register of Historical Resources
EIC	Eastern Information Center
GLO	General Land Office
LACM	Natural History Museum of Los Angeles County
MLD	Most Likely Descendant
NMC	New Model Colony
NRHP	National Register of Historical Places
RPA	Register of Professional Archaeologists
RPLI	Regional Paleontological Locality Inventory
SBBM	San Bernardino Base and Meridian
SBCM	San Bernardino County Museum
SHPO	State Historic Preservation Office
USGS	United States Geological Survey

INTRODUCTION

Stantec Consulting Inc. was retained by NMC Builders, LLC to conduct a cultural resources assessment for the proposed New Model Colony (NMC) East Backbone Infrastructure project in the City of Ontario, San Bernardino County, California (Figure 1).

The proposed project will include the widening and extension of several streets, bridge improvements and construction of bridges, construction of subsurface water, sewer, storm drain, and dry utilities, and improvements along the concrete-lined Cucamonga and Deer creek channels. Construction will involve excavations to depths ranging from 6 to 25 feet below current ground surfaces. The proposed project will include improvements within the 80- to 165-feet-wide rights-of-way of Riverside Drive and the following avenues: Archibald, Bellgrave (Merrill), Chino, Edison, Haven, Hellman (Ontario), Merrill (Eucalyptus), Mill Creek (Cleveland), Millikin (Hamner), and Schaefer. Proposed project components will be constructed mostly on dairy farm and agricultural land, and along developed and landscaped street rights-of-way. The alignments of the proposed project traverse through Sections 10, 11, 12, 13, 14, 15, 22, and 23, Township 2 South, Range 7 West, San Bernardino Base Meridian (SBBM), as depicted on the United States Geological Survey (USGS) 1967 Corona North and 1966 Guasti 7.5-minute quadrangle maps (Figure 2).

For the purposes of this report, "project" refers to the proposed backbone infrastructure construction. "Project area" refers to all land within the boundary of NMC East as shown in Figure 2. "Study area" refers to the project area and all land within a one-mile-wide zone around the project area boundary. "Project site" refers to the proposed construction footprint for the project. The project area and project site boundaries are depicted and addressed herein as proposed as of the date of this report.

The City of Ontario, lead regulating agency for the proposed project, requires this study as part of compliance with the California Environmental Quality Act (CEQA) (Public Resources Code, §21000 et seq.), CEQA Guidelines (California Code of Regulations, Title 14, §15000 et seq.), and the *City of Ontario Sphere of Influence Final Environmental Impact Report* (Envicom Corporation 1997).

This assessment is intended to provide the City of Ontario with the necessary information and analyses to determine whether or not the proposed project would significantly impact cultural resources as defined in CEQA Guidelines, to make recommendations for the conservation of cultural resources, and to recommend options for the mitigation of impacts to cultural resources.

The historical and archaeological study included a search of California Historical Resources Information System (CHRIS) maps, record forms, and technical reports, a search of the California Historic Bridges Inventory, a search of the California Native American Heritage Commission (CNAHC) sacred land file, a search of historical USGS maps and General Land Office (GLO) historical land patents, and a pedestrian survey of unpaved portions of the project site. The paleontological study included geologic map interpretation, a literature search, an institutional records search, and a review of previous paleontological investigations in the area and documented fossil-bearing localities, and a pedestrian survey of unpaved portions of the project site. Paleontological literature and records reviews were conducted by the San Bernardino

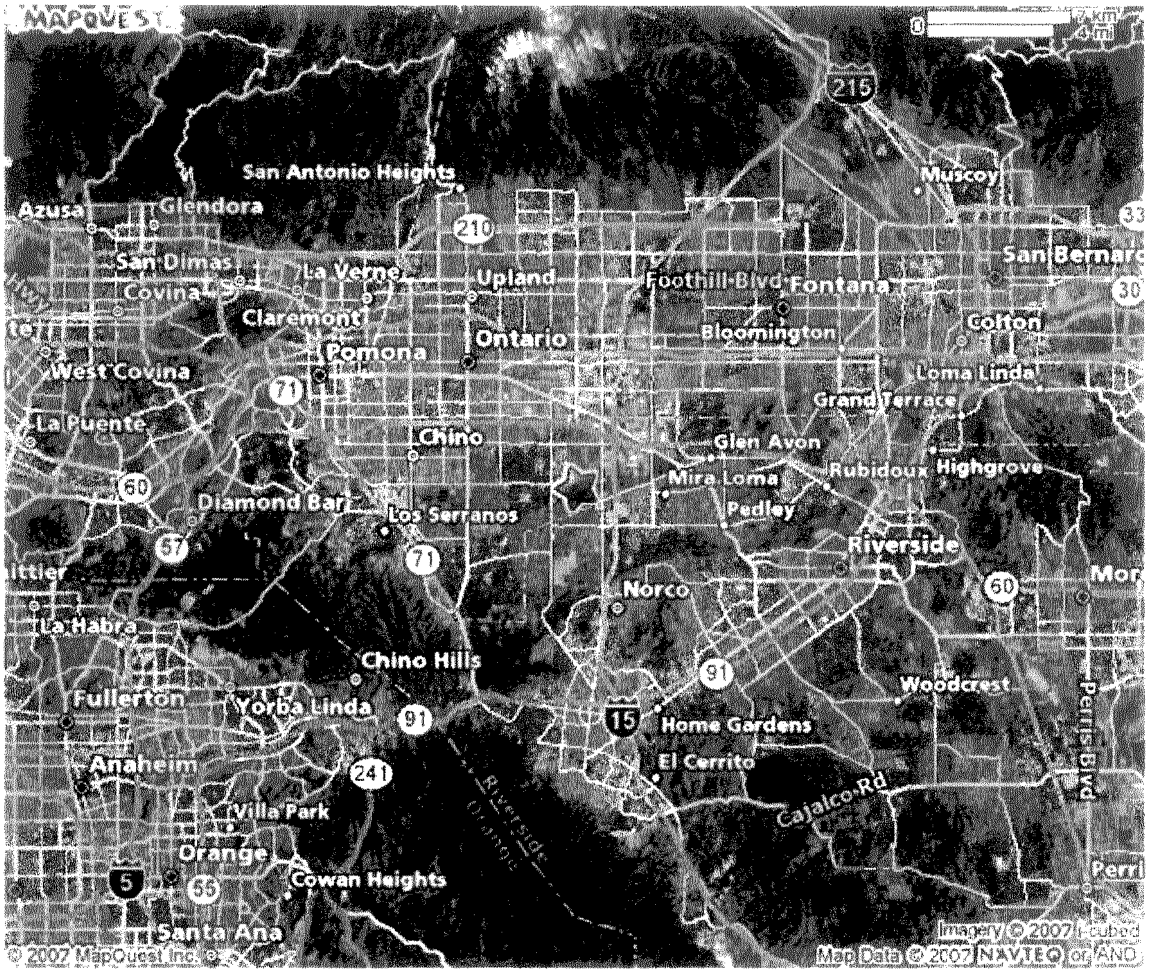

Figure 1. NMC East Backbone Infrastructure project location map.

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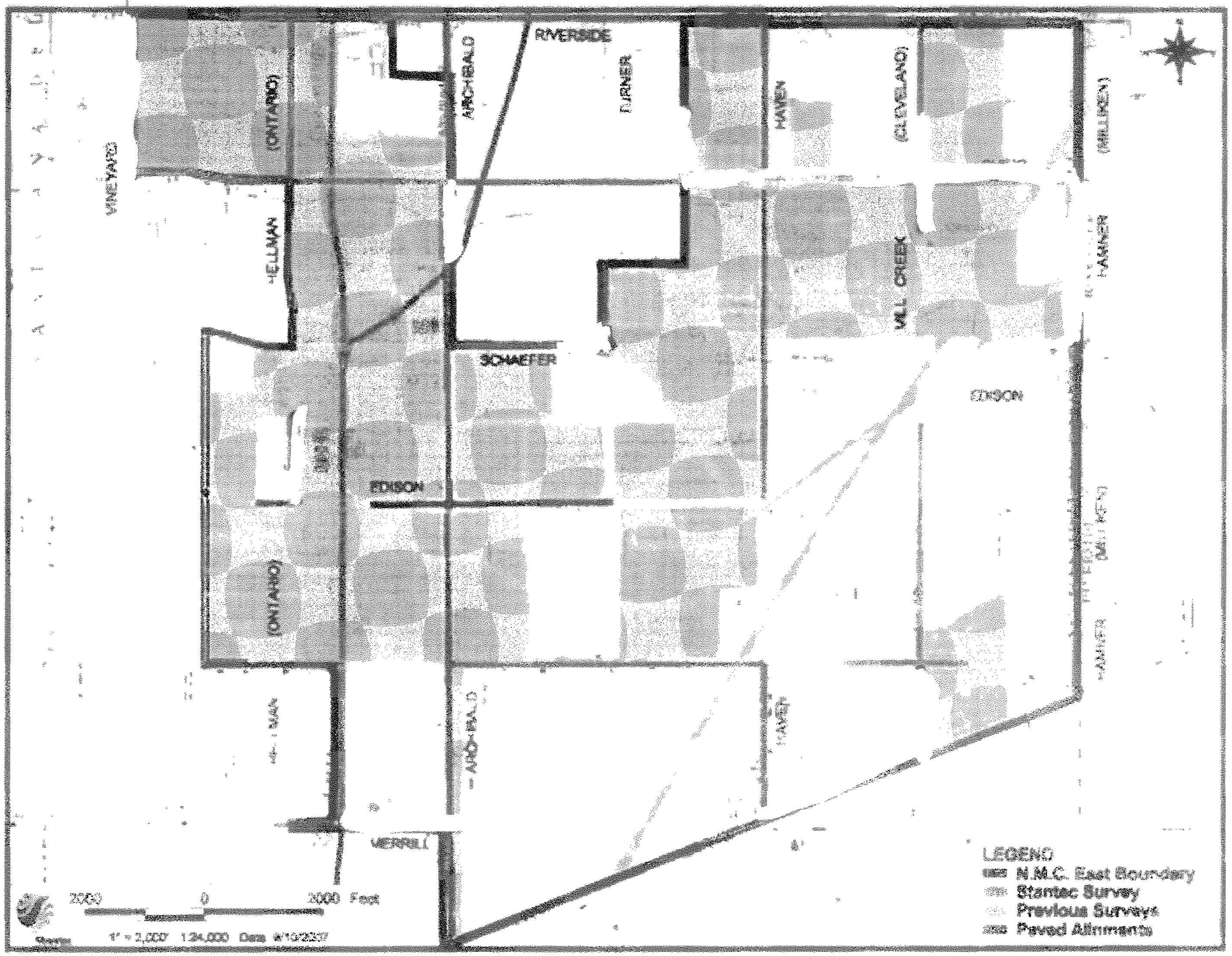

Figure 2. NMC East Backbone Infrastructure project area map

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County Museum (SBCM) and by the Natural History Museum of Los Angeles County (LACM). The studies were conducted by archaeologist Matthew Wetherbee, M.Sc., RPA, paleontologist Sarah Siren, M.Sc., and principal archaeologist Gavin Archer, MA, RPA (see Appendix A for statements of qualifications).

The results of the records search indicate that one significant Historic Period cultural resource, the Juan Bautista de Anza National Historic Trail (CPHI number SBr-027, CHRIS site number 36-015980), crosses the northern portion of the project site just south of Riverside Drive, but the exact location of the trail is unknown. Recent land development in the area has likely destroyed all physical traces of the trail in the study area. Several historical land patents including land within the study area and dated between 1869 and 1891 were identified. Any buildings located on the project site during that time period would have been removed by subsequent land use activities. In addition, historical maps indicate that several Historic Period buildings were formerly located in the study area but not within the project site boundaries. The CNAHC staff searched the sacred land file and reported no Native American cultural resources in the study area. Paleontological records indicate that no known paleontological resources are located within the study area.

This study identified one extant Historic Period building within the project site boundaries, but it does not to meet the CEQA Guidelines definition of a "historical resource." No other buildings, other structures, or objects more than 45 years old were encountered during the pedestrian survey. In summary, no significant historical, archaeological or paleontological resources were identified by this study within or adjacent to the project site.

Based on the results of this study, the project will not impact known historical resources or unique archaeological resources as defined by CEQA Guidelines. The project site is unlikely to include buried and undiscovered historical resources or unique archaeological resources. The project site may, however, include buried and undiscovered paleontological resources. Paleontological monitoring is recommended to ensure that significant paleontological resources unearthed by construction, if any, are protected, salvaged, and placed with a suitable museum. Earth-moving activities in fossiliferous sediments should be observed full-time by a paleontological monitor. If archaeological deposits are encountered during construction, earth-moving activities should halt in the immediate area of the find. Archaeological finds should be evaluated by a qualified archaeologist. Archaeological finds meeting CEQA Guidelines definitions of historical resource or unique archaeological resource should be preserved in place or the subjects of data recovery programs. In addition, California State Health and Safety Code Section 7050.5 dictates that if human remains are unearthed during construction, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98.

Natural Setting and Built Environment

The study area is situated in a region currently dominated by agriculture, especially the dairy industry in the western San Bernardino Valley. The nearest natural water source, the Santa Ana River, lies four miles south of the project area. The San Gabriel Mountains are located approximately 10 miles to the north. The terrain of the study area is relatively level, with the elevations ranging approximately 650 to 750 feet above mean sea level. Recent (Holocene; 10,000 years or younger) quaternary fan and eolian (sand dune) deposits underlie the study area (McLeod 2006; Scott 2006).

The project area is generally bounded by Riverside Drive on the north. the Riverside/San Bernardino County line on the south, Milliken (Hamner) Avenue on the east, and Vineyard Avenue on the west. Several of the project site alignments lie adjacent to agricultural fields and active dairy farms, and exhibit such features as barns, cow pens, metal canopies, pasture land, dairy rinse water and runoff retention ponds, and a number of small associated buildings and sheds. In addition, several single-family residences, ancillary buildings, and other buildings including Fuji Natural Foods and the Archibald Ranch Community Church were also noted near the alignments. Portions of the project site traverse a number of existing paved streets including Archibald Avenue, Chino Avenue, Edison Avenue, Hamner Avenue, Haven Avenue, Merrill Avenue, and Riverside Drive. Cucamonga Creek flows in a north-south direction on the western side of the project area. Bridges included in the planned improvements are located at Cucamonga Creek crossings on Chino Avenue, Edison Avenue, Merrill Avenue, and Riverside Drive. New bridges will be constructed at Cucamonga Creek crossings for Eucalyptus Avenue and Schaefer Avenue.

The dairy and agricultural operations as well as the more recent land developments and mechanical disturbances have extensively altered the natural landscape in the project area. As a result, traces of native terrain and vegetation are sparse in the project area. Non-native vegetation consists of landscaping plants (lawns, flowers, trees, bushes and small grasses and shrubs) and crops. The planned new alignments of Bellgrave (Merrill) Avenue, Chino Avenue, Edison, Hellman (Ontario) Avenue, Merrill (Eucalyptus) Avenue, Mill Creek (Cleveland) Avenue, and Schaefer Avenues, and new underground utility alignments pass through dairy and farm land. Portions of the proposed alignments which cross Dick Dykstra Dairy Farm and other private property were not surveyed in the field as part of the investigations for this assessment.

Cultural Setting

Prehistoric and Protohistoric Context

The study area lies on the eastern edge of the traditional territory of the Gabrielino, a Takic-speaking group who were second only to their Chumash neighbors in being the wealthiest and most populous Native American group in southern California (Bean and Smith 1978:538). These people are thought to have migrated from the Great Basin area and moved westward toward the coast between A.D. 500 and 1,000, or 1,000-1,500 years ago, slowly replacing the indigenous Hokan speakers (Chartkoff and Chartkoff 1984:186). The Gabrielino territory reached from the present-day San Bernardino Valley and Riverside areas to the coast where it flourished in the current Orange County and Los Angeles areas, as well as across the channel to San Clemente, San Nicolas, and Santa Catalina islands. Archaeological evidence further indicates that their cultural influence reached as far as the San Joaquin Valley, the Colorado River, and Baja California. The Gabrielino controlled valuable steatite outcrops on Santa Catalina Island. Steatite is soft soapstone ideal for producing animal carvings, pipes, ritual objects, ornaments, and cooking utensils. The Gabrielino traded steatite and steatite artifacts extensively with neighboring groups (Bean and Smith 1978:542). Unfortunately, the Gabrielino cultural practices are not well documented as they declined before ethnographic studies were conducted.

Like many other aboriginal groups in southern California, the Gabrielino were hunter-gatherers who settled primarily near permanent water sources or in the forest transition zone. Bean and Smith (1978) characterize this range as the "Interior Mountains/Adjacent Foothills" zone of the Gabrielino culture. The interior mountains and foothills comprise an area of numerous subsistence resources including small mammals, acorns, and a variety of other plant and animal foods (Bean and Smith 1978:528). The coastal regions also provided a variety of food resources including various shellfish, sharks, rays, fish, sea mammals, waterfowl, and offshore kelp beds. Men were responsible for the hunting, fishing, and assisting in some gathering activities, conducted most trading ventures, and provided for the ceremonial and political well being of their families and homes (*ibid.*:546). Women were responsible for collecting and preparing food resources and the production of baskets, pots, and clothing. The intricacies of Gabrielino social organization are unknown; however, studies suggest that a moiety system similar to that of other southern California Takic speakers existed (*ibid*: 543). Villages were politically autonomous, composed of non-localized lineages, often segmentary in nature, and were under the leadership of a single chief (*ibid*: 544). The arrival of the Spanish explorers and the establishment of missions and outposts during the late 18th century ended the Prehistoric Period in California.

Contact with Europeans may have occurred as early as 1542 with the Spanish expedition of Juan Rodríguez Cabrillo. It is difficult to determine the size of the population at the time of European contact; however, possibly more than 50 or 100 mainland villages were inhabited simultaneously with an average population in each village of 50-100 persons (Bean and Smith 1978: 540). It was not until the 1770s that Spaniards began to slowly colonize the Gabrielino territory, subsequently resulting in the incorporation of most Gabrielino into the Mission San Gabriel and other missions in southern California. Europeans brought not only a new religion and way of life, they also introduced a host of diseases and dietary deficiencies resulting in a decline of the Gabrielino population. The decline of the Gabrielino population was extremely severe and by the 1900s they had almost ceased to exist as a culturally identifiable group (Bean and Smith 1978:540). However, in recent decades, there has been a renaissance of Native American activism and revitalization among several southern California Native American groups including the Gabrielino.

Historic Period Context

The first European explorers arrived in the San Bernardino Valley as early as 1772, but the area was later claimed by Spain in the late 1800s. However, the hot, arid inland valley was not the first choice of settlement as the Pacific Coast provided much more abundant resources, as well as harbors. The Mission San Gabriel was established in 1771 and the San Bernardino Valley came under control of the mission. Soon after, the area received the name "San Bernardino" when a mission rancho bearing that name was established at the eastern end of the valley.

In the 1830s, a trade route known as the Spanish Trail was established between southern California and New Mexico. Traders from New Mexico traveled for two months and traversed rough terrain carrying goods on mules and horses to trade for California goods. The San Bernardino Valley served as an excellent pasturage for the livestock of the trading expeditions. The mission system was dismantled in 1834 through a process of secularization after the Mexican government gained its independence from Spain in 1821. In the following years, the Mexican government acquired the former mission ranchos, and divided and granted them among prominent citizens of the province. One of the largest grants in the area was the Rancho Santa Ana del Chino, located just south of the project area. In 1848, with the U.S. annexation of Alta California, the San Bernardino area received a slow migration of American immigrants. However, it was not until the completion of the Southern Pacific Railroad and the Santa Fe Railroad in 1880, and offshoot of the Central Pacific, that a land boom swept across all of southern California and a number of towns surrounded by irrigated farmland were laid out in the San Bernardino Valley.

Among the several towns established in the area were Etiwanda and Ontario, both founded by local developer and Canadian immigrant George Chaffey. One of the keys to Chaffey's success as a developer was his creation of a "mutual water company" in which each landowner became a stockholder. With these improvements laid out, Chaffey made water available to every parcel of land. By the 1890s these two colonies flourished with the rise of the citrus and dairy industries, and set the example for other towns in rural southern California. Not only were citrus fruits a main commodity, but olives and grapes were grown as well. The City of Ontario was incorporated in 1891 and has experienced continual slow growth of settlement since that time. This agricultural land has been farmed primarily by Dutch, French Basque, and Portuguese dairy farmers in the last 50 years.

The dairy industry moved into the Chino Valley in three distinct phases. The three phases include: 1) the pre-1930 establishment of rural residential and free-grazing dairy properties; 2) the 1930-1940 dry lot dairying with mechanization phase; and 3) the post-1950 establishment of scientific, large-capacity dairies. The earliest phase occurred between 1900 and 1930 and involved the free grazing of cattle located on lots smaller than nine acres that were likely located near Riverside Drive or Euclid Avenue and other streets in the near vicinity. During the second wave of dairies, the lot sizes remained small, but eventually grew in size by the end of this era in terms of acreage, multiple dairy generations, and more cattle occupying each lot. By 1950 and beyond, dairy farms were much larger and often encompassed many parcels totaling 40 acres or more and mechanization had become a large part of the operations.

By the 1950s, Ontario was experiencing a massive post-war housing boom along with the rest of southern California. The decline in agricultural land spurred the San Bernardino Board of Supervisors in 1967 to designate 14,000 acres of agricultural land located south and west of the City of Ontario as an "agricultural preserve." By the 1980s, this area had become a world-class dairy area. However, escalating dairy operation costs and another housing boom caused the long-term agricultural uses of these lands to be forfeited and thousands of acres were annexed to the City of Ontario, City of Chino Hills, and the City of Chino. Ontario named its portion of the former San Bernardino Agricultural preserve the "New Model Colony," after the original "Model Colony of Ontario" established by the Chaffey brothers in 1882.

RESEARCH DESIGN

The initial objective of this assessment is to identify cultural and paleontological resources on and near the project site using records and a pedestrian survey. Available records include CHRIS maps, site forms, and technical reports, the California Historic Bridges Inventory, the CNAHC sacred land file, historical USGS maps, and GLO historical land patents. Archival research was conducted to gather information on possible prehistoric and historical buried remains on the project site. The pedestrian survey was undertaken to meet current standards for identifying cultural resources with visible surface manifestations on the project site.

In the region, most cultural resources are archaeological sites associated with prehistoric, protohistoric, and historical Native American occupations. They may also be associated with historical Europeans and European Americans who explored and settled in the area. Cultural resources are usually material remains more than 50 years old. Although rare, more recent buildings, such as dairy farms and their associated structures and other man-made features can be cultural resources. Non-material cultural resources, such as places and natural features considered sacred by Native Americans, and traditional Native American resources (e.g. plants used in traditional basketry) are also possible.

As summarized above, the prehistoric Native Americans who occupied the area were the Gabrielino. Prehistoric and Historic Period archaeological remains that are identifiable by pedestrian survey typically include artifact scatters on the surface. The most common Native American artifacts found during pedestrian surveys include chipped-stone debitage and tools, ground-stone tools, and pottery sherds. Features, such as fire-cracked rock clusters, may also be identified during pedestrian surveys. Historic Period artifacts most commonly consist of glass bottle, can, and ceramics fragments. Features, such as structural remains (e.g. house foundations), are also possible. Historically important sites may not have material remains, but can be identified using historical maps and records. Sacred land and other traditional cultural places may or may not have physical components, but can be identified in consultation with Native Americans based on oral history and traditional knowledge.

METHODS

The tasks performed for this study consisted of those recognized as standard professional practices for cultural resource management studies conducted for compliance with the CEQA. The goals and objectives of this assessment included the identification of all known cultural resources in the study area and cultural resources evident by physical manifestations on the project site in unpaved portions. The purpose of the study is to provide recommendations for planning and project impacts mitigation to the City of Ontario. This report closely follows State Historic Preservation Office (SHPO) guidelines (COHP 1990).

California Historical Resources Information System Records Search

The CHRIS was established and is maintained under the auspices of the SHPO. The CHRIS records search included the project area and a one-mile-wide (1.61-kilometer-wide) zone around the project area (i.e. the study area). The study area lies on the boundary between Riverside and San Bernardino counties, and the CHRIS records search included records on file at the CHRIS Eastern Information Center (EIC) at the University of California, Riverside, and at the CHRIS Archaeological Information Center (AIC) at the San Bernardino County Museum, Redlands. The EIC and AIC are the CHRIS repositories for Riverside County and San Bernardino County, respectively.

Historical and archaeological site record forms, site location and site boundary maps, and technical reports resulting form previous studies for proposed projects in the study area were reviewed. Previously identified historical and archaeological resources may include, but are not limited to, California Historical Landmarks, California Points of Historical Interest (CPHI), San Bernardino County Historical Landmarks, sites listed on the California Register of Historical Resources (CRHR), and sites listed on the National Register of Historic Places (NRHP).

California Historic Bridges Inventory Search

Four bridges are present on the project site. They were inspected in the field to obtain California Department of Transportation ("Caltrans") bridge numbers. A search of the California Historic Bridges Inventory (Caltrans 2003) was conducted to determine if they are listed as historical resources.

Sacred Land File Search

A request for a sacred land file search was initiated on July 13, 2007 with the Native American Heritage Commission to identify recorded sacred sites and other cultural resources within or near the study area, and to obtain contact information for local Native American consultants.

Historical Maps and Land Patents Search

Historical maps consulted during this study were found in published literature on local and regional history and in the archival records of the County of San Bernardino. Among the maps consulted were a GLO land survey plat map dated 1881, and USGS topographic maps dated 1902-1903, 1941-1942, 1953-1954, and 1966-1967. In addition, GLO historical land patents were searched (BLM n.d.).

Paleontological Records Search

The paleontological records search included geological maps and literature, reports of previous paleontological investigations in the study area, and documentation of fossil-bearing localities. Museum records searches and a search of the Regional Paleontological Locality Inventory (RPLI) were requested from Dr. Eric Scott of the SBCM and Dr. Samuel McLeod of the LACM.

Pedestrian Survey

The pedestrian survey was carried out on July 6, 2007, and September 6, 2007, by archaeologist Matthew Wetherbee, MA, RPA, paleontology technician Rachael Mills, B.Sc., and archaeology technician Ryan Taft, BA. It covered unpaved road rights-of-way on the project site. During the survey, the field crew walked parallel, 15-meter-wide (ca. 50-feet-wide) transects to fully cover proposed project alignments, where accessible, and which measure 80 to 165 feet in width. The ground surface was examined for material evidence of human activities dating to the prehistoric or historic periods, and for visible evidence of paleontological resources such as fossils and fossil-bearing geologic formations. The coverage of the pedestrian survey was constrained by limited access in some areas due to the presence of livestock, extant residences, and other modern, man-made features. Most of the land was covered by dairy by-products, agricultural fields, and developed landscape, and visibility of the native soil ranged from extremely poor (0-20 percent) in developed areas and areas covered with dense ground vegetation, to good (90 percent) in vacant areas.

RESULTS

California Historical Resources Information System Records

According to records on file at the EIC and AIC, 25 cultural resource studies have been previously conducted in the study area including on portions of the project site (Dice 2004, 2006; Dice and Irish 2002; Foster and Greenwood 1985; Fulton 2003; Hearn 1979; Hogan and Tang 2006; Love et al. 2001; Marken et al. 2006; Martz 1976; Maxwell 2001; Pollock 2006; Sander et al. 2004, 2005a, 2005b, 2005c; SBCM 1978; Scott and Gust 2005; Tang et al. 2002, 2004, 2006a, 2006b, 2007; Wetherbee 2007; Wetherbee and Siren 2006;). All but one of these studies consisted of cultural resource records searches and pedestrian surveys on various tracts and corridors of land within the study area. One study consisted of archaeological monitoring of construction grading along Archibald Avenue. As a result of these studies, one Historic Period roadbed and one Historic Period trail (Table 1), seven Historic Period structures (Table 2), and two prehistoric isolates (Table 3), were identified within the study area.

Table 1. Summary of Historic Period Roadbed and Trail in the Study Area

CHRIS Site Number	Description	CRHR Eligible?
36-012533	Roadbed made of Historic Period debris	No
36-015980	Juan Bautista de Anza National Historic Trail (CPHI SBr-027)	Yes

Table 2. Summary of Historic Period Structures in the Study Area

Parcel Number	Address	Building Type	Construction Date	CRHR Eligible?
0218-111-29	9586 Chino Ave.	Single Family Residence	ca. 1920-1930	No
0218-191-22	9490 Archibald Ave.	Single Family Residence	1915	No
0218-191-24	9203 Edison Ave.	Fencing	1923	No
0218-191-04	13990 S. Archibald Ave.	Single Family Residence	1920	No
0218-191-14	13838 S. Archibald Ave.	Barn/Stables	1940	No
0218-201-18	13923 S. Archibald Ave.	Farm Complex	ca. 1920	No
N/A	14355 Archibald Ave.	Single Family Residence	ca. 1940-1950	No

Table 3. Summary of Prehistoric Isolates in the Study Area

Isolate Number	Description
P-1	Basalt flake
P-2	Mano fragment

The Historic Period roadbed (36-012533) was found during archaeological monitoring on Archibald Avenue between Merrill Avenue and Chino Avenue. The roadbed feature consisted of crushed brick, glass, ceramics, and other refuse items, reportedly from salvage and clean-up operations from the City of Long Beach after the earthquake of 1933 (Hogan and Tang 2006). Despite extensive research and inquiries to the City of Long Beach Historic Preservation Officer, no definitive historical documentation has been found to substantiate that claim (*ibid.* 2006). While the 1933 Long Beach earthquake may be considered an important event in local and regional history, the site does not demonstrate a particular close association-or any documented association-with that event (*ibid.* 2006). The debris and refuse found during the monitoring program had poor archaeological integrity and little potential to yield important information for the study of local and regional history (*ibid.* 2006). Site 36-012533 does not meet the definition of a historical resource as defined by CEQA Guidelines.

The Juan Bautista de Anza National Historic Trail (CHRIS site number 36-015980; CPHI SBr-027) which has been documented as traversing the northern portion of the project site just south of Riverside Drive, but the exact location is unknown. Recent development has most likely destroyed any physical evidence of this historic trail in the study area. None of the previous studies were able to locate any physical evidence of the historic trail. A marker, located in the study area but outside of the project site boundaries, was erected to commemorate the Juan Bautista de Anza expedition of 1774.

The seven Historic Period structures identified in the study area consist of single-family residences, barns and other dairy/farm structures, and fencing that date from the early- to mid-20th century. Previous studies indicate that, even though all of the strutures appear to be at least 50 years of age, they were found not historically significant and not eligible for listing on the CRHR. In addition, several of the reports listed above indicate that a number of modern residences (built post-1950) were also noted in the study area.

The two prehistoric isolates identified in the study area were located west of Cucamonga Creek and south of Edison Avenue. The areas of the finds were surveyed using close interval pedestrian transects in an effort to identify additional artifacts, but no other artifacts were found. The report indicates that the areas of the finds have been extensively disturbed by both natural processes and agricultural activities. Three-feet-deep disturbance was estimated and it was noted that any artifacts on the surface or to a depth of three feet in these areas are likely not in their original context (Marken et al. 2006).

All of the sites, structures, and isolates identified in the study area by previous studies were evaluated as part of those studies. Other than the Anza Trail, none were considered eligible for the CRHR. Based on the results from these studies, there is little potential for buried and undiscovered, significant cultural resources on project site. The previous studies covered only portions of the project site, and pedestrian survey of the remaining, unpaved portions was included in this study (see below). Cultural resource site records, which include confidential site location descriptions and maps, are not included in this report per CHRIS policy, but they are on file at the EIC, the AIC, and Stantec.

California Historic Bridges Inventory

Table 4 provides a list of bridges on the project site and their eligibility for the NRHP. As noted above, two new bridges will be constructed on Schaefer and Eucalyptus avenues and they are not, therefore, in the Caltrans Historic Bridges Inventory at this time. The four extant bridges were constructed in 1979 and are not eligible for the NRHP. Similarly, they are not CRHR eligible.

Table 4. Summary of Extant Bridges in the Study Area

Number	Location	Date of Construction	NRHP or CRHR Eligible?
54C0528	Riverside Drive	1979	No
54C0529	Chino Avenue	1979	No
54C0531	Edison Avenue	1979	No
54C0532	Merrill Avenue	1979	No

Sacred Land File

A request was made to the CNAHC for a search of the sacred land file. A response was received on July 18, 2007, from the CNAHC that a search of their file failed to indicate the presence of Native American cultural resources in the area. It was also noted that this absence of information in their files does not indicate an absence of cultural resources in any project area. The CNAHC's letter report and list of potential Native American informants is provided in Appendix B.

Historical Maps and Land Patents

Historical sources consulted for this study suggest that in the late 1870s, shortly before George Chaffey founded the community of Ontario, no man-made features were present in the study area (GLO 1881; T2S R7W). Two decades later, after Ontario became incorporated, early settlers began settling in the area and this is reflected by several scattered farmsteads connected by an extensive network of roads shown on maps made at the beginning of the 20th century (USGS Corona 1902; Cucamonga 1903). By 1933, several of the present-day roads including Archibald Avenue, Chino Avenue, and Edison Avenue were established, and dairy and other agricultural operations continued to expand in the study area (USGS Guasti and Vicinity 1941; Corona and Vicinity 1942). Several structures shown on the 1940s maps were located along a number of project site roads. Over the next 20 years, the Ontario area continued to experience considerable growth as dairy farming, a long-standing industry in the area, boomed in the 1950s with a significant increase in the number of dairies in the study area shown on 1950s maps (USGS Corona North 1954; Guasti 1953; Ontario 1954).

GLO records pertain to initial transfers of land from the federal government to other parties. The records indicate that 13 patents pertaining to land within the study area were issued between 1869 and 1891. The first two patents issued for land in the study area were issued in for Spanish/Mexican grant land to Issac Williams, in 1869, and to Juan Bandini in 1879. The third patent for land in the study area was issued in 1879 to the Atlantic and Pacific Railroad. Between 1885 and 1891, with the land boom occurring in the Ontario area, several plots of land were acquired by early settlers including John F. Watkins, John Doyle, Philip O'Brien, Cyrus Willard, and Archie McDougall by cash sale. In 1880, Samuel A. Bishop, C. E. Deforst, and George Johnson acquired pieces of land by scrip or Nature of scrip. Finally, as a result of the Homestead Act of 1862, George W. Ingram and James I. Roach each acquired 165-acre pieces of land within the study area in 1890 and 1891, respectively.

Paleontological Records

According to paleontological records on file at Stantec, the LACM, and the SBCM, no known vertebrate fossil localities are present within the study area (McLeod 2006; Scott 2006). Dr. Eric Scott (2006) determined that the geology of the surficial Holocene fan and wind-blown sand deposits within the study area should be assigned a rating of low paleontological sensitivity. Underlying older Pleistocene deposits may be present at an unknown depth below the surface. These deposits have a high probability of including significant vertebrate fossils and have yielded *Mammuthus* (mammoth) fossils 3.5 miles northeast of the project area (SBCM locality 5.1.8; Scott 2006) (Appendix C).

Shallow (e.g. upper three feet), younger Quaternary deposits across the project area have not yielded significant vertebrate fossils and are not paleontologically sensitive (McLeod 2006). However, older Quaternary deposits occur at the surface west and south of the project area, these deposits having a high probability of including significant vertebrate fossil remains. A fossil specimen of deer (*Odocoileus*) was found in locality LACM 1207, due south of the project area, between the cities of Corona and Norco in older Quaternary deposits (McLeod 2006) (Appendix C).

Pedestrian Survey

No surface evidence of prehistoric or Historic Period archaeological sites, features, or artifacts, or fossils was found in the surveyed areas. Some segments of the project site are currently private dairy and other agricultural land, and right-of-entry was not granted at the time of the pedestrian survey. They are excluded from the current study. Where right-of-entry was available, the pedestrian survey was completed using 15 meter spacing between surveyors.

One extant building on the project site, a house located at 9572 Merrill Avenue, was constructed more than 45 years ago (Figure 3). According to a grant deed on file at the San Bernardino County Assessor's office, the residence dates to 1956. It is typical of many extant houses in the Ontario area which were built during the post-World-War-II construction boom. The results of records research do not indicate that it is associated with significant historical events or persons, and it is not architecturally distinctive, and it does not have potential to yield important historical information. The building does not meet CRHR eligibility criteria and it is not a historical resource as defined by CEQA.

Figure 3. Building located at 9572 Merrill Avenue.

Additionally, segments of the proposed project alignments traverse landscaped areas, the parking lot of Fuji Natural Foods located at 13500 Milliken Avenue, and the adjacent Southern California Edison property located at 13568 Milliken Avenue. The Dick Dykstra dairy farm located at 10129 Schaeffer Avenue and a number of ancillary buildings and structures associated with dairy farming operations were identified on or adjacent to the project site. These buildings and other structures were built prior to the 1950s and represent vernacular architecture. Since they are modern and are not architecturally significant, they do not require further consideration as potential cultural resources.

A fair amount of modern trash was also observed on the project site, including machinery, metal fragments/debris, and refuse associated with the dairy operations. None of these items was of any historical or archaeological interest. Many segments of the project site have been heavily disturbed by off-road vehicles, agricultural, landscaping, and construction activities associated with the various public roadways and utility lines (Figure 4). During the field survey, no fossils were observed on the surface exposures of Recent sandy alluvium.

Figure 4. Representative views of existing street alignments. Clockwise from upper left: west side of Archibald Avenue (view to south); southwest corner of Archibald Avenue and Chino Avenue intersection (view to south); Schaeffer Avenue (view to east); south side of Merrill Avenue (view to south).

MANAGEMENT CONSIDERATIONS

The project would not cause a substantial adverse change in the significance of any known historical resources or unique archaeological resources as defined by CEQA Guidelines. The project would not disturb any known human remains including those interred outside of formal cemeteries. The project would not directly or indirectly destroy any known unique paleontological resources or sites, or unique geologic resources as defined by CEQA Guidelines. The project would have potentially significant impacts on cultural resources because buried and undiscovered historical resources, unique archaeological resources, human remains, unique paleontological resources or sites, and unique geologic resources may be present within the boundaries of the project site, and they may be unearthed, disturbed, and destroyed by construction excavations. The impacts would be less than significant with incorporation of the following mitigation measures in the project.

Historical Resources

Historical resources, as defined by CEQA Guidelines, are cultural resources eligible for the CRHR. To be eligible for the CRHR, a resource must have integrity and meet one or more of the following significance criteria:

1. 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.

2. Associated with the lives of persons important to local, California or national history.

3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.

4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Buried and undiscovered prehistoric and Historic Period archaeological sites may be eligible for the CRHR. Most commonly, CRHR eligible archaeological sites meet Criterion 4.

If an archaeological site is discovered during construction, implementation of Cultural Resources Mitigation Measure 1.0 is recommended.

Cultural Resources Mitigation Measure 1.0: Historical Resources

1.1 Immediately halt all activity within 15 meters of the archaeological site.

1.2 Complete an evaluation of the archaeological site conducted by a qualified archaeologist. Evaluation may require archaeological test excavation. If so, submit a copy of the test excavation technical report to the CHRIS, and donate documentation of the test excavation and artifact collection to the San Bernardino County Museum, or another suitable museum or repository.

1.3 If the archaeological site is CRHR eligible, and protection, stabilization, and preservation of the archaeological site is feasible, implement protection, stabilization, and preservation in accordance with a plan prepared by a qualified archaeologist.

1.4 If the archaeological site is CRHR eligible, and protection, stabilization, and preservation of the archaeological site is not feasible, implement data recovery by a qualified archaeologist in accordance with a research design and data recovery plan prepared by a qualified archaeologist. Data recovery may require archaeological excavation.

1.5 If data recovery is conducted, submit a copy of the data recovery technical report to the CHRIS, and donate documentation of the data recovery and the artifact collection to the San Bernardino County Museum, or another suitable museum or repository.

Unique Archaeological Resources

As defined by CEQA (§21083.2), a unique archaeological resource meets one or more of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Buried and undiscovered Prehistoric and Historic Period artifacts, objects, and sites may be unique archaeological resources as defined by CEQA.

If an archaeological site is discovered during construction, implementation of Cultural Resources Mitigation Measure 2.0 is recommended.

Cultural Resources Mitigation Measure 2.0: Unique Archaeological Resources

2.1 Immediately halt all activity within 15 meters of the archaeological site.

2.2 Complete an evaluation of the archaeological site conducted by a qualified archaeologist. Evaluation may require archaeological test excavation. If so, submit a copy of the test excavation technical report to the CHRIS, and donate documentation of the test excavation and artifact collection to the San Bernardino County Museum, or another suitable museum or repository.

2.3 If the archaeological site is a unique archaeological resource as defined by CEQA, and protection, stabilization, and preservation of the archaeological site is feasible, implement protection, stabilization, and preservation in accordance with a plan prepared by a qualified archaeologist.

2.4 If the archaeological site is a unique archaeological resource as defined by CEQA and protection, stabilization, and preservation of the archaeological site is not feasible, implement data recovery by a qualified archaeologist in accordance with a research design and data recovery plan prepared by a qualified archaeologist. Data recovery may require archaeological excavation.

2.5 If data recovery is conducted, submit a copy of the data recovery technical report to the CHRIS, and donate documentation of the data recovery and the artifact collection to the San Bernardino County Museum, or another suitable museum or repository.

Human Remains

In addition to CEQA protection, human remains are protected by the California Health and Safety Code and the California Public Resources Code (CNAHC n.d.). Buried, unmarked, and undiscovered human remains may inhumations or cremations, and may be prehistoric, Historic Period, or modern.

If human remains are discovered during construction or archaeological excavations, implementation of Cultural Resources Mitigation Measure 3.0 is recommended.

Cultural Resources Mitigation Measure 3.0: Human Remains

3.1 Treat human remains with dignity and respect at all times.

3.2 Immediately halt all activity within 15 meters of the human remains.

3.3 Immediately report the discovery of human remains to the coroner. If the human remains are Native American, the coroner will report the discovery to the CNAHC and the CNAHC will report the discovery to the Most Likely Descendant (MLD).

3.4 In consultation with the MLD, develop a plan for the treatment and disposition of the human remains and grave goods. Treatment may include archaeological excavation and scientific investigation.

3.5 With the concurrence of the MLD, implement the plan for the treatment and disposition of the human remains and grave goods.

Paleontological Resources

Older Pleistocene alluvium at the project site is a paleontological resource because it is a significant fossiliferous deposit. The Society of Vertebrate Paleontology (1995) defines a significant fossiliferous deposit as:

> "... a rock unit or formation which contains significant nonrenewable paleontological resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information."

Implementation of Cultural Resources Mitigation Measure 4.0 is recommended.

Cultural Resources Mitigation Measure 4.0: Paleontological Resources

4.1 When and where construction excavation is to a depth greater than the depth of recent Holocene alluvial fan and wind-blown sand deposits, implement monitoring by a qualified paleontologist. Monitoring may require full-time observation, inspection of trench faces, inspection of excavated sediments, sample screening of excavated sediments, collection, stabilization, preparation, and analysis of samples of plant and invertebrate fossils, and salvage, stabilization, preparation, and analysis of vertebrate fossils.

4.2 Donate paleontological documentation, plant and invertebrate fossil samples, and salvaged vertebrate fossils, and a copy of the paleontological monitoring technical report to the San Bernardino County Museum, or another suitable museum or repository.

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APPENDIX A: PERSONNEL QUALIFICATIONS

Matthew Wetherbee, M.Sc., RPA
Archaeologist

Education: M.Sc., Palaeoecology of Human Societies, University College, London
BA, Anthropology, University of California, Santa Cruz

Mr. Matthew Wetherbee is an archaeologist with 10 years experience in archaeological practice throughout southern California and Egypt as well as in cultural resources management including prehistoric and historic archaeology, traditional cultural properties, and Native American consultation. He has preformed Cultural Resources investigations for CEQA/NEPA cultural resources sections of environmental documents. In addition, Mr. Wetherbee has extensive experience in Federal Section 106 compliance documentation, cultural resource evaluation, analyses, and reports, of the National Historic Preservation Act. He has planned and conducted cultural resource literature and records searches, historical research, archaeological field surveys, site recordation and mapping, and construction monitoring. He has also analyzed faunal remains from archaeological sites in Egypt and southern California. Mr. Wetherbee has experience consulting with the Native American Heritage Commission and Native American tribes, and has served as a liaison between construction personnel, tribal monitors, and agency representatives. Mr. Wetherbee is a member of the Society for American Archaeology, the International Council of Archaeozoology, and several other professional organizations, and is a Registered Professional Archaeologist. Mr. Wetherbee holds a Bachelor of Arts degree in Anthropology from University of California at Santa Cruz, and a Masters of Science in Palaeoecology of Human Societies from the Institute of Archaeology at University College London, England. Prior to working at Stantec he held positions with CRM TECH, Viejo California, SWCA, and an internship at the American University in Cairo, Egypt.

Sarah Siren, M.Sc.
Paleontologist

Education: M.Sc., Paleontology, South Dakota School of Mines and Technology
B.Sc., Geology, The George Washington University

Mrs. Siren attended George Washington University and was awarded a Master's degree in Vertebrate Paleontology from the South Dakota School of Mines and Technology. She conducted studies at both the Smithsonian Institution and Badlands National Park, and has supervised as lead research scientist for various field activities, curation projects, and laboratory preparations. Her diverse experience includes monitoring, identifying, mapping and preparing fossils. She currently serves as Project Manager / Paleontologist for numerous projects in southern California involving multiple agencies, public and private sector clients, a variety of resources, and multidisciplinary staff supervision. She is also a curatorial assistant with the Natural History Museum of Los Angeles County, and an associate professor of geology at Saddleback College in Mission Viejo, California.

Gavin Archer, MA, RPA
Principal, Archaeology & Paleontology

Education: MA / 1990 / Anthropology (Archaeology Thesis), University of Arizona
BA / 1987 / Anthropology, University of Arizona

Mr. Archer has studied and practiced anthropology and archaeology in California, Arizona, Hawaii, Colorado, Alaska, Louisiana, Georgia, and northwest Mexico since 1982. In 1990, he earned a Master's degree in Anthropology at the University of Arizona with an archaeology thesis. His research interests include the prehistory, history and ethnography of California and the Greater Southwest. Mr. Archer is a member of the Society for American Archaeology, the Society for California Archaeology, and several other professional organizations, and a Registered Professional Archaeologist. His expertise includes all aspects of archaeological investigation, documentary research, Native American consultation, and regulatory compliance. Previously, he has held positions with The Keith Companies, SWCA Environmental Consultants, Gila River Indian Community, Desert Archaeology, Bishop Museum, and University of Arizona.

Rachel Mills
Paleontology Technician

Education: B.Sc., Earth Sciences, University of California, Santa Cruz

Ms. Mills has performed full and part time archaeological and paleontological monitoring during mass grading operations of various development projects ranging from single industrial buildings to large residential developments. Her experience includes using GPS to document and map locations of resources, preserving paleontological and archaeological resources for collection and transport utilizing the guidelines of the Orange County Curation, and preparing specimens in laboratory for further study and categorizing.

Ms. Mills is also experienced in the performance of detailed geologic reconnaissance studies through literature review, analysis of stereoscopic aerial photographs, and field mapping. She has performed geologic and geotechnical field evaluations including detailed logging of borings, test pits, and trenches, and conducted the analysis of collected geotechnical field and office data such as the preparation of cross sections and performance of engineering calculations. Ms. Mills has also prepared geotechnical and geologic reports; and has provided geotechnical observation, documentation, and testing services for earthwork projects including mass grading, stability fill, and underground utilities; and has provided of support to staff level engineers, geologists, and field technicians.

Ryan Taft
Archaeology Technician

Education: BA, Anthropology, Humboldt State University, Arcata, California

Mr. Taft is a second year graduate student in the Anthropology Department at California State University, Fullerton. He is fully qualified to conduct archaeological surveys, excavations, and laboratory work for cultural resource management in southern California. Mr. Taft is a member of the Pi Gamma Mu International Honor Society for Social Sciences. He also conducts chipped stone analysis for project reports with Stantec.

APPENDIX B: SACRED LAND FILE SEARCH RESULTS

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

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
e-mail: ds_nahc@pacbell.net

July 18, 2007

Matthew Wetherbee, MSc., RPA
Project Archaeologist
StantecInc
East Guasti Road
Ontario, CA 91761

Sent by FAX: 909-390-8865
Number of pages: 3

Re: Proposed New Model Colony East Infrastructure in Ontario, San Bernardino County.

Dear Mr. Wetherbee:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any 'area of potential effect (APE).'

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 nearest tribes that may have knowledge of cultural resources in the project area. A List of Native American contacts are attached to assist you. 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. 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
San Bernardino County
July 16, 2007

Cahuilla Band of Indians
Anthony Madrigal, Jr., Interim-Chairperson
P.O. Box 391760 Cahuilla
Anza , CA 92539
tribalcouncil@cahuilla.net
(951) 763-2631

(951) 763-2632 Fax

Ramona Band of Mission Indians
Joseph Hamilton, vice chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

San Manuel Band of Mission Indians
Henry Duro, Chairperson
26569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3370 Fax

Ti'At Society
Cindi Alvitre
6602 Zelzah Avenue Gabrielino
Reseda , CA 91335
calvitre@yahoo.com
(714) 504-2468 Cell

Gabrieleno/Tongva Tribal Council
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
ChiefRBwife@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 Fax

Gabrielino/Tongva Council / Gabrielino Tongva Nation
Sam Dunlap, Tribal Secretary
761 Terminal Street; Bldg 1, 2nd floor Gabrielino Tongva
Los Angeles , CA 90021
office @tongvatribe.net
(213) 489-5001 - Officer
(909) 262-9351 - cell
(213) 489-5002 Fax

Gabrielino Band of Mission Indians of CA
Ms. Susan Frank
PO Box 3021 Gabrielino
Beaumont , CA 92223
(951) 897-2536 Phone/Fax

Morongo Band of Mission Indians
Britt W. Wilson, Cultural Resources-Project Manager
49750 Seminole Drive Cahuilla
Cabazon , CA 92230 Serrano
britt_wilson@morongo.org
(951) 755-5206
(951) 755-5200/323-0822-cell
(951) 922-8146 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 New Model Colony East Infrastructure in Ontario; San Bernardino County, California for which a Sacred Lands File search was requested.

Native American Contacts
San Bernardino County
July 16, 2007

San Manuel Band of Mission Indians
Ann Brierty, Environmental Department
101 Pure Water Lane Serrano
Highland , CA 92346
abrierty@sanmanuel-nsn.gov
(909) 863-5899 EXT-4321

(909) 862-5152 Fax

Serrano Band of Indians
Goldie Walker
6588 Valeria Drive Serrano
Highland , CA 92346
(909) 862-9883

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 New Model Colony East infrastructure in Ontario; San Bernardino County, California for which a Sacred Lands File search was requested.

APPENDIX C: PALEONTOLOGICAL RECORDS SEARCH RESULTS

SAN BERNARDINO COUNTY MUSEUM
2024 Orange Tree Lane · Redlands, California USA 92374-4560
(909) 307-2669 · Fax (909) 307-0539 · www.sbcountymuseum.org

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT SERVICES GROUP

ROBERT L. McKERNAN
Director

4 April 2006

Stantec Consulting, Incorporated
attn: Sarah Siren
19 Technology Drive
Irvine, CA 92618

re: **PALEONTOLOGY RECORDS REVIEW, SUBAREA #18, CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA**

Dear Sarah,

The Division of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a literature review and records search for the above-named project property in the southern Ontario region of San Bernardino County, California. Specifically, the project is located in portions of sections 14 and 15, Township 2 South, Range 7 West, San Bernardino Base and Meridian, as seen on the Corona North, California and the Guasti, California 7.5' United States Geological Survey topographic quadrangle maps (1967 and 1966 editions, respectively, both photorevised 1981).

Previous mapping of the proposed property (Rogers, 1965; Morton and Gray, 2002) indicates that the study area is situated upon surface exposures of Holocene fan deposits (= unit **Qyf**) overlain in some areas by Holocene windblown sand (= **Qye**). These Holocene sediments have low paleontologic sensitivity. However, these sediments overlie older Pleistocene alluvial sediments that have high potential to contain significant nonrenewable paleontologic resources, and so are assigned high paleontologic sensitivity. Pleistocene alluvial sediments elsewhere throughout Riverside and San Bernardino Counties and the Inland Empire have been reported to yield significant fossils of extinct animals from the Ice Age (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Pajak and others, 1996; Scott, 1997; Springer and others, 1998, 1999). Fossils recovered from these Pleistocene sediments represent extinct taxa including mammoths, mastodons, ground sloths, dire wolves, sabre-toothed cats, large and small horses, large and small camels, and bison, as well as plant macro- and microfossils (Jefferson, 1991; Reynolds and Reynolds, 1991; Woodburne, 1991; Springer and Scott, 1994; Scott, 1997; Springer and others, 1998, 1999; Anderson and others, 2002). If present in the subsurface, and depending upon the lithology exhibited, these sediments have high potential to contain significant nonrenewable paleontologic resources.

For this review, I conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this records search indicated that no paleontologic localities are recorded from within the boundaries of the proposed study area. The nearest paleontologic resource locality that has yielded fossils from Pleistocene older alluvium (SBCM 5.1.8) is situated roughly 1½ miles northeast of the property. This locality yielded fossil remains of extinct mammoth (*Mammuthus*) from depths of approximately 20' below the existing ground surface.

Recommendations

The results of the literature review and the search of the RPLs at the SBCM demonstrate that the proposed property is situated upon Pleistocene older alluvial deposits present at depth that, if not previously disturbed by development, have high potential to contain paleontologic resources. Excavation in this older alluvium therefore has high potential to impact paleontologic resources. A qualified vertebrate paleontologist must develop a program to mitigate impacts to nonrenewable paleontologic resources. This mitigation program must be consistent with the provisions of the California Environmental Quality Act (Scott and Springer, 2003), as well as with regulations currently implemented by the County of San Bernardino and the proposed guidelines of the Society of Vertebrate Paleontology. This program should include, but not be limited to:

1. Monitoring of excavation in areas identified as likely to contain paleontologic resources by a qualified paleontologic monitor. Areas requiring monitoring include all previously-undisturbed Pleistocene older alluvial sediments present at depth within the boundaries of the property. Paleontologic monitors should be equipped to salvage fossils as they are unearthed, to avoid construction delays, and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. Monitors must be empowered to temporarily halt or divert equipment to allow removal of abundant or large specimens. Monitoring may be reduced if the potentially-fossiliferous units described herein are not present in the subsurface, or if present are determined upon exposure and examination by qualified paleontologic personnel to have low potential to contain fossil resources.

2. Preparation of all recovered specimens to a point of identification and permanent preservation, including washing of sediments to recover small invertebrates and vertebrates. Preparation and stabilization of all recovered fossils are essential in order to fully mitigate adverse impacts to the resources (Scott and others, 2004).

3. Identification and curation of specimens into an established, accredited museum repository with permanent retrievable paleontologic storage (e.g., SBCM). These procedures are also essential steps in effective paleontologic mitigation (Scott and others, 2004) and CEQA compliance (Scott and Springer, 2003). The paleontologist must have a written repository agreement in hand prior to the initiation of mitigation activities. Mitigation of adverse impacts to significant paleontologic resources is not considered complete until such curation into an established museum repository has been fully completed and documented.

4. Preparation of a report of findings with an appended itemized inventory of specimens. The report and inventory, when submitted to the appropriate Lead Agency along with confirmation of the curation of recovered specimens into an established, accredited museum

repository, would signify completion of the program to mitigate impacts to paleontologic resources.

References

Anderson, R.S., M.J. Power, S.J. Smith, K.B. Springer and E. Scott. 2002. Paleoecology of a Middle Wisconsin deposit from southern California. Quaternary Research 58(3): 310-317.

Jefferson, G.T., 1991. A catalogue of late Quaternary vertebrates from California: Part Two, mammals. Natural History Museum of Los Angeles County Technical Reports, No. 7.

Morton, D.M. and C.H. Gray, Jr., 2002. Geologic map of the Corona North 7.5' quadrangle, Riverside and San Bernardino Counties, California, version 1.0. United States Geological Survey Open-File Report 02-22. Digital preparation by K.R. Bovard and M. Dawson. 18 p.

Reynolds, S.F.B. and R.L. Reynolds. 1991. The Pleistocene beneath our feet: near surface Pleistocene fossils in inland southern California basins. *in* Inland Southern California: the last 70 million years, M.O. Woodburne, S.F.B. Reynolds, and D.P. Whistler, eds. Redlands, San Bernardino County Museum Special Publication 38(3&4). p. 41-43.

Rogers, T.H., 1965. Geologic map of California, Santa Ana sheet. California Division of Mines and Geology. Scale 1:250,000.

Scott, E., 1997. A review of *Equus conversidens* in southern California, with a report on a second, previously unrecognized species of Pleistocene small horse from the Mojave Desert. Journal of Vertebrate Paleontology 17(3): 75-A.

Scott, E. and K. Springer. 2003. CEQA and fossil preservation in southern California. The Environmental Monitor, Fall 2003, p. 4-10, 17.

Scott, E., K. Springer and J.C. Sagebiel, 2004. Vertebrate paleontology in the Mojave Desert: the continuing importance of "follow-through" in preserving paleontologic resources. In M.W. Allen and J. Reed (eds.) The human journey and ancient life in California's deserts. Proceedings from the 2001 Millennium Conference. Ridgecrest: Maturango Museum Publication No. 15, p. 65-70.

Springer, K.B., E. Scott, L.K. Murray and W.G. Spaulding. 1998. Partial skeleton of a large individual of *Mammut americanum* from the Domenigoni Valley, Riverside County, California. Journal of Vertebrate Paleontology 18(3): 78-A.

Springer, K.B., E. Scott, J.C. Sagebiel and K.M. Scott. 1999. A late Pleistocene lake edge vertebrate assemblage from the Diamond Valley, Riverside County, California. Journal of Vertebrate Paleontology 19(3): 77-A.

Woodburne, M.O., 1991. The Cajon Valley. *in* Inland Southern California: the last 70 million years, M.O. Woodburne, S.F.B. Reynolds, and D.P. Whistler, eds. Redlands, San Bernardino County Museum Special Publication 38(3&4), p. 41-43.

Please do not hesitate to contact us with any further questions you may have

Sincerely,

Eric Scott, Curator of Paleontology
Division of Geological Sciences
San Bernardino County Museum

Natural History

of Los Angeles County

900 Exposition Boulevard, Los Angeles, CA 90007

Vertebrate Paleontology Section
Telephone: (213) 763-3325
FAX: (213) 746-7431
e-mail: smcleod@nhm.org

7 March 2006

Stantec Consulting Inc.
19 Technology Drive
Irvine, CA 92618-2334

Attn: Sarah Siren, Paleontologist

re: Paleontological resources for the proposed Subarea 18, in the City of Ontario, San Bernardino County, Project # 2052 204408, project area

Dear Sarah:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Subarea 18, in the City of Ontario, San Bernardino County, Project # 2052 204400, project area as outlined on the section of the Corona North and Guasti USGS topographic quadrangle maps that you sent to me via e-mail on 3 March 2006. We do not have any vertebrate fossil localities that lie directly within the proposed project boundaries, but we do have a fossil vertebrate locality nearby from sediments similar to those that may occur as subsurface deposits in the proposed project area.

Surficial deposits in the proposed project area are either younger Quaternary fan deposits, in the western portion, or younger Quaternary aeolian (sand dune) deposits, in the eastern portion. We have no vertebrate fossil localities anywhere nearby from these deposits and they typically do not contain significant fossil vertebrate materials, at least in the uppermost layers. Older Quaternary deposits occur at the surface west and south of the proposed project area, however, and are likely to occur as subsurface deposits in the proposed project area. Our closest fossil vertebrate locality from these older Quaternary deposits is LACM 1207, almost directly south of the proposed project area between Corona and Norco, that produced a fossil specimen of deer, *Odocoileus*.

The uppermost layers of younger Quaternary fan and aeolian deposits in the proposed project area are unlikely to contain significant fossil vertebrate remains. Excavations that extend down into the older Quaternary sediments, however, may well encounter significant vertebrate fossils. Any substantial subsurface excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains while not impeding development. Additional fossil locality information for the area may be available through the University of California at Riverside Department of Geology (collections and records now at the University of

California at Berkeley Museum of Paleontology) or the San Bernardino County Museum in Redlands. Any fossils collected should be placed in an accredited scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

Appendix F3 Tribal Consultation

Appendices

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NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento, California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

STATE OF CALIFORNIA **Gavin Newsom, *Governor***

NATIVE AMERICAN HERITAGE COMMISSION

October 19, 2023

Lexie Zimny
PLACEWORKS

Via Email to: lzimny@placeworks.com

Re: Native American Consultation, Pursuant to Senate Bill 18 (SB18), Government Codes §65352.3 and §65352.4, as well as Assembly Bill 52 (AB52), Public Resources Codes §21080.1, §21080.3.1 and §21080.3.2, Ontario Regional Sports Complex Project, San Bernardino County

Dear Ms. Zimny:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties or projects.

Government Codes §65352.3 and §65352.4 require local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of avoiding, protecting, and/or mitigating impacts to cultural places when creating or amending General Plans, Specific Plans and Community Plans.

Public Resources Codes §21080.3.1 and §21080.3.2 requires public agencies to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of avoiding, protecting, and/or mitigating impacts to tribal cultural resources as defined, for California Environmental Quality Act (CEQA) projects.

The law does not preclude local governments and agencies from initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction. The NAHC believes that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

Best practice for the AB52 process and in accordance with Public Resources Code §21080.3.1(d), is to do the following:

Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The NAHC also recommends, but does not require that lead agencies include in their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential affect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

    - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE, such as known archaeological sites;
    - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
    - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the APE; and
    - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

    All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code Section 6254.10.

3. The result of the Sacred Lands File (SFL) check conducted through the Native American Heritage Commission was negative.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event, that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address: Cameron.vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

Attachment

From:	Thomas Grahn
To:	Kimberly Ruddins; Nicole Vermilion; Lexie Zimny
Subject:	FW: ORSC Tribal Consultation Notice - SB18/AB52
Date:	Tuesday, October 3, 2023 4:25:59 PM
Attachments:	image001.png Christina Conley SB18 AB32 Letter.pdf

---

From: Christina Marsden Conley <christina.marsden@alumni.usc.edu>
Sent: Friday, September 22, 2023 11:42 AM
To: Thomas Grahn <TGrahn@ontarioca.gov>
Subject: Re: ORSC Tribal Consultation Notice - SB18/AB52

Good afternoon Thomas,

We will defer comments to our sister tribe, Sandonne Goad
Tribal Council Chairwoman
Gabrielino/Tongva Nation

Take care
Christina

tehoovet taamet
C H R I S T I N A C O N L E Y
•Native American Monitor - Caretaker of our Ancestral Land and Water
•Cultural Resource Administrator Under Tribal Chair, Robert Dorame (Most Likely Descendant) of Pimugna (Catalina Island), Carson, Huntington Beach, Long Beach, Marina del Rey, Playa Vista, Studio City
•Native American Heritage Commission Contact
•Fully qualified as a California State Recognized Native American Tribe fulfilling SB18, AB52 Compliance Regulations
•HAZWOPER Certified
•626.407.8761

G A B R I E L I N O T O N G V A I N D I A N S O F C A L I F O R N I A
The Gabrielino Tongva Indians of California tribe is traditionally and culturally recognized in the State of California Bill AJR96 as the aboriginal tribe to encompass the entire Los Angeles Basin area to Laguna Beach, extending to the Channel Islands of Santa Catalina, San Nicholas and San Clemente Islands

****I am presently on a field site with limited communication- please excuse any typos*****

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. This e-mail may also contain CONFIDENTIAL AND PRIVILEGED INFORMATION AND/OR ATTORNEY WORK PRODUCT. This information is only for the intended recipient. If you have received this email in error please notify the system manager. If you are not the named addressee and intended recipient you may not disseminate, distribute or copy this e-mail. Please notify the sender immediately by e-mail if you have received this e-mail by mistake and delete this e-mail from your system. If you are not the intended recipient you are hereby notified that disclosing, copying, distributing or taking any action in reliance on the contents of this information is strictly prohibited.

On Sep 22, 2023, at 11:37 AM, Thomas Grahn <TGrahn@ontarioca.gov> wrote:

The City's SB 18 & AB 52 Notice for the Ontario Regional Sports Complex is attached. Please contact me should you have any questions.

Thomas Grahn
Senior Planner
City of Ontario Planning Department
303 East B Street
Ontario, CA 91764
(909) 395-2413
tgrahn@ontarioca.gov

Contact us by phone at 909.395.2036 or by email at PlanningCounter@ontarioca.gov for general Planning-related information.

To see the status of your permit, visit the Citizen Portal Access: https://automation.ontarioca.gov/onlinePermits/Default.aspx

From:	Thomas Grahn
To:	Nicole Vermilion; Lexie Zimny; Kimberly Ruddins
Subject:	FW: Ontario Regional Sports Complex Project Follow Up
Date:	Monday, October 2, 2023 4:53:16 PM

From: Lorrie Gregory <LGregory@cahuilla-nsn.gov>
Sent: Monday, October 2, 2023 2:35 PM
To: Thomas Grahn <TGrahn@ontarioca.gov>
Cc: BobbyRay Esparza <besparza@cahuilla-nsn.gov>
Subject: Ontario Regional Sports Complex Project Follow Up

Good Afternoon Mr. Grahn,

I am reaching out today to follow up on the consultation letter that we sent last month regarding the Ontario Regional Sports Complex Project. Due to the large ground disturbance and project vicinity being within traditional Cahuilla land use, we wish to consult on this project. We request that you send any cultural material reports associated with the project for review. Thank you for reaching out in regards to the project, have a good rest of your day.

Respectfully,

Lorrie Gregory
Cultural Resource Coordinator
Cahuilla Band of Indians
Phone: 1 (760) 315-6839
Email: lgregory@cahuilla-nsn.gov

Cahuilla Band of Indians
Cultural Department

52701 CA-Highway 371 Anza, California 92539

September 15, 2023

Mr. Thomas Grahn
City of Ontario

RE: Ontario Regional Sports Complex

To Whom It May Concern:

Thank you for contacting the Cahuilla Band of Indians concerning the above referenced project.

On behalf of the Cahuilla Band of Indians the Cahuilla Cultural Department would like express the concern that the proposed project area may be sensitive for cultural resources, based on the maps provided and location, the proposed project is located in the Tribes Traditional Land Use Area. The Cahuilla Cultural Department believes that in order to mitigate the disturbance of known cultural resources and possible undiscovered resources that may be found during ground disturbances it would be best practice to have Cahuilla Tribal Monitor(s) on site for all ground disturbances. However, the heavy disturbances of the Project Area may have displaced cultural resources on the surface, it is possible that intact cultural resources exist at depth. Incorporation of Cahuilla Tribal Monitors would reduce impacts to known and unknown cultural resources to a level of less than significant. The Cahuilla Band of Indians would like to be consulted on this project. We request to setup a meeting to discuss the project at your earliest convenience. Please let us know a date and time that best fits your schedule.

Sincerely,

BobbyRay Esparza
Cultural Director
Cahuilla Band of Indians

Phone (951) 763-5549 *Fax (951) 763-2808*
Email: besparza@cahuilla-nsn.gov

THPO
Pala Band of Mission Indians

TRIBAL HISTORIC PRESERVATION OFFICE
PALA BAND OF MISSION INDIANS
PMB 50, 35008 Pala Temecula Road | Pala, CA 92059
Phone 760-891-3510 | www.palatribe.com

October 13, 2023

Thomas Grahn
City of Ontario
303 East B Street
Ontario, CA 91764

Re: AB-52 Consultation; Ontario Regional Sports Conplex

Dear Thomas Grahn:

The Pala Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Robert Smith, Tribal Chairman.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized Pala Indian Reservation. The project is also beyond the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we decline AB-52 consultation at this time, but do not waive our right to request consultation under other applicable laws in the future. At this point we defer to the wishes of Tribes in closer proximity to the project area.

We appreciate involvement with your initiative and look forward to working with you on future efforts. Pala is now offering tribal monitoring services. If you have questions or need additional information, please do not hesitate to contact Alexis Wallick by telephone at 760-891-3537 or by e-mail at THPO@palatribe.com.

Sincerely,

Shasta C. Gaughen, PhD
Tribal Historic Preservation Officer
Pala Band of Mission Indians

Consultation Letter 7

From: Lorrie Gregory <LGregory@cahuilla-nsn.gov>
Sent: Monday, November 27, 2023 3:45 PM
To: Robert Morales <RMorales@ontarioca.gov>
Cc: Thomas Grahn <TGrahn@ontarioca.gov>; Kimberly Ruddins <Kruddins@ontarioca.gov>
Subject: Re: Consultation Request: Ontario Regional Sports Complex

Great,

Thank you very much for taking the time to meet with the Cahuilla Band today. We will review and let you know f we have any comments or concerns. We look forward working with your team on the following project. Have a great rest of you day.

Respectfully,

Lorrie Gregory
Cultural Resource Coordinator
Cahuilla Band of Indians

Phone: 1 (760) 315-6839
Email: lgregory@cahuilla-nsn.gov

From: Robert Morales <RMorales@ontarioca.gov>
Sent: Monday, November 27, 2023 3:37 PM
To: Lorrie Gregory <LGregory@cahuilla-nsn.gov>
Cc: Thomas Grahn <TGrahn@ontarioca.gov>; Kimberly Ruddins <Kruddins@ontarioca.gov>
Subject: RE: Consultation Request: Ontario Regional Sports Complex

Hi Lorrie,

Attached are today's meeting notes for your records. Below are the links to the Armstrong Ranch Specific Plan's EIR Appendix E Cultural Report and the digital copy of the existing EIR for the entire plan:

- Armstrong Ranch Specific Plan's EIR Appendix E Cultural Report: Appendix E Link
- Digital copy of the existing EIR for the entire specific plan: Specific Plans Link

Please feel free to reach out if you have any questions or need further clarification.

Best regards,

Robert Morales
Assistant Planner
City of Ontario | Planning Department
303 East B Street, Ontario CA 91764
P: (909) 395 – 2432 | E: Rmorales@ontarioca.gov

To see the status of your permit, visit the Citizen Portal
Access: https://automation.ontarioca.gov/onlinePermits/Default.aspx

- *The Planning Department counter is open for appointments. Click here to book your appointment. [booknow.appointment-plus.com]*
- *Contact us by phone at (909) 395-2036 or by email at PlanningCounterMail@ontarioca.gov for general Planning-related information.*
- *We appreciate your business and your patience.*

From: Lorrie Gregory <LGregory@cahuilla-nsn.gov>
Sent: Friday, November 17, 2023 8:42 AM
To: Robert Morales <RMorales@ontarioca.gov>
Cc: Thomas Grahn <TGrahn@ontarioca.gov>; Kimberly Ruddins <Kruddins@ontarioca.gov>
Subject: Re: Consultation Request: Ontario Regional Sports Complex

Good morning,

The Cahuilla Band of Indians would be interested in consultation. The earliest dates available are **November 27 at 10:00 am**, OR **November 29, at 10:00 am.** We prefer to meet via Microsoft Teams, but any other platform is fine. Thank you for reaching out, and hope to hear from you soon! Happy Friday!

Respectfully,

Lorrie Gregory
Cultural Resource Coordinator
Cahuilla Band of Indians
Phone: 1 (760) 315-6839
Email: lgregory@cahuilla-nsn.gov

From: Robert Morales <RMorales@ontarioca.gov>
Sent: Friday, November 17, 2023 8:21 AM
To: Lorrie Gregory <LGregory@cahuilla-nsn.gov>
Cc: Thomas Grahn <TGrahn@ontarioca.gov>; Kimberly Ruddins <Kruddins@ontarioca.gov>
Subject: Consultation Request: Ontario Regional Sports Complex

Good Morning Ms. Gregory,

The City of Ontario seeks a consultation with the Cahuilla Band of Indians regarding the Ontario Regional Sports Complex within your Ancestral Tribal Territory. We propose a meeting at your earliest convenience, in person, by telephone, or via video conference. Your input is vital, and we're committed to an open dialogue that respects your knowledge and concerns. Please see the attached letter for your records and share your availability.

Best,

Robert Morales
Assistant Planner
City of Ontario | Planning Department
303 East B Street, Ontario CA 91764
P: (909) 395 – 2432 | E: Rmorales@ontarioca.gov

CITY OF ONTARIO

To see the status of your permit, visit the Citizen Portal
Access: https://automation.ontarioca.gov/onlinePermits/Default.aspx

The Planning Department counter is open for appointments. Click here to book your appointment.

[booknow.appointment-plus.com]

- *Contact us by phone at (909) 395-2036 or by email at PlanningCounterMail@ontarioca.gov for general Planning-related information.*
- *We appreciate your business and your patience.*

AB 32 and SB 18 Consultation – Cahuila Tribe

11/27/23 | 10:00 am – 11:00 am TEAMS Meeting

MEETING CALLED BY	Robert Morales	***ATTENDEES (* AS NEEDED FOR AGENDA)***		
MEETING PURPOSE	Tribal Consultation	**CITY PMT** **KR** **TG** **RM**	**Cahuila** **LG** **BRE**	**PLACEWORKS**
PLEASE READ BEFORE				
PLEASE BRING				
ATTACHMENTS ITEM REF#				

AGENDA OUTLINE

ITEM	NOTES
NEW	
1. Introductions 2. Items Discussed a. Kimberly Ruddins provided Project Overview. b. Estimated Timeline - Grading is scheduled to commence between September and October 2024, starting with the ballpark area. The grading process is expected to span a few months. c. Are there any archaeological items in the City that need to be reported? i. The City will share the existing Armstrong Ranch Specific Plan EIR information	

d. The City is currently updating the cultural report, anticipated to be completed within two weeks.

    i. The City will forward the completed report once it's available.

e. Is the City open to on-site moderation?
    i. Yes

f. The City will coordinate with the tribe to have monitors on the project site as needed, especially during any ground disturbance.

g. The City will share with the tribe promptly when cultural materials are discovered.

h. The City will share the Project schedule as identified within the EIR Project Description.

From: Robert Morales <RMorales@ontarioca.gov>
Sent: Friday, December 15, 2023 12:14 PM
To: Gabrieleno Administration <admin@gabrielenoindians.org>
Cc: Kimberly Ruddins <Kruddins@ontarioca.gov>; Thomas Grahn <TGrahn@ontarioca.gov>; Nicole Vermilion <nvermilion@placeworks.com>
Subject: RE: AB52- Ontario Regional Sports Complex Project

Good afternoon Brandy,

We appreciate your comments, and we will take it into consideration.

Best,

Robert Morales
Assistant Planner
City of Ontario | Planning Department
303 East B Street, Ontario CA 91764
P: (909) 395 – 2432 | E: Rmorales@ontarioca.gov

CITY OF ONTARIO

In observance of the holidays, City Hall will be closed from Monday, December 25, 2023, through Tuesday, January 2, 2024, resuming normal business hours on Wednesday, January 3, 2024.

I will be out of the office Thursday, December 21, 2023 – returning Monday, January 8, 2024.

To see the status of your permit, visit the Citizen Portal
Access: https://automation.ontarioca.gov/onlinePermits/Default.aspx

- *The Planning Department counter is open for appointments. Click here to book your appointment.*

- *Contact us by phone at (909) 395-2036 or by email at PlanningCounterMail@ontarioca.gov for general Planning-related information.*
- *We appreciate your business and your patience.*

From: Gabrieleno Administration <admin@gabrielenoindians.org>
Sent: Thursday, December 14, 2023 12:34 PM
To: Robert Morales <RMorales@ontarioca.gov>
Subject: Re: AB52- Ontario Regional Sports Complex Project

Hello Robert

I am just following up on my last email.

Brandy Salas
Admin Specialist
Gabrieleno Band of Mission Indians - Kizh Nation
PO Box 393
Covina, CA 91723
Office: 844-390-0787
website: www.gabrielenoindians.org [gabrielenoindians.org]

The region where Gabrieleño culture thrived for more than eight centuries encompassed most of Los Angeles County, more than half of Orange County and portions of Riverside and San Bernardino counties. It was the labor of the Gabrieleño who built the missions, ranchos and the pueblos of Los Angeles. They were trained in the trades, and they did the construction and maintenance, as well as the farming and managing of herds of livestock. "The Gabrieleño are the ones who did all this work, and they really are the foundation of the early economy of the Los Angeles area ". "That's a contribution that Los Angeles has not recognized--the fact that in its early decades, without the Gabrieleño, the community simply would not have survived."

On Tue, Nov 21, 2023 at 3:43 PM Gabrieleno Administration <admin@gabrielenoindians.org> wrote:

> Hello Robert,
>
> . In order to enable the AB52 process to continue without delay we are providing our concerns in written form for this project in lieu of the in-person meeting. The information provided herein is to be kept confidential as part of AB52 which requires that any information – not just documents – submitted by a California Native American tribe during the environmental review process to not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency or to the public consistent with Gov. Code Sections 6254, subd.(r) and 6254.10. (Pub. Resources Code § 21082.3, subd. (c)(1)). We ask that the information be included

Appendix G1 2016 Geotechnical Report

Appendices

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ALTA CALIFORNIA
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CV COMMUNITIES
3121 Michleson Drive, Suite 150
Irvine, California 92612

April 14, 2015
Project Number 1-0152

Attention: Mr. Adam Smith

Subject: ***PRELIMINARY GEOTECHNICAL INVESTIGATION***
Armstrong Ranch Specific Plan, DeBoer Parcels
City of Ontario, County of San Bernardino, California

References: See Appendix A

Mr. Smith

Presented herein is Alta California Geotechnical, Inc.'s (Alta) preliminary geotechnical investigation for the proposed Armstrong Ranch Specific Plan, located in the City of Ontario, California. The conclusions and recommendations presented in this report are based on Alta's recent subsurface investigation, laboratory testing, review of the Conceptual Site Grading Plan (Plate 1), and review of the referenced reports.

Alta's review of the data and site plan indicates that the proposed development is feasible, from a geotechnical standpoint, provided that the recommendations presented in this report are incorporated into the grading and improvement plans and implemented during site development. Included in this report are:

- Discussion of the site geotechnical conditions;
- Unsuitable soil removal and grading recommendations;
- Geotechnical site construction recommendations;
- Foundation design parameters.

If you have any questions or should you require any additional information, please contact the undersigned at (951) 509-7090. Alta appreciates the opportunity to provide geotechnical consulting services for your project.

Sincerely,
Alta California Geotechnical, Inc.

By:

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Distribution: (3) Addressee

SRG: SAG: MT: TJM: skt-1-0152, April 14, 2015 (Prelim Geo Investigation, Armstrong Ranch)

Table of Contents

1.0 INTRODUCTION

This report contains Alta California Geotechnical, Inc.'s (Alta's) findings, conclusions, and geotechnical recommendations for the development of the proposed Armstrong Ranch residential project.

1.1 Purpose

The purpose of this report is to examine the existing geotechnical conditions and evaluate their impact on the proposed residential development that is conceptually depicted on the enclosed site plan (Plate 1). This report is intended to be suitable for submittal to governing agencies and for use as a contractor bid document.

1.2 Scope of Work

Alta's *Scope of Work* for this geotechnical investigation includes the following:

- Reviewing the referenced reports pertinent to the subject site;
- Incorporating data generated from a previous field investigation and laboratory analyses conducted by GeoKinetics (2004) into this report;
- Excavating, logging, and sampling thirty (30) backhoe excavations to a maximum of 10.5 feet below the existing surface (Appendix B);
- Excavating, logging, and sampling four (4) hollow-stem auger excavations to a maximum of 10 feet below the existing surface (Appendix B);
- Conducting four (4) infiltration tests;
- Conducting laboratory testing on samples obtained during our investigation (Appendix C);
- Evaluating geologic and laboratory data to develop recommendations for site grading, foundations, and utilities;
- Preparing this report and accompanying exhibits.

1.3 Report Limitations

The conclusions and recommendations in this report are based on the information generated during this investigation, our review of the referenced reports, and our review of the conceptual site plan. The materials immediately adjacent to or beneath those observed may have different characteristics than those observed and no representations are made as to the quality or extent of materials not observed.

2.0 PROJECT DESCRIPTION

2.1 Site Location and Existing Conditions

The irregular-shaped, 112+-acre site is located southwest of the intersection of Riverside Drive and the Cucamonga Channel, in the City of Ontario. The site is bounded to the north by Riverside Drive, to the northeast by agricultural land, to the east by Cucamonga Channel, to the south by Chino Avenue, to the southwest by Vineyard Avenue, and to the northwest by agricultural land.

Past land use consisted of agriculture and dairy operations. A review of historic aerial photographs (Historic Aerials, 2015), indicates that the agricultural operations onsite extend at least as far back as 1938. The dairy operation started sometime between 1966 and 1980.

Dairy operations have ceased, but the infrastructure remains, including concrete feed lines, barns, concrete slabs, and fences. The southwest portion of the site is currently used for agricultural purposes. There is a truck storage yard in the proposed Planning Area 1. The single-family residential structures onsite are occupied and there are horse corrals in the southeast corner of the site.

2.2 Proposed Development

Approximately 624 residential lots with associated interior streets and infrastructure are proposed. A school site is proposed in the southeast corner of the property. Minimal slopes are proposed and are estimated to be less than 5 feet high.

3.0 SITE INVESTIGATION

3.1 Previous Subsurface Investigation and Laboratory Testing

Alta has reviewed the referenced preliminary geotechnical report by GeoKinetics. Twelve (12) hollow-stem auger borings, fifty (50) shallow hand auger borings (testing for organic content), and nine (9) backhoe test pits were excavated, logged, and sampled as part of their subsurface investigation. The locations of the hollow-stem auger borings and test pits are shown on the attached Plate 1 and the logs are presented in Appendix B-1 of this report. Laboratory test results, including the organic test results from the hand auger borings, are presented in Appendix C-1.

3.2 Current Subsurface Investigation

Alta conducted a subsurface investigation of the Armstrong Ranch property in March of 2015. The investigation consisted of the excavation, logging, and selective sampling of thirty (30) backhoe test pits and the drilling of four (4) hollow-stem auger borings to evaluate the infiltration characteristics of the native soils. The locations of the infiltration borings and test pits are shown on the attached Plate 1 and the logs are presented in Appendix B of this report.

Laboratory testing was performed on bulk samples obtained during the field investigation. A brief description of laboratory test procedures and the test results are presented in Appendix C.

Access to Planning Area 1 and the school site was not available at the time of our investigation. Further discussion of this issue is presented in Section 8.0.

4.0 GEOLOGIC CONDITIONS

4.1 Geologic and Geomorphic Setting

Regionally, the site is located in the Peninsular Ranges geomorphic province, which characterizes the southwest portion of southern California. The Peninsular Ranges province is composed of plutonic and metamorphic rock, lesser amounts of Tertiary volcanic and sedimentary rock, and Quaternary drainage in-fills and sedimentary veneers. The proposed project is located in the Riverside sub-block (Jennings and Bryant, 2010), which is bounded by the Elsinore fault zone to the west and by the San Jacinto fault zone to the east.

4.2 Stratigraphy

A digital preparation of geologic mapping by Morton and Miller (2003) depicts the Armstrong Ranch project to be underlain by middle Holocene age "Young alluvial-fan deposits." Thin veneers of topsoil cover a majority of the property. A stockpile of artificial fill exists along the south central property line. The pile is approximately 800 feet in length, 100 feet wide, and approximately 15 feet high at the tallest point. The geologic units are briefly described below. Their distribution is shown on enclosed Plate 1.

4.2.1 Artificial Fill - undocumented (map symbol afu)

The materials are composed of brown, fine grained silty sand with some cobbles in a dry and loose to dense condition.

4.2.2 Topsoil (no map symbol)

Topsoil blankets much of the site and has been disturbed by agricultural cultivation. Topsoil consists primarily of brown, moist, loose, fine silty sand. Organics, including mulch and manure, are present in the top one-half foot in some locations. The average thickness of the topsoil is one foot.

4.2.3 Young alluvial-fan deposits (map symbol Qyf)

Middle Holocene-aged surficial deposits, termed "Young alluvial-fan deposits" by Morton and Miller (2003), underlie the site. The deposits observed at the site consist primarily of fine-grained, silty sands and fine- to medium-grained sand. The unit is brown, gray, or yellowish brown, moist, and moderately dense.

4.3 Geologic Structure

4.3.1 Tectonic Framework

Jennings and Bryant (2010) defined eight structural provinces within California that have been classified by predominant regional fault trends and similar fold structure. These provinces are in turn divided into blocks and sub-blocks that are defined by “major Quaternary faults”. These blocks and sub-blocks exhibit similar structural features. Within this framework, the subject site is located within Structural Province I, which is controlled by the dominant northwest trend of the San Andreas Fault and is divided into two blocks, the Coast Range Block and the Peninsular Range Block. The Peninsular Range Block, on which this site is located, is characterized by a series of parallel, northwest trending faults that exhibit right lateral dip-slip movement. These faults are terminated by the Transverse Range block to the north and extend southward to the Baja Peninsula. These northwest trending faults divide the Peninsular Range block into eight sub-blocks. The Riverside Sub-block, one of the eight sub-blocks, is bound on the west by the Elsinore fault zone and on the east by the San Jacinto fault zone.

The site is located on the northwest portion of the Riverside sub-block, approximately 6.6 miles from the Chino-Central Avenue fault, 8.3 miles from the San Jose fault, 9.7 miles from the Cucamonga fault, 10.7 miles from the Sierra Madre fault, and 11.3 miles from the Elsinore fault. The property is not within an Alquist-Priolo earthquake fault zone.

4.3.2 Regionally Mapped Active Faults

Several other large, active fault systems, including the Whittier, San Jacinto, Sierra Madre and San Andreas faults, occur in the region surrounding the subject site. These fault systems have been studied extensively and in a large part control the geologic structure of southern California.

4.3.3 Geologic Structure

Based upon our site investigation and literature review, the onsite alluvial deposits have not been folded, faulted or fractured. The deposits are typically massive with erosion/infill contacts and repeating fining upwards sequences.

4.4 Groundwater

Groundwater was not encountered during this firm's subsurface investigation or by Geokinetics during their subsurface investigation in 2004. Groundwater in the vicinity is generally at a depth of approximately 190 feet, based on available data from a water well located approximately 2.5 miles from the site (Department of Water Resources, 2015).

4.5 Earthquake Hazards

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting a site are dependent on the distance to the causative fault and the intensity and magnitude of the seismic event. The seismic hazard may be primary, such as surface rupture and/or ground shaking, or secondary, such as liquefaction and/or ground lurching.

4.5.1 Local and Regional Faulting

The nearest active fault is the Chino-Central Avenue fault, which is located approximately 6.6 miles to the west. This fault has been identified as a Fault Rupture Hazard Zone by the State of California (Hart, 2007). "Active" faults have not been identified on the Armstrong ranch site, and therefore the probability of primary surface rupture or deformation at the site is considered unlikely.

Ground shaking hazards caused by earthquakes along the Chino fault and other active regional faults do exist. The 2013 California Building Code requires use-modified spectral accelerations and velocities for most structural designs. Seismic design parameters using soil profile types identified in the 2013 California Building Code are presented in Section 7.3.

4.5.2 Liquefaction

Seismic agitation of relatively loose saturated sands, silty sands, and some silts can result in a buildup of pore pressure. If the pore pressure exceeds the overburden stresses, a temporary quick condition known as liquefaction can occur. Liquefaction effects can manifest in several ways including: 1) loss of bearing; 2) lateral spread; 3) dynamic settlement; and 4) flow failure. Lateral spreading has typically been the most damaging mode of failure.

In general, the more recent that a sediment has been deposited, the more likely it will be susceptible to liquefaction. Other factors that must be considered are: groundwater, confining stresses, relative density, and the intensity and duration of seismically-induced ground shaking.

Due to the depth to groundwater (approximately 190 feet below the existing ground surface), the potential for liquefaction to occur based on the existing conditions is nil. There may be some potential for localized liquefaction if infiltration-type WQMP systems are utilized onsite. Further discussion of this potential is presented in Section 6.2.

4.5.3 Surface Rupture

Surface rupture is a break in the ground surface during or as a consequence of seismic activity. The potential for surface rupture at the site may be considered remote.

4.5.4 Seiches

A seiche is a free or standing-wave oscillation on the surface of water in an enclosed or semi-enclosed basin. The wave can be initiated by an earthquake and can vary in height from several centimeters to a few meters. The potential for a seiche impacting the property is considered to be non-existent.

4.5.5 Tsunami

A tsunami is a great sea wave produced by a submarine earthquake, landslide, or volcanic eruption. It is characterized by great speed of propagation and low observable amplitude on the open sea but can attain heights of several tens of feet upon encountering shallow water. Significant damage can occur along coastal areas subjected to such a wave. The site is not within the State of California Tsunami Inundation

Zone (Department of Conservation, 1997) due to the considerable distance from the coastline.

4.5.6 Dry Sand Settlement

Dry sand settlement is the process of non-uniform settlement of the ground surface during a seismic event. In consideration of the great depth of the groundwater and upon accomplishment of recommended removals, the potential for this type of settlement will be minimal.

4.5.7 Seismically Induced Landsliding

Due to a lack of slopes within or around the property seismically induced landsliding is not anticipated to pose a danger to the site.

5.0 ENGINEERING PROPERTIES AND ANALYSIS

5.1 Materials Properties

Presented herein is a general discussion of the engineering properties of the onsite materials that will be encountered during construction of the proposed project. Descriptions of the soil (Unified Soil Classification System) and in-place moisture/density results are presented on the boring logs in Appendix B.

5.1.1 Excavation Characteristics

Based on the data provided from the subsurface investigation, it is our opinion that the majority of the on-site materials possess favorable excavation characteristics.

5.1.2 Hydro-Consolidation

Hydro-consolidation is the effect of introducing water into soil that is prone to collapse. Upon loading and initial wetting, the soil structure and apparent strength are altered resulting in almost immediate settlement.

That settlement can have adverse impacts on engineered structures, particularly in areas where it is manifested differentially. Differential settlements are typically associated with differential wetting, irregularities in the subsurface soil conditions, or irregular loading patterns.

Based on a review of the previous testing conducted by Geokinetics (2004), there is a potential for hydro-collapse in the upper portions of the young alluvial fan deposit onsite. However, based on Alta's removal recommendations (Section 6.1.2), the potential for hydro-collapse to occur at the site will be low and within foundation design tolerances upon the completion of recommended unsuitable soil removals and recompaction.

5.1.3 Compressibility

The undocumented artificial fill and upper portions of the young alluvial fan deposits onsite are considered compressible and unsuitable to support the proposed improvements.

5.1.4 Expansion Potential

Expansion index testing was performed during the previous subsurface investigation (Geokinetics, 2004). Based on the results from the previous investigation, it is anticipated that the majority of materials onsite will vary in expansion potential from "low" to "medium".

5.1.5 Shear Strength Characteristics

Direct shear testing was performed during the previous subsurface investigation (Geokinetics, 2004) to assist in the development of shear strength characteristics of the onsite soils. The values presented in Table

5-1 are based on laboratory testing and our previous experience with similar geologic units.

TABLE 5-1 Shear Strength Characteristics		
Geologic Unit	Cohesion, C (psf)	Friction Angle, ϕ (degrees)
Engineered Artificial Fill	200	28

5.1.6 Earthwork Adjustments

The values presented in Table 5-2 are deemed appropriate for estimating purposes and may be used in an effort to balance earthwork quantities. As is the case with every project, contingencies should be made to adjust the earthwork balance when grading is in-progress and actual conditions are better defined.

TABLE 5-2 Earthwork Adjustment Factors		
Geologic Unit	Adjustment Factor Range	Recommended Average
Undocumented Artificial Fill/Topsoil	Shrink 12 to 16%	14%
Young alluvial fan Deposits	Shrink 8 to 12%	10%

5.1.7 Chemical Analyses

Chemical testing was performed during the previous subsurface investigation (Geokinetics, 2004), Soluble sulfate test results indicate that the soluble sulfate concentrations of the soils tested are classified as negligible per ACI 318-11 per the 2013 CBC (Category S0). Resistivity testing indicates that the soils are “severely corrosive" to buried metals (per Romanoff, 1989). Chloride concentrations of 69 ppm were detected onsite.

5.1.8 Pavement Support Characteristics

The onsite soils can be expected to provide moderate to good pavement support characteristics. Preliminary testing resulted in an R-Value of 62. Specific testing should be conducted upon completion of grading and be used as a basis for design of pavement.

5.2 Engineering Analysis

Presented below is a general discussion of the engineering analysis methods that were utilized to develop the conclusions and recommendations presented in this report.

5.2.1 Bearing Capacity and Lateral Earth Pressures

Ultimate bearing capacity values were obtained using the graphs and formula presented in NAVFAC DM-7.1. Allowable bearing was determined by applying a factor of safety of at least 3 to the ultimate bearing capacity. Static lateral earth pressures were calculated using Rankine methods for active and passive cases. If it is desired to use Coulomb forces, a separate analysis specific to the application can be conducted.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on Alta's findings during our subsurface investigation, the previous field investigation, the laboratory test results, our staff's previous experience in the area, and a review of the proposed site plan, it is Alta's opinion that the development of the site is feasible from a geotechnical perspective. Presented below are recommendations that should be incorporated into site development and construction plans.

6.1 General Earthwork Recommendations

All grading shall be accomplished under the observation and testing of the project geotechnical consultant in accordance with the recommendations contained herein and the City of Ontario criteria.

6.1.1 Demolition of Existing Improvements

Remnants of past site use such as feeding pens, fencing, and dairy structures should be demolished and removed from the site. Concrete may be crushed and reused in deeper (>10 feet below finish grade) fill areas, provided it is reduced in size such that the maximum dimension does not exceed the least dimension by more than two times and reinforcing steel is cut off at the face of the concrete.

6.1.2 Site Preparation

Vegetation, construction debris, manure, and other deleterious materials are unsuitable as structural fill material and should be disposed of off-site prior to commencing grading/construction.

6.1.3 Unsuitable Soil Removals

Presented below are the unsuitable soil removal recommendations for the onsite geologic units. Organics encountered in these units should be handled in accordance with the recommendations presented in Section 6.1.6. All removal bottoms should be observed by the Project Geotechnical Consultant in the field during grading to determine that suitable (non-weathered, limited porosity) soils have been exposed.

6.1.3.1 Artificial fill/Topsoil

The artificial fill/topsoil onsite is unsuitable to support the proposed fills and/or structures and should be removed and recompacted to project specifications. Removal bottoms should be observed by the Project Geotechnical Consultant in the field during grading to finally determine the depth of unsuitable soil removals.

6.1.3.2 Young alluvial fan deposits

The upper portions of the "Young alluvial fan deposits" are unsuitable to support the proposed fills and/or structures and should be removed and recompacted to project specifications. It is anticipated that the upper 4 to 5 feet of these deposits will require removal and recompaction. Removal bottoms should be observed by the Project Geotechnical Consultant in the field during grading to finally determine the depth of unsuitable soil removals.

6.1.4 Over-excavation

Lots should be underlain by a minimum of three (3) feet of compacted fill. As such, cut lots and the cut portion of transition lots should be over-excavated a minimum of three (3) feet in areas where the recommended removals do not provide the minimum amount of compacted fill. Over-excavations should be observed and approved by the Project Geotechnical Consultant in the field during grading.

6.1.5 Compaction Standards

All fill and processed natural ground shall be compacted to a minimum relative compaction of 90 percent, as determined by ASTM Test Method: D-1557. Fill material should be moisture conditioned to optimum moisture or above, and as generally discussed in Alta's Earthwork Specification Section presented in Appendix E. Compaction shall be achieved with the use of sheepsfoot rollers or similar kneading type equipment. Mixing and moisture conditioning will be required in order to achieve the recommended moisture conditions.

6.1.6 Organic Content

The amount of organic material that can be incorporated into fills should be limited. Geokinetics (2004) performed organic testing on the onsite soils in the project and the results are presented in Appendix C-1. The test results indicate that a majority of soils have an organic concentration of <1%.

Soils with organic concentrations greater than 1% can either be: 1) removed from the site; or 2) blended with soils with limited to no organics. This blending can be accomplished by repeatedly corner-plowing the material with a dozer as well as discing the material with a tractor-drawn disc. After blending, the soils can be disposed of in structural fill areas throughout the site at a rate of approximately 1 scraper load of blended material for each 10 scrapers loads of fill material placed. Once fill material is placed in structural fill areas, it should be thoroughly mixed with a tractor-drawn disc, brought to above optimum moisture content, and compacted in-place to project specifications.

Periodic observation pits should be excavated during the rough grading. If any concentration of organics are detected during the excavation of the observation pits or compaction test pits, the area should be completely removed or re-mixed until no concentrations of organics are present.

Limited concentrations of manure were observed onsite and were primarily within the upper one foot of the topsoil. If large concentrations of manure are encountered during grading, this material will likely need to be disposed of offsite.

6.1.7 Groundwater/Seepage

It is anticipated that groundwater will not be encountered during grading/construction. It is possible that perched water conditions could be encountered depending on the time of year construction occurs.

6.1.8 Documentation of Removals

All removal/overexcavation bottoms should be observed and approved by the project Geotechnical Consultant prior to fill placement. Removal bottoms and undercuts should be surveyed after approval by the geotechnical consultant prior to the placement of fill. Staking should be provided in order to verify undercut locations and depths.

6.1.9 Treatment of Removal Bottoms

At the completion of removals/over-excavation, the exposed removal bottom should be ripped to a minimum depth of eight inches, moisture-conditioned to above optimum moisture content and compacted in-place to the project standards.

6.1.10 Fill Placement

After removals, scarification, and compaction of in-place materials are completed, additional fill may be placed. Fill should be placed in eight-inch bulk maximum lifts, moisture conditioned to optimum moisture content or above, compacted and tested as grading/construction progresses until final grades are attained.

6.1.11 Benching

Where the natural slope is steeper than 5-horizontal to 1-vertical and where designated by the project Geotechnical Consultant, compacted fill material shall be keyed and benched into competent bedrock or firm artificial fill.

6.1.12 Mixing

Mixing of materials may be necessary to prevent layering of different soil types and/or different moisture contents. The mixing should be accomplished prior to and as part of compaction of each fill lift.

6.1.13 Import Soils

Import soils, if necessary, should consist of clean, low expansive, structural quality, compactable materials similar to the on-site soils and should be free of trash, debris or other objectionable materials. The project Geotechnical Consultant should be notified not less than 72 hours in advance of the locations of any soils proposed for import. Import sources should be sampled, tested, and approved by the project Geotechnical Consultant at the source prior to the importation of the soils to the site. The project Civil Engineer should include these requirements on plans and specifications for the project.

6.1.14 Fill Slope Construction

Fill slopes should be overfilled to an extent determined by the contractor, but not less than two (2) feet measured perpendicular to the slope face, so that when trimmed back to the compacted core a minimum 90 percent relative compaction is achieved.

Compaction of each fill lift should extend out to the temporary slope face. Back-rolling during mass filling at intervals not exceeding four (4) feet in height is recommended, unless more extensive overfilling is undertaken.

As an alternative to overfilling, fill slopes may be built to the finish slope face in accordance with the following recommendations:

1. Compaction of each fill lift should extend to the face of the slopes.
2. Back-rolling during mass grading should be undertaken at intervals not exceeding four (4) feet in height. Back-rolling at more frequent intervals may be required.
3. Care should be taken to avoid spillage of loose materials down the face of any slopes during grading. Spill fill will require complete removal prior to compaction, shaping, and grid rolling.

4. At completion of mass filling, the slope surface should be watered, shaped, and compacted by track walking with a D-8 bulldozer, or equivalent, such that compaction to project standards is achieved to the slope face.

Proper seeding and planting of the slopes should follow as soon as practical to inhibit erosion and deterioration of the slope surfaces. Proper moisture control will enhance the long-term stability of the finish slope surface.

6.1.15 Utility Trenches

6.1.15.1 Excavation

Utility trenches should be supported, either by laying back excavations or shoring, in accordance with applicable OSHA standards. In general, existing site soils are classified as Soil Types "B" and "C" per OSHA standards. Upon completion of the recommended removals and recompaction, the artificial fill will be classified as Soil Type "B". The Project Geotechnical Consulting should be consulted if geologic conditions vary from what is presented in this report. Flatter backcuts or shoring may be required depending on the depth of the utility lines.

6.1.15.2 Backfill

Trench backfill should be compacted to at least 90 percent of maximum dry density as determined by ASTM D-1557. Onsite soils will not be suitable for use as bedding material but will be suitable for use in backfill provided oversized materials are removed. No surcharge loads should be imposed above excavations. This includes spoil piles, lumber, concrete trucks, or other construction materials and equipment. Drainage above excavations should be directed away from the banks. Care should be taken to avoid saturation of the soils. Compaction should be accomplished by mechanical means. Jetting of native soils will not be acceptable.

6.1.16 Backcut Stability

Temporary backcuts, if required during unsuitable soil removals, should be made no steeper than 1:1 without review and approval of the geotechnical consultant. Flatter backcuts may be necessary where geologic conditions dictate and where minimum width dimensions are to be maintained.

Care should be taken during remedial grading operations in order to minimize risk of failure. Should failure occur, complete removal of the disturbed material will be required.

In consideration of the inherent instability created by temporary construction backcuts for stabilization fills and removals, it is imperative that grading schedules are coordinated to minimize the unsupported exposure time of these excavations. Once started these excavations and subsequent fill operations should be maintained to completion without intervening delays imposed by avoidable circumstances. In cases where five-day workweeks comprise a normal schedule, grading should be planned to avoid exposing at-grade or near-grade excavations through a non-work weekend. Where improvements may be affected by temporary instability, either on or offsite, further restrictions such as slot cutting, extending work days, implementing weekend schedules, and/or other requirements considered critical to serving specific circumstances may be imposed.

6.2 Infiltration Type WQMP Systems

It is Alta's understanding that infiltration basins are going to be utilized onsite for storm water control. Alta will prepare an infiltration study report utilizing the testing conducted as part of our investigation once the design is available. However, it should be noted that utilization of infiltration-type systems onsite could increase the potential for localized liquefaction around the basins. Post-tensioned slabs may be recommended for structures adjacent to the basins.

6.3 Methane Testing

Preliminary methane testing was discussed as part of the previous Phase 1 environmental report (GeoKinetics, 2012). Elevated levels of methane were detected in six of the forty-two probe locations onsite. Based on City of Ontario specifications, it should be anticipated that a post-grading methane study will need to be conducted onsite. Methane mitigation measures, such an enhanced vapor barriers or vent lines may be necessary if levels exceed controlling authority limits.

7.0 DESIGN CONSIDERATIONS

7.1 Structural Design

It is anticipated that a one to two-story, wood-frame and masonry residential structure with slab on-grade and shallow foundations will be constructed. Upon the completion of rough grading, finish grade samples should be collected and tested in order to provide specific recommendations as they relate to the individual building pad. These test results and corresponding design recommendations should be presented in a final rough grading report. Final slab and foundation design recommendations should be made based upon specific structure sitings, loading conditions, and as-graded soil conditions.

It is anticipated that the majority of onsite soils will possess "low" to "medium" expansion potential when tested in general accordance with ASTM Test Method D: 4829. Recommendations for conventional and post-tensioned slabs/foundation systems are presented below. As discussed in Section 6.3, post-tensioned slabs may be recommended for structures in the vicinity of infiltration-type WQMP systems.

7.1.1 Foundations

Foundations may be preliminary designed based on the values presented in Table 7-1 below.

Table 7-1
Foundation Design Parameters*

Allowable Bearing	2000 lbs/ft^2
Lateral Bearing	250 lbs/ft^2 at a depth of 12 inches plus 250 lbs/ft^2 for each additional 12 inches of embedment to a maximum of 2000 lbs/ft^2
Sliding Coefficient	0.30
Differential Settlement	Dynamic: Differential = 1 inch in 40 feet Static: Differential = 0.75 inch in 40 feet

*These values may be increased as allowed by Code to resist transient loads such as wind or seismic. Building code and structural design considerations may govern depth and reinforcement requirements and should be evaluated.

7.1.2 Conventional Foundation Systems

Based on the onsite soils conditions and information supplied by the CBC 2013, conventional foundation systems may be designed in accordance with Tables 7-1 and 7-2.

TABLE 7-2
CONVENTIONAL FOUNDATION DESIGN PARAMETERS

Expansion Potential	*Very Low to Low*	*Medium*
Soil Category	I	II
Design Plasticity Index	10	20
Minimum Outer Footing Embedment	12 inches*	18 inches*
*The minimum footing embedments presented herein are based on expansion indexes. The structural engineer should determine minimum embedments based on the number of floors supported by the footings, the structural loading, and the requirements of the latest California Building Code.		
Minimum Footing Width	12-inches-The structural engineer should determine the minimum footing width based on loading and the latest California Building Code.	
Footing Reinforcement	No. 4 rebar, one (1) on top, one (1) on bottom	No. 4 rebar, one (1) on top, one (1) on bottom
Slab Thickness	4 inches (actual)	4 inches (actual)
Slab Reinforcement	No. 3 rebar spaced 18 inches on center, each way	No. 3 rebar spaced 15 inches on center, each way
Under-Slab Requirement	See Section 7.2	See Section 7.2
Slab Subgrade Moisture	Minimum of 110 percent of optimum moisture to a depth of 12 inches prior to placing concrete.	Minimum of 120 percent of optimum moisture to a depth of 12 inches prior to placing concrete.
Footing Embedment Adjacent to Swales and Slopes	If exterior footings adjacent to drainage swales are to exist within five (5) feet horizontally of the swale, the footing should be embedded sufficiently to assure embedment below the swale bottom is maintained. Footings adjacent to slopes should be embedded such that at least five- (5) feet is provided horizontally from edge of the footing to the face of the slope.	
Garages	A grade beam reinforced continuously with the garage footings shall be constructed across the garage entrance, tying together the ends of the perimeter footings and between individual spread footings. This grade beam should be embedded at the same depth as the adjacent perimeter footings. A thickened slab, separated by a cold joint from the garage beam, should be provided at the garage entrance. Minimum dimensions of the thickened edge shall be six (6) inches deep. Footing depth, width and reinforcement should be the same as the structure. Slab thickness, reinforcement and under-slab treatment should be the same as the structure.	

7.1.3 Post-Tensioned Slabs/Foundation Design Recommendations

Post-tensioned slabs for the project may be preliminarily designed utilizing the parameters presented in Tables 7-1 and 7-3. The parameters presented herein are based on methodology provided in the Design of Post-Tensioned Slabs-On-Ground, Third Edition, by the Post-Tensioning Institute, in accordance with the 2013 CBC.

<table>
<tr><th colspan="7">TABLE 7-3
POST-TENSION SLAB DESIGN PARAMETERS</th></tr>
<tr><th rowspan="2">Category</th><th rowspan="2">Expansion Potential</th><th rowspan="2">Minimum Embedment*</th><th colspan="2">Edge Lift</th><th colspan="2">Center Lift</th></tr>
<tr><th>Em (ft)</th><th>Ym (inch)</th><th>Em (ft)</th><th>Ym (inch)</th></tr>
<tr><td>I</td><td>Low</td><td>12 inches</td><td>5.4</td><td>0.61</td><td>9.0</td><td>0.26</td></tr>
<tr><td>II</td><td>Medium</td><td>18 inches</td><td>5.2</td><td>1.10</td><td>9.0</td><td>0.46</td></tr>
<tr><th colspan="7">Slab Subgrade Moisture</th></tr>
<tr><td colspan="2">Category I</td><td colspan="5">Minimum 110% of optimum moisture to a depth of 12 inches prior to pouring concrete</td></tr>
<tr><td colspan="2">Category II</td><td colspan="5">Minimum 120% of optimum moisture to a depth of 12 inches prior to pouring concrete</td></tr>
<tr><td colspan="7">Embedment*
The minimum footing embedments presented herein are based on expansion indexes. The structural engineer should determine minimum embedments based on the number of floors supported by the footings, the structural loading, and the requirements of the latest California Building Code. If mat slabs are utilized, alternate embedment depths can be provided.</td></tr>
<tr><td colspan="7">Moisture Barrier
A moisture barrier should be provided in accordance with the recommendations presented in Section 7.2</td></tr>
<tr><td colspan="7">The parameters presented herein are based on procedures presented in the <u>Design of Post-Tensioned Slabs-On-Ground, Third Edition</u>. No corrections for vertical barriers at the edge of the slab, or for adjacent vegetation have been assumed. The design parameters are based on a Constant Suction Value of 3.9 pF.</td></tr>
</table>

7.2 Moisture Barrier

A moisture and vapor retarding system should be placed below the slabs-on-grade in portions of the structure considered to be moisture sensitive and should be capable of effectively preventing the migration of water and reducing the transmission of water vapor to acceptable levels. Historically, a 10-mil plastic membrane, such as Visqueen, placed between one to four inches of clean sand, has been used for this purpose. The use of this system or other systems can be considered, at the discretion of the designer, provided the system reduces the vapor transmission rates to acceptable levels.

7.3 Seismic Design

The following seismic design parameters are presented to be code compliant to the California Building Code (2013). The site has been identified as "D" site class in accordance with CBC, 2013, Table 1613.5.3 (1). Utilizing this information, the computer program USGS Seismic Design Maps Version 3.1.0 and ASCE 7-10 criterion, the spectral response accelerations are as follows.

Table 7-3
Seismic Design Parameters
Latitude 34.0156° N and Longitude -117.6059° W

Ss (period 0.2 sec)	1.500
SMs (period 0.2 sec)	1.500
SDs (period 0.2 sec)	1.000
S1 (period 1.0 sec)	0.600
SM1 (period 1.0 sec)	0.900
SD1 (period 1.0 sec)	0.600

These parameters should be verified by the structural engineer. Additional parameters should be determined by the structural engineer based on the Occupancy Category of the proposed structures.

7.4 Retaining Wall Design

Retaining walls should be founded on compacted fill and should be backfilled with granular soils that allow for drainage behind the wall. Foundations may be designed in accordance with the recommendations presented in Table 7-1, above. Unrestrained walls, free to rotate at least 0.001 radians, may be designed to resist lateral pressures imposed by a fluid with a unit weight determined in accordance with the Table 7-4 below. The table also presents design parameters for restrained (at-rest) retaining walls. These parameters may be used to design retaining walls that may be considered as restrained due to the method of construction or location (corner sections of unrestrained retaining walls).

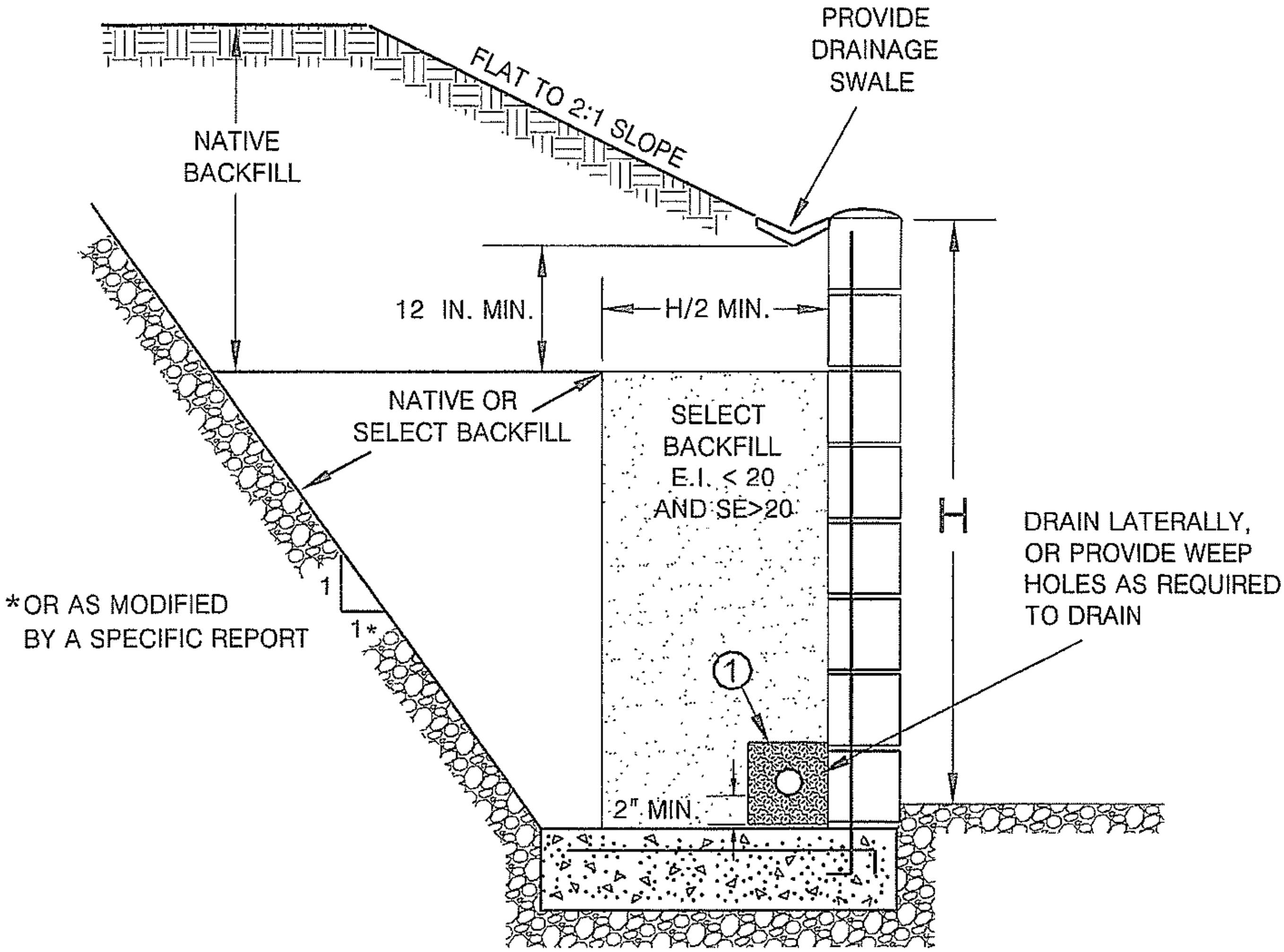
TABLE 7-4
Equivalent Fluid Pressures for 90% Compacted Fill
(γ =125 psf, Φ= 32)

Backfill	Active (psf/ft)	At-Rest (psf/ft)
Level	38	59
2:1	59	106

Per the requirements of the 2013 CBC, the seismic force acting on the retaining walls may be resolved utilizing the formula $19H^2$ lb/lineal ft (H=height of the wall). This force acts at approximately 0.67H above the base of the wall.

- Restrained retaining walls should be designed for “at-rest” conditions.
- The design loads presented in the above table are to be applied on the retaining wall in a horizontal fashion and as such friction between wall and retained soils should not be allowed in the retaining wall analyses.
- Additional allowances should be made in the retaining wall design to account for the influence of construction loads, temporary loads, and possible nearby structural footing loads.
- Select backfill should be granular, structural quality backfill with a Sand Equivalent of 20 or better and an ASCE Expansion Index of 20 or less. The backfill must encompass the full active wedge area; otherwise, the values presented in the Native Backfill column must be used for the design. Native backfill should have an ASCE Expansion Index of 50 or less. The upper one foot of backfill should be comprised of native on-site soils (see Plate A).
- The wall design should include waterproofing (where appropriate) and backdrains or weep holes for relieving possible hydrostatic pressures. The backdrain should be comprised of a 4-inch perforated PVC pipe in a 1 ft. by 1 ft., ¾-inch gravel matrix, wrapped with a geofabric. The backdrain should be installed with a minimum gradient of 2 percent and should be outletted to an appropriate location.

RETAINING WALL BACKFILL DETAIL



1

PIPE: 4-INCH PERFORATED PVC, SCHEDULE 40, SDR35 OR APPROVED ALTERNATE MINIMUM 8 PERFORATIONS (1/4-IN. DIA.) PER LINEAL FT. IN BOTTOM HALF OF PIPE

ROCK: MINIMUM VOLUME OF 1 CU. FT. OF 3/4-IN. MAX. ROCK PER. LINEAL FOOT OF PIPE, OR APPROVED ALTERNATE

FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT

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PLATE A

PATH:S:\Drafting\ALTA GEOTECHNICAL\GRADING DETAILS\PLATE A.dwg

- No backfill should be placed against concrete until minimum design strengths are achieved in compression tests of cylinders.

It should be noted that the allowable bearing and passive resistance values presented in Table 7-1 are based on level conditions at the toe. Modified design parameters can be presented for retaining walls with descending slope conditions at the toe.

7.5 Fence and Garden Walls

Block walls, if used, should be embedded a minimum of 2 feet below the lowest adjacent grade. In the vicinity of descending slopes, the foundations should be embedded to provide for a minimum distance of H/6 (where H is the height of the slope) from the face of the slope to the outside edge of the bottom of the footing (to a maximum of 20 feet).

Construction joints (not more than 20 feet apart) should be included in the block wall construction. Side yard walls should be structurally separated from the rear yard wall.

7.6 Footing Excavations

Soils from the footing excavations should not be placed in slab-on-grade areas unless properly compacted and tested. The excavations should be cleaned of all loose/sloughed materials and be neatly trimmed at the time of concrete placement.

7.7 Exterior Slabs and Walkways

Exterior concrete slabs and walkways should be designed and constructed in consideration of the following recommendations.

7.7.1 Subgrade Compaction

The subgrade below exterior concrete slabs should be compacted to a minimum of 90 percent relative compaction as determined by ASTM Test Method: D 1557.

7.7.2 Subgrade Moisture

The subgrade below concrete slabs should be moisture conditioned to a minimum of 110 percent of optimum moisture content (low expansion) or 120 percent of optimum moisture (medium expansion) prior to concrete placement.

7.7.3 Concrete Slab Thickness

Concrete flatwork and driveways should be designed utilizing four-inch minimum thickness.

7.7.4 Concrete Slab Reinforcement

Utilization of reinforcement for flatwork and driveways is subject to a cost/benefit analysis. Reinforcement will decrease the amount of cracking that may occur in flatwork, however, planning for occasional repairs may be more cost effective. Utilizing closely spaced control joints is likely more cost-effective than utilizing reinforcement. The majority of the soils onsite are classified as low to medium in expansion potential. Consideration should be given to reinforcing flatwork with irregular (non-square/rectangular) shapes.

7.7.5 Control Joints

Weakened plane joints should be installed on walkways at intervals of approximately eight feet (maximum) or less. Exterior slabs should be designed to withstand shrinkage of the concrete.

7.8 Concrete Design

As stated in Section 5.1.6, negligible concentrations of sulfates were detected in the onsite soils. Therefore, the use of sulfate resistant concrete is not required per ACI 318-11. Post-grading conditions should be evaluated and final recommendations made at that time.

7.9 Corrosion

Based on preliminary testing, the onsite soils are corrosive to buried metal objects. Buried ferrous metals should be protected against the effects of corrosive soils in accordance with the manufacture's recommendations. Typical measures may include using non-corrosive backfill, protective coatings, wrapping, plastic pipes, or a combination of these methods. A corrosion engineer should be consulted if specific design recommendations are required by the improvement designer.

Per ACI 318-11, an exposure class of C1 would be applicable to metals encased in concrete (rebar in footings) due to being exposed to moisture from surrounding soils.

7.10 Pavement Design

Pavement sections for the proposed streets should be designed based on laboratory testing conducted on samples taken from the soil subgrade. Preliminarily, based on an assumed R-Value of 50 and a traffic index of 5.5, the streets may be designed utilizing a pavement section of 4-inches of asphalt over 6-inches of aggregate base (City of Ontario minimum). This section should be verified upon the completion of grading, based on R-Value testing.

Construction of the streets should be accomplished in accordance with the current criteria of the City of Ontario and under the observation and testing of the Project Geotechnical Consultant.

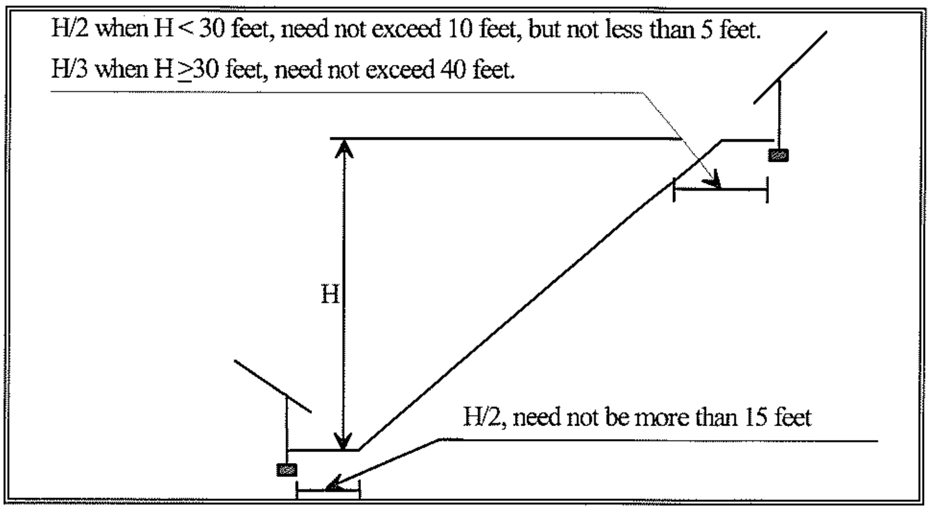
Prior to the placement of base material, the subgrade should be suitably moisture conditioned, processed and compacted to a minimum 95 percent of the laboratory maximum density (ASTM: D 1557) to at least twelve (12) inches below subgrade. After subgrade compaction, the exposed grade should then be "proof"-rolled with heavy equipment to ensure the grade does not "pump" and is verified as non-yielding. Aggregate base material should be placed on the compacted subgrade and compacted in-place to a minimum 95 percent of the laboratory standard obtained per ASTM: D 1557.

7.11 Site Drainage

Positive drainage away from the proposed structures should be provided and maintained. Roof, pad and lot drainage should be collected and directed away from the structures toward approved disposal areas through drainage terraces, gutters, down drains, and other devices. Design fine grade elevations should be maintained through the life of the structure or if design fine grade elevations are altered, adequate area drains should be installed in order to provide rapid discharge of water, away from structures. Residents or Homeowner Associations should be made aware that they are responsible for maintenance and cleaning of all drainage terraces, down drains, and other devices that have been installed to promote site and structure drainage.

7.12 Deepend Footings and Setbacks

It is generally recognized that improvements constructed in proximity to properly constructed slopes can, over a period of time, be affected by natural processes including gravity forces, weathering of surficial soils and long term (secondary) settlement. Most building codes, including the California Building Code (CBC), require that structures be set back or footings deepened, where subject to the influence of these natural processes. For the subject site, where foundations for residential structures are to exist in proximity to slopes, the footings should be embedded to satisfy the requirements presented in the following figure.



Consideration of these natural processes should be undertaken in the design and construction of other improvements. Homeowners are advised to consult with qualified geotechnical engineers, designers, and contractors in the design and construction of future improvements. Each lot and proposed improvement should be evaluated in relation to the specific site conditions, accounting for the hillside nature and specific soil conditions. Suggested homeowner and improvement considerations are provided in the Appendix of this report.

8.0 FUTURE PLAN REVIEWS

This report represents a geotechnical review of the conceptual site plan. As the project design progresses, site specific geologic and geotechnical issues should be considered in the design and construction of the project. Consequently, future plan reviews may be necessary. These reviews may include reviews of:

- Grading Plans
- Foundation Plans
- Utility Plans

These plans should be forwarded to the project Geotechnical Consultant for review.

As noted in Section 3.2, the proposed P.A. 1 and school site areas were not accessible during the current or previous subsurface investigations. It is anticipated that similar geotechnical conditions as to what was encountered throughout the remainder of the site will be present. As such, from a preliminary planning/design standpoint, the recommendations presented herein are suitable for use in these areas. However, a subsurface investigation and subsequent laboratory testing should be conducted in these areas to verify that the recommendations contained herein are suitable.

9.0 CLOSURE

9.1 Geotechnical Review

For the purposes of this report, multiple working hypotheses were established for the project, utilizing the available data and the most probable model is used for the analysis. Future information collected during the proposed grading operations is intended to evaluate the hypothesis and as such, some of the assumptions summarized in this report may need to be changed. Some modifications of the grading recommendations may become necessary, should the conditions encountered in the field differ from the conditions hypothesized in this report.

Plans and sections of the project specifications should be reviewed by Alta, to evaluate conformance with the intent of the recommendations contained in this report. If the project description or final design varies from that described in herein, Alta must be consulted regarding the applicability of the recommendations contained herein and whether any changes are required. Alta accepts no liability for any use of its recommendations if the project description or final design varies and Alta is not consulted regarding the alterations.

9.2 Limitations

This report is based on the following: 1) the project as presented on the attached plan; 2) the information obtained from the subsurface investigation at the approximate locations indicated on the plan included herein; 3) laboratory test results; and 4) from the information presented in the referenced reports. The findings and recommendations are based on the results of the subsurface investigation, laboratory testing, and office analysis combined with an interpolation and extrapolation of conditions between and beyond the subsurface excavation locations. However, the materials adjacent to or beneath those observed may have different characteristics than those observed and no precise representations are made as to the quality or extent of the materials not observed. The findings are also based on information from previous investigations/geotechnical reports contained in the references. The results reflect an interpretation of the direct evidence obtained. Work performed by Alta has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing in the same locality under similar conditions. No other representation, either expressed or implied, and no warranty or guarantee is included or intended.

The recommendations presented in this report are based on the assumption that an appropriate level of field review will be provided by a geotechnical consultant who is familiar with the design and site geologic conditions. That field review shall be sufficient to confirm that geotechnical and geologic conditions exposed during grading are consistent with the geologic representations and corresponding recommendations presented in this report.

The conclusions and recommendations included in this report are applicable to the specific design of this project as discussed in this report. They have no applicability to any other project or to any other location and any and all subsequent users accept any and all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of Alta.

Alta has no responsibility for construction means, methods, techniques, sequences, procedures, safety precautions, programs in connection with the construction, acts or omissions of the CONTRACTOR or any other person performing any of the construction, or for the failure of any of them to carry out the construction in accordance with the final design drawings and specifications.

APPENDIX A

REFERENCES

APPENDIX A

Selected References

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APPENDIX B

Subsurface Investigation

APPENDIX B

Subsurface Investigation

Alta's subsurface investigation consisted of excavating, logging, and sampling thirty (30) backhoe test pits and four (4) hollow-stem auger borings. Details of the subsurface investigation are presented in Table B. The approximate locations of the exploratory excavations are shown on the accompanying site plan (Plate 1) and the Geotechnical Logs are attached. In-situ density/moisture testing was conducted utilizing a nuclear test gauge. The results are presented in Table B-1.

TABLE B
SUBSURFACE INVESTIGATION DETAILS

Equipment	Range of Depths	Sampling Methods	Sample Locations
Backhoe	5 to 10.5 feet	1. Bulk	1. Bulk-Select Depths
Hollow-Stem Auger	10 feet	1. Ring Sampler	1. Ring-Select Depths

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		grf	ltr	Description
Coarse Grained Soils More than 50% retained on No. 200 sieve	Gravel and Gravelly Soils More than 50% of coarse fraction retained on No,. 4 sieve		GW	Well-graded gravels or gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels or gravel sand mixture, little or no fines
			GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and Sandy Soils More than 50% of coarse fraction passes on No,. 4 sieve		SW	Well-graded sands or gravelly sands, little or no fines
			SP	Poorly-graded sands or gravelly sands, little or no fines
			SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, and-clay mixtures

Major Divisions		grf	ltr	
Fine Grained Soils More than 50% passes on No. 200 sieve	Silts And Clays LL,<50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silt-clays of low plasticity
	Silts And Clays LL,<50		MH	Inorganic silts, micaceous or diatomaceous fine or silty soils, elastic silts
			VH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
Highly Organic Soils			PT	Peat and other highly organic soils

BOUNDARY CLASSIFICATION: Soils possessing characteristics of two groups are designated by combinations of group symbols.

PARTICLE SIZE LIMITS

U.S. STANDARD SERIES SIEVE — 200, 40, 10, 4; CLEAR SQUARE SIEVE OPENINGS — 3/4", 3", 12"

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		

RELATIVE DENSITY

Sands and Gravels	Blows/Foot (SPT)
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

CONSISTENCY CLASSIFICATION

Silts and Clays	Criteria
Very Soft	Thumb penetrates soil >1 in.
Soft	Thumb penetrates soil 1 in.
Firm	Thumb penetrates soil 1/4 in.
Stiff	Readily indented with thumbnail
Very Stiff	Thumbnail will not indent soil

HARDNESS

Bedrock
Soft
Moderately Hard
Hard
Very Hard

LABORATORY TESTS

Symbol	Test
DS	Direct Shear
DSR	Direct Shear (Remolded)
CON	Sieve Analysis
SA	Maximum Density
MAX	Resistance (R) Value
RV	Expansion Index
EI	Sand Equivalent
SE	Atterberg Limits
AL	Chemical Analysis
CHEM	Hydrometer Analysis
HY	

SOIL MOISTURE

Increasing Visual Moisture Content

- Dry - Dry to touch
- Moist - Damp, but no visible free water
- wet - Visible free water

SIZE PROPORTIONS

Trace - <5%

Few - 5 to 10%

Some - 15 to 25%

KEY TO EXPLORATORY BORING LOGS

G1-46

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PLATE B

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0152	PROJECT NAME	Armstrong Ranch
DATE STARTED	3/23/15	GROUND ELEV.	
DATE FINISHED	3/23/15	GW DEPTH (FT)	
DRILLER	Martini drilling	DRIVE WT.	140 lbs.
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 in.

BORING DESIG. P-1
LOGGED BY MT
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL**: SILTY SAND, fine grained, dark brown, dry to damp, loose.				
					SM	**YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, dark brown, moist, loose.				
5		R	8			@5 ft. dark yellow brown, trace gravel.				
10		R	13			@10 ft. gravel.				
						TOTAL DEPTH 10 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE
T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0152

PLATE P-1

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0152	PROJECT NAME	Armstrong Ranch
DATE STARTED	3/23/15	GROUND ELEV.	
DATE FINISHED	3/23/15	GW DEPTH (FT)	
DRILLER	Martini drilling	DRIVE WT.	140 lbs.
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 in.

BORING DESIG. P-2
LOGGED BY MT
NOTE

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL**: SILTY SAND, fine grained, dark brown, dry to damp, loose.				
					SM	**YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, dark yellow brown, moist, loose, trace gravel.				
5		R	7			@5 ft. brown				
10		R	17			@10 ft. medium dense, some gravel.				
						TOTAL DEPTH 10 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
R RING (DRIVE) SAMPLE
S SPT (SPLIT SPOON) SAMPLE
B BULK SAMPLE T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0152 PLATE P-2

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0152	PROJECT NAME	Armstrong Ranch		
DATE STARTED	3/23/15	GROUND ELEV.		BORING DESIG.	P-3
DATE FINISHED	3/23/15	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	Martini drilling	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL**: SILTY SAND, fine grained, dark brown, dry to damp, loose.				
					SM	**YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, yellow brown, slightly moist.				
5		R	14			@5 ft. moist, few gravel, found a piece of broken rock approximately 2 inches in diameter.				
10		R	33		SP	@10 ft. SAND, fine to medium grained, yellow brown, moist, medium dense, some gravel.				
						TOTAL DEPTH 10 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

GROUNDWATER
SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0152 PLATE P-3

GEOTECHNICAL BORING LOG

PROJECT NO.	1-0152	PROJECT NAME	Armstrong Ranch		
DATE STARTED	3/23/15	GROUND ELEV.		BORING DESIG.	P-4
DATE FINISHED	3/23/15	GW DEPTH (FT)		LOGGED BY	MT
DRILLER	Martini drilling	DRIVE WT.	140 lbs.	NOTE	
TYPE OF DRILL RIG	Hollow stem auger	DROP	30 in.		

DEPTH (Feet)	ELEV	SAMPLE TYPE	BLOWS	LITHOLOGY	GROUP SYMBOL	GEOTECHNICAL DESCRIPTION	MOISTURE CONT (%)	DRY (pcf) DENSITY	SAT-URATION (%)	OTHER TESTS
					SM	**TOPSOIL**: SILTY SAND, fine grained, light tan, dry to damp, loose.				
					SM	**YOUNG ALLUVIAL FAN DEPOSITS** (Qyf): SILTY SAND, fine grained, light tan brown, damp to moist, some gravel.				
5		R	35			@5 ft. dark tan brown, moist, dense, few rocks.				
10		R	23		SP	@10 ft. SAND, fine to medium grained, dark tan, moist, dense, gravel up to 3" in diameter.				
						TOTAL DEPTH 10 FEET NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED				

SAMPLE TYPES:
- R RING (DRIVE) SAMPLE
- S SPT (SPLIT SPOON) SAMPLE
- B BULK SAMPLE
- T TUBE SAMPLE

▼ GROUNDWATER
► SEEPAGE
J: JOINTING C: CONTACT
B: BEDDING F: FAULT
S: SHEAR RS: RUPTURE SURFACE

Alta California Geotechnical, Inc.

P.N. 1-0152 PLATE P-4

Project No.	1-0152
Date Excavated	March 18, 2015
Excavated by	SG
Equipment	JD 410J

TABLE I

LOG OF TEST PITS

Test Pit No.	Depth (ft.)	USCS	Description
T-1	0.0-1.0	SM	**TOPSOIL:** Very fine, SILTY SAND, dark brown, moist, medium dense.
	1.0-9.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained, SILTY SAND, brown, moist, friable.
	9.0-10.0	SP	Fine to medium SAND, trace SILT, light brown, moist, friable, some cobbles, rounded.
			TOTAL DEPTH 10.0 FT NO GROUNDWATER ENCOUNTERED CAVING OBSERVED 0-10 FT

Test Pit No.	Depth (ft.)	USCS	Description
T-2	0.0-3.5	SM	**TOPSOIL:** Fine grained, SILTY SAND, moist, medium dense, organic smell, some pebbles, some trash and debris. @ 0-1-ft. brown @ 2-3-ft. dark gray
	3.5-6.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained, SILTY SAND, gray brown, moist, dense, trace pebbles.
			TOTAL DEPTH 6.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-3	0.0-4.0	SM	**ARTIFICIAL FILL (afu):** Fine grained, SILTY SAND, moist, moderately dense, concrete pipe, trace pebbles, organic smell. @ 0-3-ft. brown @ 3-4-ft. dark gray @ 4-ft. concrete pipe
	4.0-6.0	SM	Fine grained, SILTY SAND, light gray, moist, moderately dense, trace pebbles.
			TOTAL DEPTH 6.0 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-4	0.0-3.0	SM	**ARTIFICIAL FILL (afu):** Very fine, SILTY SAND, light yellowish brown. @ 1-ft. dry, loose @ 2-3-ft. moist, moderately loose, abundant roots and rootlets.
	3.0-6.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained, SILTY SAND, brownish gray, moist, moderately dense, trace pebbles.
			TOTAL DEPTH 6.0 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-5	0.0-5.0	SM	**STOCK PILE, UNDOCUMENTED ARTIFICIAL FILL (afu):** Fine grained SILTY SAND, brown, dry, dense, some cobbles.
			TOTAL DEPTH 5.0 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-6	0.0-1.5	SM	**<u>TOPSOIL</u>:** Fine grained, SILTY SAND, light brown, moist, moderately dense, trace pebbles, abundant roots and rootlets. @ 0.5-ft. loose, abundant rootles.
	1.5-7.0	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained, SILTY SAND, brown, moist, moderately dense, trace pebbles.
			TOTAL DEPTH 7.0 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-7	0.0-1.5	SM	**<u>TOPSOIL</u>:** Fine grained, SILTY SAND, light brown, moist, moderately dense, trace pebbles, abundant roots and rootlets. @ 0.5-ft. loose, abundant rootles.
	1.5-6.5	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained, SILTY SAND, light brown, trace medium and coarse SAND, trace pebbles, moist, moderately dense, some roots to 3-ft.
	6.5-7.5	SP-SM	Fine grained SAND, some SILT, trace medium and coarse SAND, trace pebbles and cobbles, yellowish brown.
			TOTAL DEPTH 7.5 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-8	0.0-1.5	SM	**<u>TOPSOIL</u>:** Fine grained, SILTY SAND, light brown, moist, moderately dense, trace pebbles, abundant roots and rootlets. @ 0.5-ft. loose, abundant rootlets.
	1.5-6.5	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained, SILTY SAND, light brown, trace medium and coarse SAND, trace pebbles, moist, moderately dense, some roots to 3-ft.
	6.5-7.5	SP-SM	Fine grained SAND, some SILT, trace medium and coarse SAND, trace pebbles and cobbles, yellowish brown.
			TOTAL DEPTH 7.5 FT NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-9	0.0-1.0	SP-SM	**<u>TOPSOIL</u>:** Fine grained SAND, some SILT, some medium grained SAND, brown, moist, loose, abundant roots and rootlets, trace pebbles.
	1.0-6.0	SP-SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained SAND, some SILT, some medium grained SAND, trace cobbles and pebbles, moist, moderately dense.
			TOTAL DEPTH 6.0 FT NO GROUNDWATER ENCOUNTERED CAVING OBSERVED AT 1-5 FT

Test Pit No.	Depth (ft.)	USCS	Description
T-10	0.0-1.0	SM	**TOPSOIL:** Fine grained SILTY SAND, light gray brown, moist, loose, abundant roots and rootlets.
	1.0-2.5	SP	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Medium to coarse SAND, some gravel, trace SILT, gray brown, moist, moderately dense, fining upward, abundant pebbles, cobbles at 2.5-ft.
	2.5-6.0		Reddish brown, moist, trace cobbles, moderately dense.
			TOTAL DEPTH 6.0 FT NO GROUNDWATER ENCOUNTERED CAVING OBSERVED AT 2-6 FT

Test Pit No.	Depth (ft.)	USCS	Description
T-11	0.0-1.0	SM	**TOPSOIL:** Very fine grained, SILTY SAND, brown, moist, loose, abundant roots and rootlets.
	1.0-7.0	SW	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained, SILTY SAND, yellowish brown, moist, moderately dense, massive.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-12	0.0-3.0		**TOPSOIL:** @ 1-ft. Mulch, dark brown. @ 2-3-ft. manure/organics, black and greenish gray.
	3.0-5.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained, SILTY SAND, brown, moist, moderately dense, trace coarse grained SAND.
	5.0-6.0	SP	Coarse SAND, some very coarse SAND fine gravel, trace pebbles and cobbles, trace SILT, yellowish brown, moist, moderately dense.
	6.0-7.0	SM	Fine grained, SILTY SAND, reddish brown, moist, moderately dense, trace cobbles and pebbles.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATR ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-13	0.0-2.0	SM	**TOPSOIL:** Fine grained, SILTY SAND, dark brown, moist, loose to moderately dense, organic rich, abundant roots and rootlets, trace pebbles.
	2.0-7.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained, SILTY SAND, brown, moist, moderately dense, trace pebbles, massive.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-14	0.0-1.0	SM	**<u>TOPSOIL</u>:** Fine grained, SILTY SAND with some organics, brown, moist, moderately loose, trace pebbles, some rootlets.
	1.0-5.5	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained SILTY SAND, brown, moist, moderately dense, trace pebbles, massive.
	5.5-7.5	SP	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Medium to coarse grained SAND, some very coarse, some gravel, trace pebbles and cobbles, yellowish brown, moist, fining upward, cobbles at 7.5-ft.
			TOTAL DEPTH 7.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-15	0.0-1.0	SM	**<u>TOPSOIL</u>:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, some mulch in upper 0.5-ft.
	1.0-8.0	ML	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** SANDY SILT, with very fine grained SAND, moist, low plasticity, medium stiff, trace pebbles, massive.
			TOTAL DEPTH 8.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-16	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, no mulch.
	1.0-7.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained SILTY SAND, brown with some gray mottling, moist, moderately dense, massive, trace pebbles.
	7.0-9.0	SM	Fine grained SILTY SAND, some medium grained, yellowish brown, trace gravel and pebbles.
			TOTAL DEPTH 9.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-17	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, some mulch in upper 0.5-ft.
	1.0-7.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained SILTY SAND, brown with some gray mottling, moist, moderately dense, massive, trace pebbles.
	7.0-8.0	SM	Fine grained SILTY SAND, yellowish brown, trace gravel and pebbles.
			TOTAL DEPTH 8.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-18	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, some mulch in upper 0.5-ft.
	1.0-6.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained SILTY SAND, brown with some gray mottling, moist, moderately dense, massive, trace pebbles.
	6.5-7.0	SM	Fine grained SILTY SAND, some medium grained, yellowish brown, trace gravel and pebbles.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-19	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets.
	1.0-8.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained SILTY SAND, brown with some gray mottling, moist, moderately dense, massive, trace pebbles, and cobbles.
			TOTAL DEPTH 8.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-20	0.0-2.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, some mulch in upper 0.5-ft. @ 1.5-ft. PVC water line.
	2.0-7.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Very fine grained SILTY SAND, brown with some gray mottling, moist, moderately dense, massive, trace pebbles.
			TOTAL DEPTH 7.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-21	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inch of manure at surface, some rootlets.
	1.0-8.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense, sand lenses with fine grained SAND, gravel, and pebbles.
	8.5-10.5	SP	Medium grained SAND, trace SILT, some gravel, some pebbles, trace cobbles, yellowish brown.
			TOTAL DEPTH 10.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-22	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inch of manure at surface, some rootlets.
	1.0-8.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense.
			TOTAL DEPTH 8.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-23	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inch of manure at surface, some rootlets.
	1.0-7.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense, sand lenses with fine grained sand, gravel, and pebbles.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-24	0.0-1.0	SM	**<u>TOPSOIL</u>:** Very fine grained SILTY SAND, brown, moist, moderately loose, trace rootlets, some mulch in upper 0.5-ft.
	1.0-5.0	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Very fine grained SILTY SAND, brown, moist, moderately dense, trace pebbles, massive.
	5.0-9.0	SP	Fine to medium grained SAND, trace SILT, some gravel and cobbles, light brown.
			TOTAL DEPTH 9.0 NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-25	0.0-2.5	SM	**<u>TOPSOIL</u>:** Very fine grained SILTY SAND, trace pebbles, brown, moist. @ 1-ft. loose @ 1-2-ft. moderately loose, trace pebbles, some reddish brown organic material.
	2.5-3.5	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Very fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense.
	3.5-7.0	SP	Fine to medium grained SAND, trace SILT, some coarse SAND, gravel, pebbles and cobbles.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED POTENTIAL CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-26	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inch of manure at surface, some rootlets.
	1.0-8.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace gravel and pebbles, brown, moist, moderately dense, massive.
			TOTAL DEPTH 8.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-27	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, some rootlets, trace cobbles, faint organic smell. @ 4- inch of manure at surface
	1.0-8.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace gravel and pebbles, brown, moist, moderately dense, massive.
			TOTAL DEPTH 8.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-28	0.0-1.5	SM	**TOPSOIL:** Gravel with fine grained SILTY SAND, some medium grained SAND, tan colored, moist, moderately loose. @ 2-inches manure on surface, abundant rootlets in top 0.5-ft.
	1.5-7.0	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense.
			TOTAL DEPTH 7.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

Test Pit No.	Depth (ft.)	USCS	Description
T-29	0.0-1.0	SM	**TOPSOIL:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inches of manure at surface, some rootlets.
	1.0-3.5	SM	**YOUNG ALLUVIAL FAN DEPOSIT (Qyf):** Fine grained SILTY SAND, trace gravel and pebbles, brown, moist, moderately dense, massive.
	3.5-9.0	SP-SM	Fine to medium grained SAND, some SILT, some gravel, coarse SAND, and cobbles, yellowish brown.
			TOTAL DEPTH 9.0 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED CAVING POTENTIAL BELOW 3.5 FT.

Test Pit No.	Depth (ft.)	USCS	Description
T-30	0.0-1.0	SM	**<u>TOPSOIL</u>:** Very fine grained SILTY SAND, brown, moist, moderately loose, 2-inches of manure at surface, some rootlets.
	1.0-8.5	SM	**<u>YOUNG ALLUVIAL FAN DEPOSIT (Qyf)</u>:** Fine grained SILTY SAND, trace pebbles, brown, moist, moderately dense, sand lenses with fine grained sand, gravel, and pebbles.
			TOTAL DEPTH 8.5 FT. NO GROUNDWATER ENCOUNTERED NO CAVING OBSERVED

TABLE B

Date	Test Location	Depth (ft)	Moisture (%)	Wet Density (pcf)	Dry Density (pcf)
3/18/2015	TP-2	-2	15.0	115.4	100.3
3/18/2015	TP-2	-4	5.5	122.7	116.3
3/18/2015	TP-3	-3	18.1	119.6	101.3
3/18/2015	TP-4	-2	5.9	107.3	101.3
3/18/2015	TP-4	-4	5.5	102.6	97.2
3/18/2015	TP-8	-2	12.1	109.2	97.4
3/18/2015	TP-8	-4	7.2	103.1	96.2
3/19/2015	TP-15	-3	16.0	108.2	93.3
3/19/2015	TP-15	-5	12.6	114.8	102.0
3/19/2015	TP-16	-2	9.5	106.2	97.0
3/19/2015	TP-16	-4	10.7	101.2	91.4
3/19/2015	TP-17	-2	11.2	106.1	95.4
3/19/2015	TP-17	-4	11.2	107.6	96.8
3/19/2015	TP-18	-3	12.4	104.7	93.1
3/19/2015	TP-19	-3	8.5	113.9	105.0
3/19/2015	TP-21	-3	8.4	117.5	108.4
3/19/2015	TP-22	-3.5	5.9	116.5	110.0
3/19/2015	TP-23	-3	8.7	114.3	105.2
3/19/2015	TP-24	-3	9.7	112.2	102.3

APPENDIX B-1

Previous Subsurface Investigation

BORING LOG NO.: GK-1

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
					SM	**Surface: Silty Sand (SM), Brown, dry, loose.**	
5.7	106.7	6/7/10	R-1	5	SP	Sand (SP): Light yellowish brown, Slightly moist, medium dense, poorly graded	
1.5	120.0	9/15/15	R-2	10	GP	@10' Sandy Gravel (GP): Light yellowish brown, dry, gravel to 2.5" diameter	
7.6	107.3	5/6/10	R-3	15	SP-SM	@15' Silty Sand (SP-SM): Dark yellowish brown, slightly moist, medium dense poorly graded	
26.2	97.5	5/7/11	R-4	20	SC	@20' Clayey Sand (SC): Olive brown, wet, very stiff.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

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Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- [B] Bulk Sample
- [C] Rock Core
- [R] Ring Sample
- [S] Standard Split Spoon
- [T] Tube Sample

Location: Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: Notes:

BORING LOG NO.: GK-2

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface: Silty Sand; light brown, dry, loose.	
			B				
14.4	111.7	3/5/6	R-1	5	SM	@5' Silty Sand with Clay (SM/SC): Light brown, moist, medium stiff, minor pinhole porosity	
11.1	116.6	6/8/18	R-2	10	SM	@10' Silty Sand (SM): Yellowish brown, moist, dense, mottled	
21.4	104.0	6/10/12	R-3	15	ML	@15' Silt (ML): Mottled yellowish brown, very moist, minor pinhole porosity	
24.5	101.6	9/15/21	R-4	20		@20' Silt (ML): Mottled yellowish brown, very moist, minor pinhole porosity	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

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Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
B Bulk Sample
C Rock Core
R Ring Sample
S Standard Split Spoon
T Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-3

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
					SM	**Surface:** Silty Sand, brown, dry, loose.	
15.4	113.1	3/5/6	R-1	5	CL	Sandy Clay (CL) Brown, moist, medium stiff, minor pinhole porosity & caliche stringers.	
11.1	119.8	6/8/18	R-2	10	SC	@10' Clayey Sand (SC): Dark yellowish brown, moist, dense, mottled, minor pinhole porosity.	
11.9	107.4	6/10/12	R-3	15	ML	@15' Sandy Silt (ML): Dark yellowish brown, moist, dense pinhole porosity.	
12.7	113.0	9/15/21	R-4	20	ML	@20' Sandy Silt (ML): Dark yellowish brown, moist, very stiff pinhole porosity.	
21.3	105.5	6/8/18	R-5	25	CL	@25' Silty Clay (CL): Dark yellowish brown, mottled, very moist, very stiff.	
5.2	124.6	6/10/12	R-6	30	SM/SC	@30' Silty Sand with Clay (SM/SC): Dark yellowish brown, slightly moist, very dense pinhole porosity.	
2.2	126.6	9/15/21	R-7	35	GP	@35' Sandy Gravel (GP): Yellowish brown, dry, very dense, gravels to 1" diameter.	

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Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- [B] Bulk Sample
- [C] Rock Core
- [R] Ring Sample
- [S] Standard Split Spoon
- [T] Tube Sample

Location: ____ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ____ Notes: ____

BORING LOG NO.: GK-3 Continued

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
2.1	130.1	3/5/6	R-8	40	SP	@40' Gravelly Sand (SP): Yellowish brown, dry, very dense, poorly graded, gravels to 1" diameter.	
8.0	119.3	6/8/18	R-9	45	SP	@45' **Tip:** Gravelly Sand (SP): Yellowish brown, moist, very dense, gravels to 1" diameter. **Top:** Silty Sand (SM), fine sand, dark yellowish brown, moist, very dense.	
3.0	121.8	6/10/12	R-10	50	SP/GP	@50' Sandy Gravel/Gravely Sand (SP/GP): Dark yellowish brown, dry, very dense.	

Total Depth = 51'
No Groundwater
Backfilled with cuttings

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location:
Logged by: SST
Date Drilled: 9/14/04
Equipment Used: CME-75
Ring Type: 2.5"
Ground Elevation:
Notes:

BORING LOG NO.: GK-4

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface:	
					SM	@1' Silty Sand (SM): Brown, damp, loose	
5.0	110.3	4/5/8	R-1	5	SM	@5' Silty Sand (SM): Dark yellowish brown, slightly moist, medium dense, massive	
2.4	104.4	6/9/12	R-2	10	SW	@10' Sand (SW): Grayish brown, dry, very dense	
1.9	122.4	11/12/20	R-3	15	SW	@15' Sand (SW): Grayish brown, dry, very dense	
10.0	96.6	10/10/15	R-3	20	ML	@20' Very Fine Sandy Silt (ML) Dark yellowish brown, moist, very stiff	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: Notes:

BORING LOG NO.: GK-5

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface: Top Soil:	
					SM	@1' Silty Sand (SM): Dark brown, damp, loose	
9.3	106.8	4/5/8	R-1	5	SM	@5' Silty Sand (SM): Dark grayish brown, moist, medium dense, massive	
9.5	108.0	6/9/12	R-2	10	SM	@10' Silty Sand (SM): Dark grayish brown, moist, medium dense, massive	
4.3	119.2	11/12/20	R-3	15	SM	@15' Silty Sand (SM): Dark grayish brown, Slightly moist, medium dense, massive with gravel	
16.1	115.8	10/10/15	R-3	20	SM	@20' Silty Sand (SM) Mottled olive brown and dark brownish gray, very moist, very dense	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-6

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
					SM	**Surface: Top Soil** Silty Sand (SM) Brown, dry, loose.	
6.3	107.5	5/5/7	R-1	5	SP	@5' Silty Fine Sand (SP/SM): Brown, moist, medium dense, poorly graded.	
3.1	120.8	7/9/15	R-2	10	SP	@10' Gravely Sand / Sandy Gravel (SP/GP): Yellowish brown, dry, dense.	
12.6	116.6	9/11/17	R-3	15	SC	@15' Clayey Sand (SC): Dark yellowish brown, moist, dense, minor pinhole porosity.	
6.1	116.7	12/13/18	R-4	20	SM	@20' Silty Sand (SM): Dark yellowish brown, slightly moist, dense, minor pinhole porosity.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-7

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
					SM	**Surface:** Silty Sand (SM), light brown, damp, loose.	
7.8	106.2	3/3/6	R-1	5	SM	@5' Silty Sand (SM): Dark brown, slightly moist, loose.	
20.7	107.1	4/4/4	R-2	10	ML	@10' Sandy Silt (ML): Yellowish brown, very moist, medium soft	
6.4	111.9	12/14/17	R-3	15	SW	@15' Gravelly Sand (SW): Dark yellowish brown, slightly moist, medium dense, gravels to 2" diameter	
5.6	128.1	50/43/50	R-4	20	SP	@20' Sand (SP): Light brown, slightly moist, very dense.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-8

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
					SM	**Surface:** Silty Sand (SM), brown, damp, loose.	
3.4	102.3	3/3/6	R-1	5	SP	@5' Sand (SP): Yellowish brown, dry, loose.	
12.4	115.8	4/4/4	R-2	10	SC	@10' Clayey Sand (SC): Dark yellowish brown, moist, loose.	
8.8	117.4	12/14/17	R-3	15	SM	@15' Silty Sand (SM): Dark yellowish brown, moist, medium dense, occasional gravels to 2.5" diameter, some silt.	
3.4	118.0	50/43/50	R-4	20	SP	@20' Sand (SP): Dark yellowish brown, damp moist, very dense, massive.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
B Bulk Sample
C Rock Core
R Ring Sample
S Standard Split Spoon
T Tube Sample

Location: Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: Notes:

BORING LOG NO.: GK-9

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface: Manure	
					SM	@1' Silty Sand (SM): Yellowish brown, moist, loose.	
3.0	113.3	3/3/6	R-1	5	SP	@5' Sand (SP): Yellowish brown, dry, loose.	
3.7	110.6	4/4/4	R-2	10	SP	@10' Sandy (SP): Dark yellowish brown, dry, loose.	
3.7	105.8	12/14/17	R-3	15	SM-SP	@15' Silty Sand with Gravel (SM-SP): Dark yellowish brown, dry, medium dense, occasional gravels to 2.5" diameter.	
28.6	94.3	50/43/50	R-4	20	CL	@20' Sandy Clay (CL): Dark yellowish brown, very moist, very dense, massive.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-10

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface: @1' Silty fine sand, medium brown, moist, loose.	
2.9	121.0	7/6/6	R-1	5	SM	@5' Silty Sand (SM): Yellowish brown, dry, medium dense, occasional gravels to 2" diameter	
10.5	119.6	14/14/21	R-2	10	SM	@10' Silty Gravely Sand (SM): Yellowish brown, moist, very dense, gravels to 1/2" diameter, F_eO patches.	
3.6	131.6	13/15/21	R-3	15	SW	@15' Gravely Sand (SW): Brown, dry, very dense gravels to 2.5" diameter.	
18.5	103.4	6/12/12	R-4	20	ML	@20' **Tip:** Silt (ML): Dark yellowish brown, moist, stiff. **Top:** Silty Sand (SM) Dark yellowish brown, moist, dense.	
7.6	104.6	5/12/27	R-5	25	SM	@25' Silty Fine Sand (SM): Olive brown, slightly moist, very dense.	
19.8	109.3	7/15/24	R-6	30	ML	@30' Fine Sandy Silt (ML): Dark yellowish brown, very moist, very stiff to hard.	
19.0	109.7	8/15/20	R-7	35	ML	@35' Silt (ML): Dark yellowish brown, very moist, very stiff.	

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Project Name: Hillcrest De Boer
Project No.: 1957

Sample Types:
- [B] Bulk Sample
- [C] Rock Core
- [R] Ring Sample
- [S] Standard Split Spoon
- [T] Tube Sample

Location: ______ Logged by: SST
Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"
Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-10 Cont.

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
19.2	111.1	9/17/23	R-8	40	ML	@40' Silt (ML): Dark yellowish brown, very moist, very stiff.	
8.0	119.3	12/16/26	R-9	45	SM	@45' Silty Fine Sand (SM): Dark yellowish brown, slightly moist, very dense.	
3.0	121.8	8/11/14	R-10	50	ML	@50' Sandy Silt (ML): Dark yellowish brown, dry, very stiff.	
						Total Depth = 51' No Groundwater Backfilled with cuttings	

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Project Name: Hillcrest De Boer

Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location:

Logged by: SST

Date Drilled: 9/14/04 Equipment Used: CME-75 Ring Type: 2.5"

Ground Elevation: Notes:

BORING LOG NO.: GK-11

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface:	
					SP	@1' Silty Sand (SP): Dark brown, moist, loose.	
8.1	103.7	4/4/6	R-1	5	SM	@5' Silty Fine Sand (SM): Strong brown, moist, medium dense.	
14.0	117.6	2/5/8	R-2	10	SM-ML	@10' Silty Sand / Sandy Silt (SM/ML): Dark yellowish brown, moist, medium dense, massive.	
5.0	126.5	5/7/11	R-3	15	SM	@15' Gravelly Silty Sand (SM): Dark yellowish brown, slightly moist, dense, gravel to 1" diameter.	
3.6	121.8	19/20/19	R-4	20	SM	@20' **Top:** Gravelly Silty Sand (SM): Dark yellowish brown, dry, dense, gravel to 1" diameter. **Tip:** Sandy Silt (ML) Moist, yellowish brown, very stiff.	
				25		Total Depth = 21' No Groundwater Backfilled with cuttings	
				30			
				35			

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Project Name: Hillcrest De Boer

Project No.: 1957

Sample Types:
- [B] Bulk Sample
- [C] Rock Core
- [R] Ring Sample
- [S] Standard Split Spoon
- [T] Tube Sample

Location: ______ Logged by: SST

Date Drilled: 9/13/04 Equipment Used: CME-75 Ring Type: 2.5"

Ground Elevation: ______ Notes: ______

BORING LOG NO.: GK-12

Moisture (%)	Dry Density (pcf)	Penetration Resistance (Blows/6 inch)	Sample Type	Depth (Feet)	Lithology	Description of Subsurface Materials: Classification, (USCS) color, mixture, consistency, etc.	Elevation (Feet)
						Surface: Grass	
					SM	@1' Silty Sand (SM): Brown, damp, loose, roots.	
			B				
8.5	115.4	3/7/8	R-1	5	SP	@5' Silty Sand (SM): Brown, moist, medium dense.	
2.3	118.0	6/10/17	R-2	10	SW	@10' Sand (SW): Brown, to light brown, dry, medium dense.	
2.7	121.2	6/9/21	R-3	15	SM	@15' **Top:** Silty Sand (SM): Olive brown, dry, dense. **Tip:** Gravelly Sand (SW): Light yellowish brown, dry, dense.	
19.6	110.4	6/10/19	R-4	20	ML	@20' Silt (ML) Dark yellowish brown, very moist, stiff.	
						Total Depth = 21' No Groundwater Backfilled with cuttings	
				25			
				30			
				35			

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Project Name: Hillcrest De Boer

Project No.: 1957

Sample Types:
- B Bulk Sample
- C Rock Core
- R Ring Sample
- S Standard Split Spoon
- T Tube Sample

Location: ______ Logged by: SST

Date Drilled: 9/13/04 Equipment Used: CME-75 Ring Type: 2.5"

Ground Elevation: ______ Notes: ______

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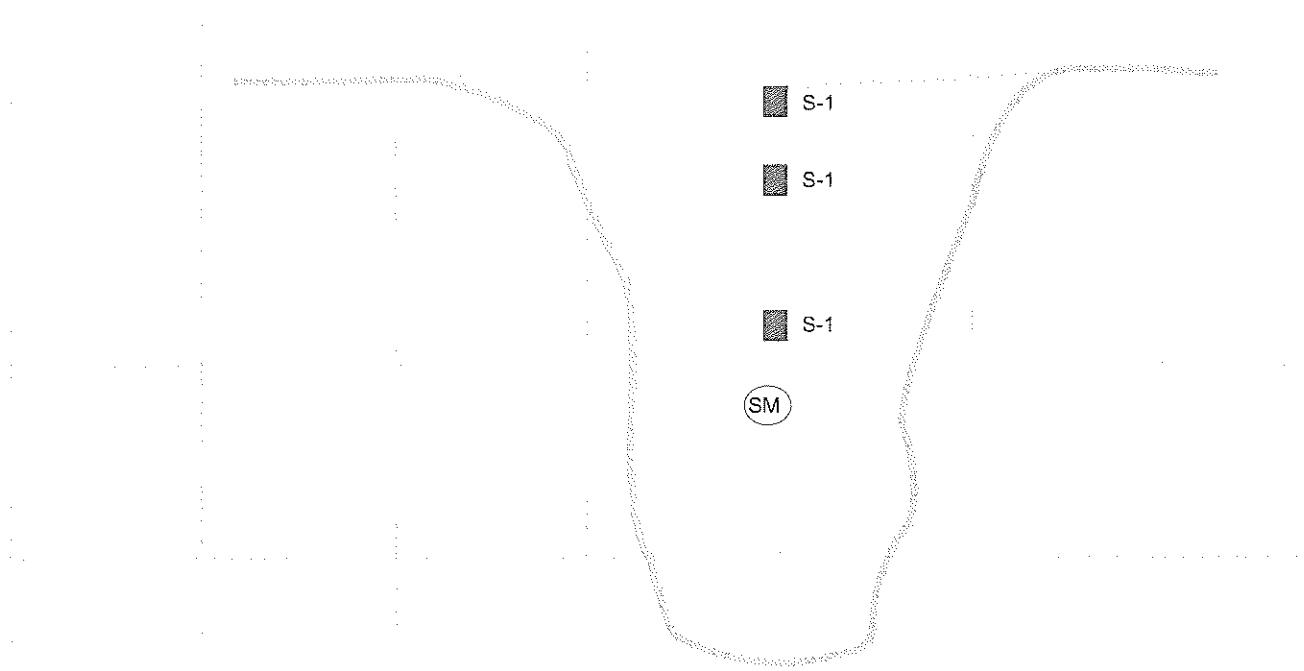
Project Name: Hill Crest Homes Location: De Boer

Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0" - 8" Silty Sand (SM); Light yellowish brown, dry, very loose, Organics. 8" - 14" Silty Sand (SM); Medium red brown, moist, loose, organics 14" - 66" Silty Sand (SM); Medium red brown, moist, dense, roots. 66" - 72" Silty Sand (SM); Medium Yellowish brown, moist, moderately dense.		

Graphic Representation: Surface Slope: Trend:

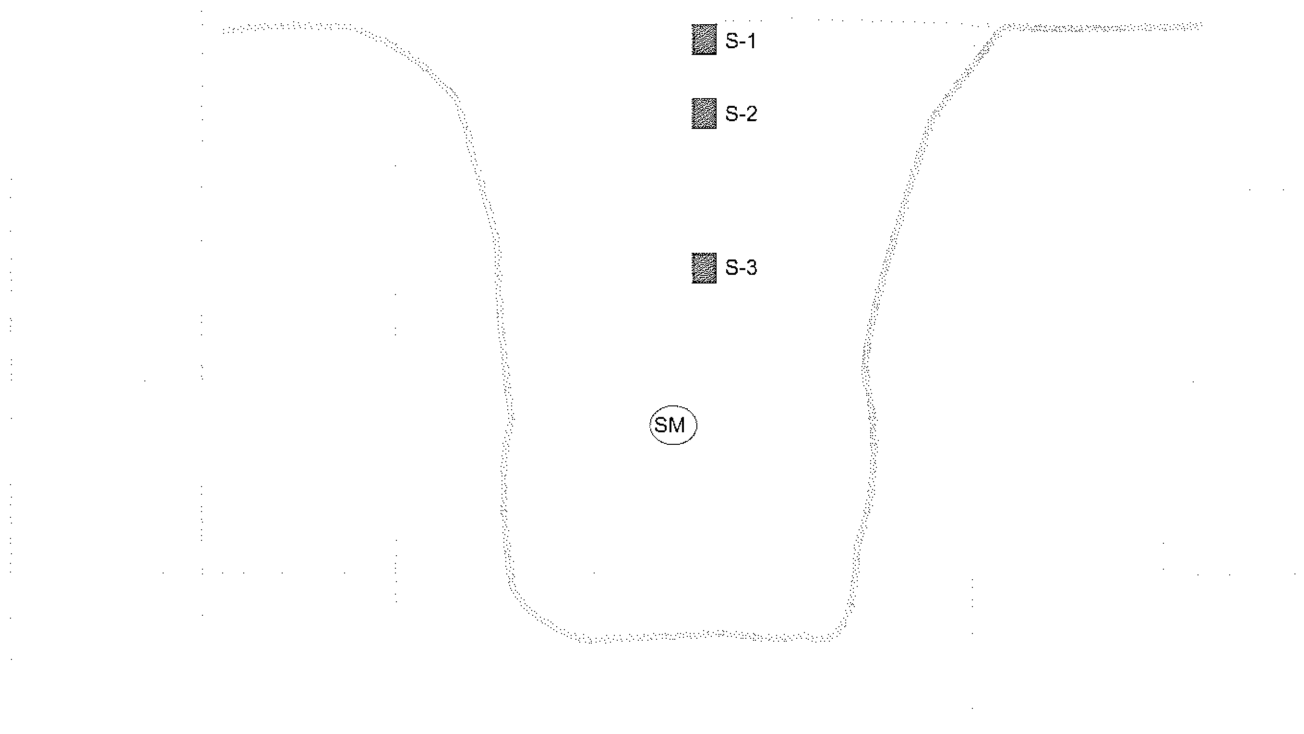


GeoKinetics
Geotechnical & Environmental Engineers

Project Name: Hill Crest Homes | Location: De Boer
Project No.: 1957 | Equipment: Backhoe | Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0" - 9" Silty Sand (SM); Light yellowish brown, dry, very loose, Organics. 9" - 67" Silty Sand (SM); Light to medium, yellowish brown, moist, dense, occassional inclusions of organic pockets from 9" to 21". 67" - 81" Silty Sand (SM); Medium olive gray, moist, moderately dense.		

Graphic Representation: Surface Slope: Trend:



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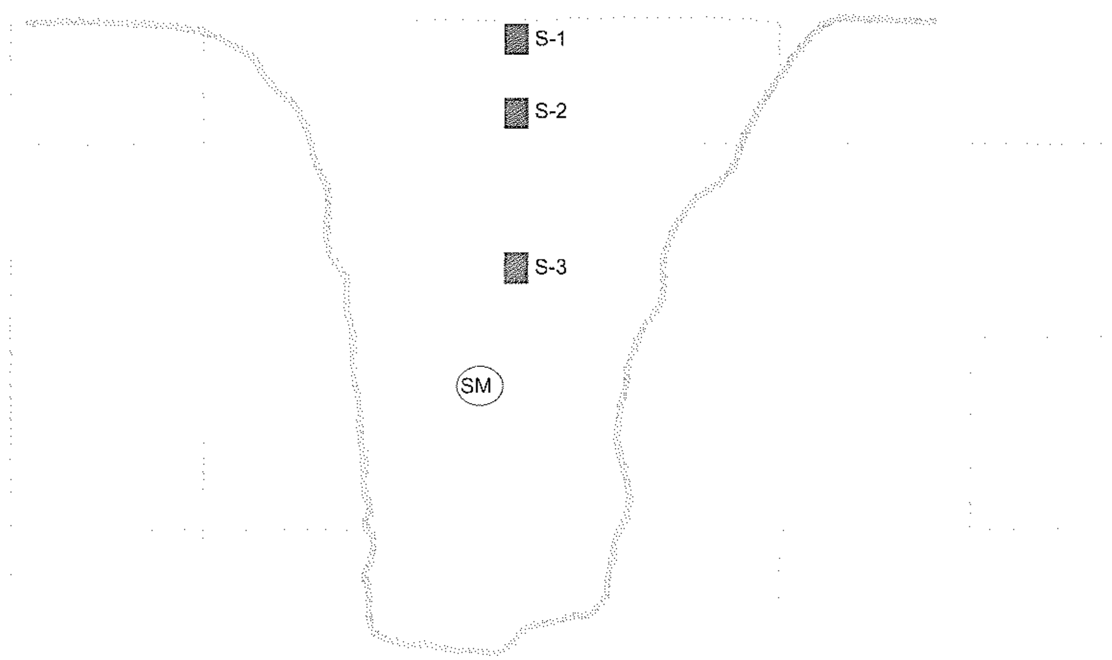
Environmental Engineers

Project Name: Hill Crest Homes   Location: De Boer
Project No.: 1957   Equipment: Backhoe   Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0" - 0.5" Organics (Manure); Dry, loose 0.5" - 8" Silty Sand (SM); Light yellowish brown, dry, very loose, organics 8" - 84" Silty Sand (SM); Medium yellowish brown, moist, moderately dense to dense.		

Graphic Representation: Surface Slope: Trend:



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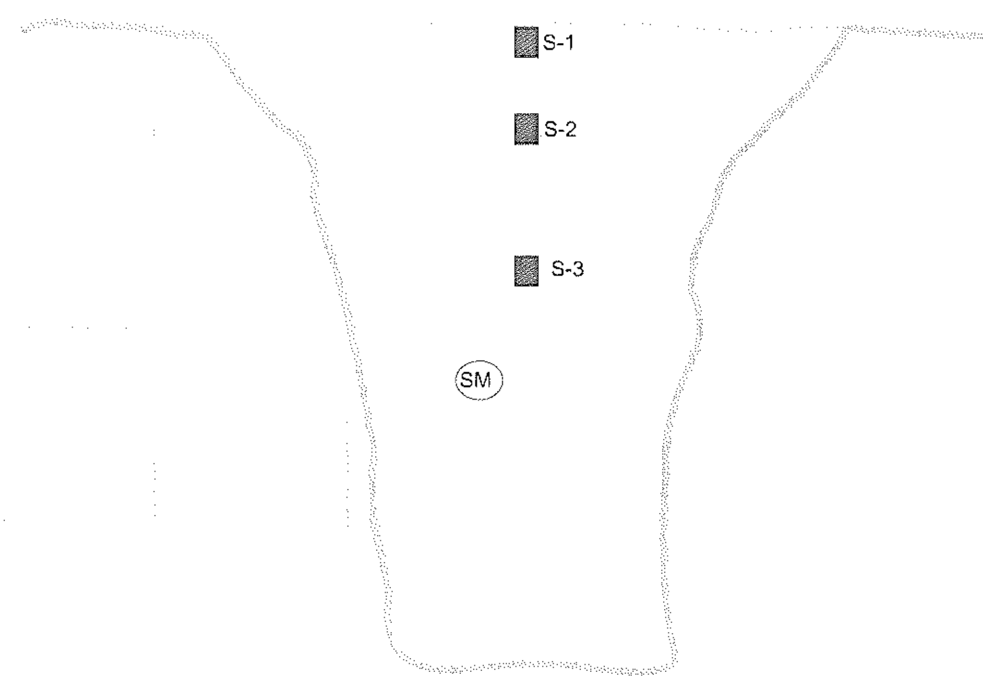
Geotechnical & Environmental Engineers

Project Name: Hill Crest Homes Location: De Boer

Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 0.5" Organics (Manure); Dry, loose 0.5" - 9" Silty Sand (SM); Light yellowish brown, dry, very loose, organics 9" - 13" Silty Sand (SM); Medium yellowish brown, moist, dense. 13" - 30" Silty Sand (SM); Medium olive brown, moist, dense, organics. 30" - 60" Same but dark olive brown. 60" - 84" Silty Sand (SM); Medium to dark olive gray, moist to very moist, dense.		

Graphic Representation: Surface Slope: Trend:



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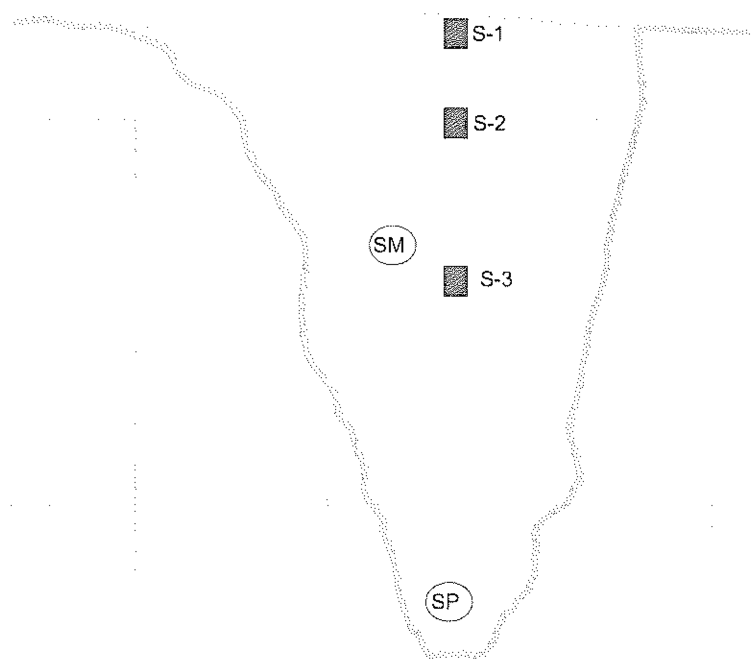
Geotechnical & Environmental Engineers

Project Name: Hill Crest Homes Location: De Boer

Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 7" Silty Sand (SM); Light Yellow brown, dry, very loose, organics		
	7" - 32" Silty Sand (SM); Medium yellowish brown, moist, moderately dense to dense.		
	32" - 72" Silty Sand (SM); Medium yellowish brown, moist to very moist, low to moderately dense.		
	72" - 86" Silty Sand with Gravel (SP); Medium yellowish brown, very moist, dense, fine to coarse grained, rounded gravel to 3" diameter.olive brown, moist, dense, organics.		

Graphic Representation: Surface Slope: Trend:



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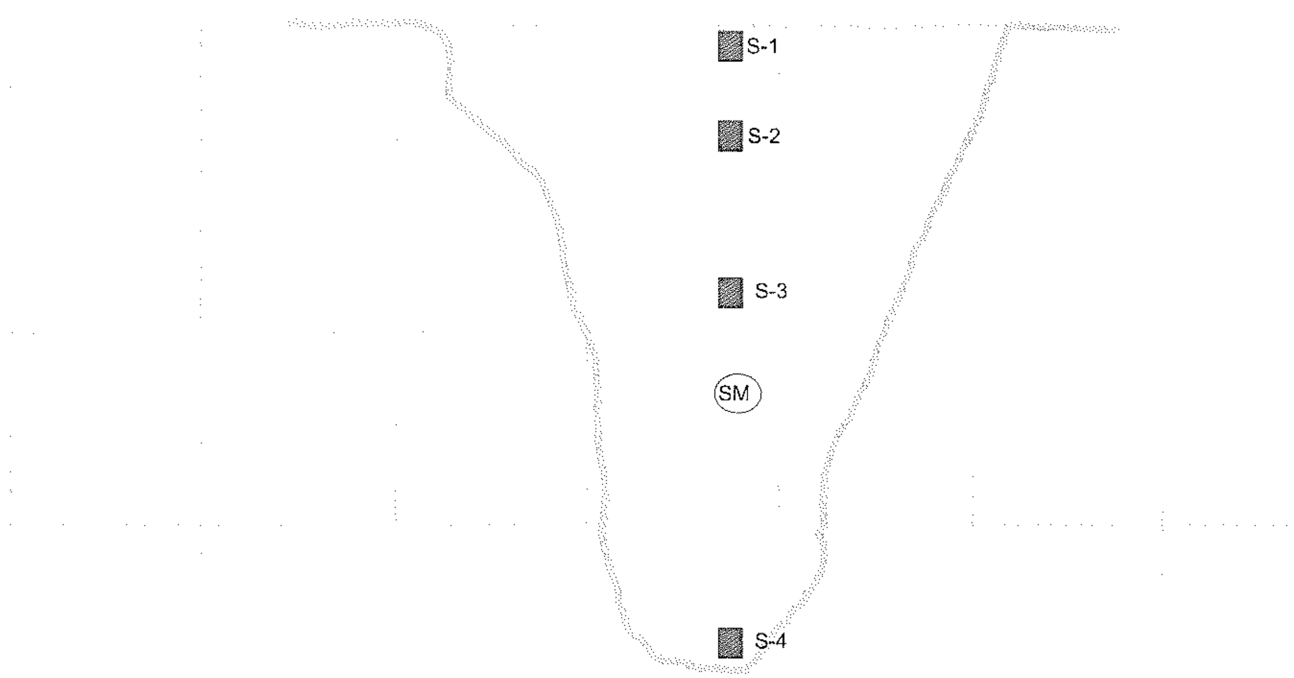
Geotechnical & Environmental Engineers

Project Name: Hill Crest Homes   Location: De Boer

Project No.: 1957   Equipment: Backhoe   Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 6" Silty Sand (SM); Light to medium yellowish brown, dry, very loose. 6" - 14" Silty Sand (SM); Medium to dark red brown, moist, dense, organics. 14" - 39" Silty Sand (SM); Dark brown, moist, dense, organics. 39" - 84" Silty Sand (SM); Medium olive brown/gray, moist, loose to moderately dense.		

Graphic Representation: Surface Slope: Trend:



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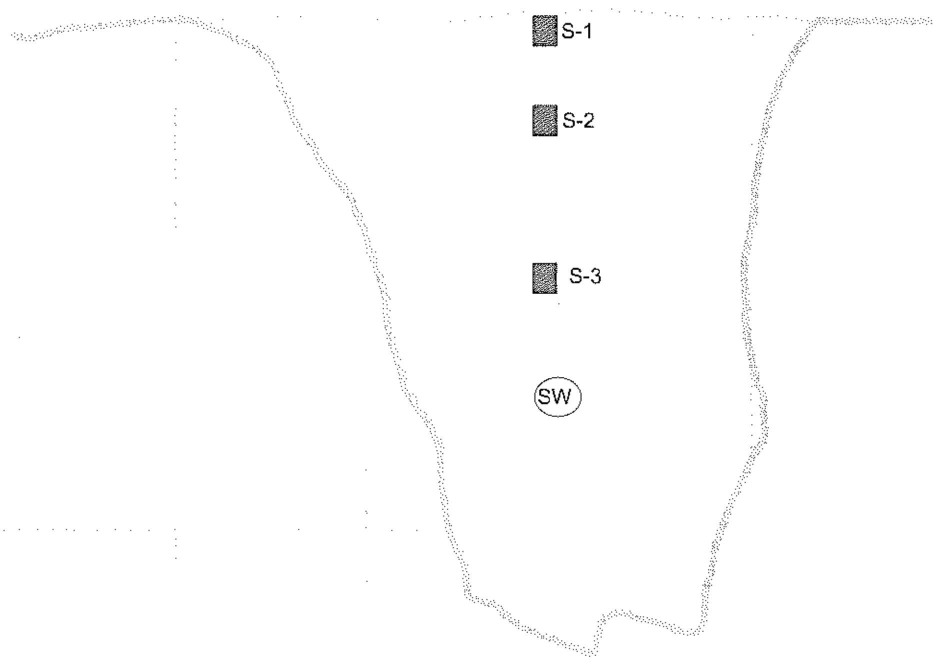
Project Name: Hill Crest Homes Location: De Boer
Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 7" Silty Sand (SM); Medium yellowish brown, dry, very loose. 7" - 31" Silty Sand (SM); Dark brown, moist, dense, organic. 31" - 38" Silty Sand (SM); Dark olive gray, moist, moderately dense, organics. 38" - 84" Silty Sand (SM); Medium yellowish brown, moist, dense.		

Graphic Representation: Surface Slope: Trend:



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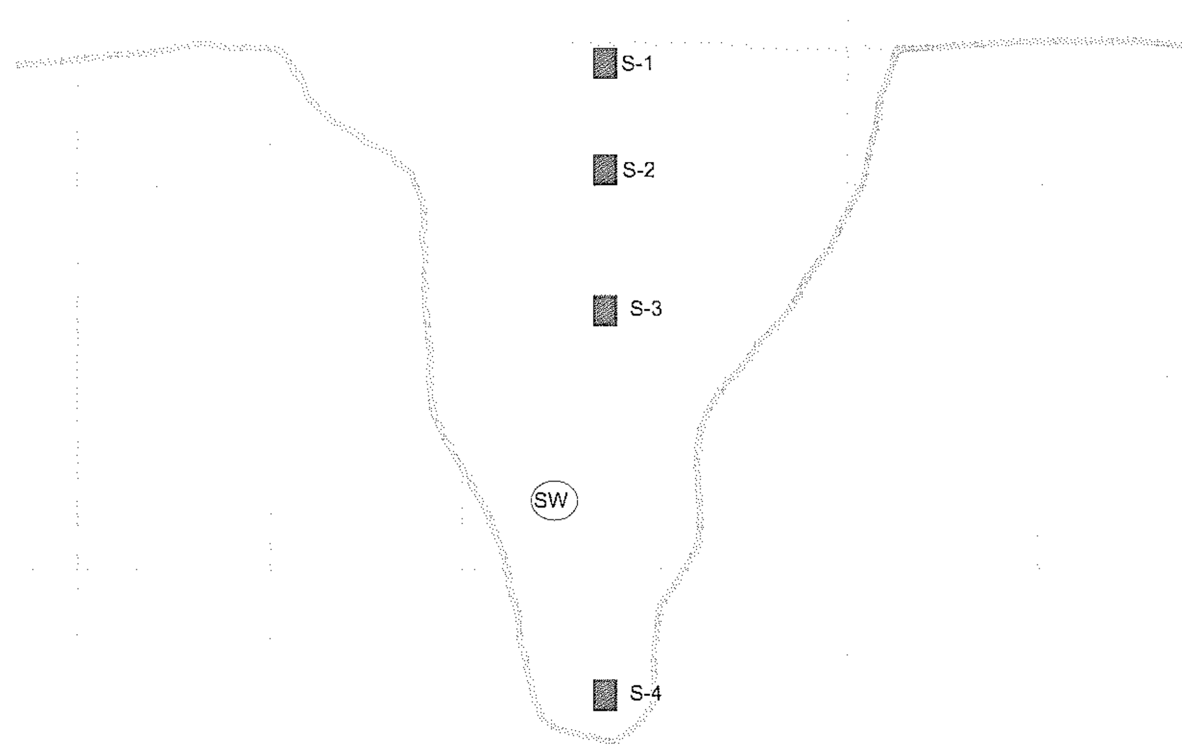
Geotechnical & Environmental Engineers

Project Name: Hill Crest Homes Location: De Boer

Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 12" Silty Sand (SM); Medium to dark olive brown, moist, loose, organic, rounded gravel. 12" - 51" Silty Sand (SM); Medium yellowish brown, moist, dense, occasional gravel (small to large drain, subrounded to rounded), mottled with a dark brown organic silty sand (SM) 51" - 84" Silty Sand (SM); Medium olive grey, very moist, moderately dense		

Graphic Representation: Surface Slope: Trend:



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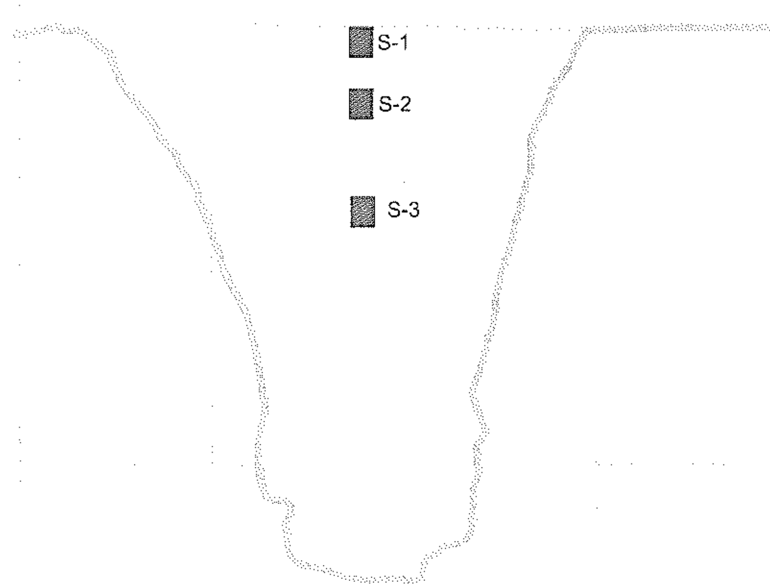
Project Name: Hill Crest Homes Location: De Boer

Project No.: 1957 Equipment: Backhoe Elevation:

Geologic Attitudes	Description	Geologic Unit	U.
	0.0" - 8" Silty Sand (SM); Medium to brown, moist, loose, organics 8" -34" Silty Sand (SM); Dark brown, moist, dense, organics, trash (pvc pipe, asphalt, etc.) 34" - 84" Silty Sand (SM); Medium red brown, moist, dense. 84" -108" Silty Sand (SM); Olive brown, moist, moderately dense.		

Graphic Representation: Surface Slope: Trend:



APPENDIX C

Laboratory Testing

LABORATORY TESTING

The following laboratory tests were performed on representative samples in accordance with the applicable latest standards or methods from the ASTM, California Building Code (CBC) and California Department of Transportation.

Classification

Soils were classified with respect to the Unified Soil Classification System (USCS) in accordance with ASTM D-2487 and D-2488.

Particle Size Analysis

Modified hydrometer testing was conducted to aid in classification of the soils. The results of the particle size analysis are presented in Table C-1.

Maximum Density/Optimum Moisture

The maximum dry density and optimum moisture content of three representative bulk samples were evaluated in accordance with ASTM D-1557. The results are summarized in Table C-1.

TABLE C
SUMMARY OF LABORATORY TEST DATA
P.N. 1-0152

Boring/Pit No.	Depth	Soil Description	Group Symbol - Unified Soil Classification System	Maximum Dry Density: Maximum Density (pcf)	Maximum Dry Density: Optimum Moisture (%)	Direct Shear	Grain Size Analysis: Gravel (% + No. 4 Screen)	Grain Size Analysis: % Sand	Grain Size Analysis: %Silt (0.074 to 0.005mm)	Grain Size Analysis: % Clay (-0.005 mm)	Expansion Index	Sulfate Content (%)	Consolidation	Other Tests Remarks
TP-2	4	Silty Sand (Qyf)	SM	127	8.1		10	76	10	4				
TP-15	5	Silty Sand (Qyf)	SM	128.1	9.2		2	70	19	9				
TP-21	3	Silty Sand (Qyf)	SM	126.3	9		0	62	33	5				
TP-24	3	Sandy Silt (Qyf)	SM	117.9	10		1	73	23	3				

Alta California Geotechnical, Inc.

APPENDIX C-1

Previous Laboratory Testing

Table 1 - Summary of Laboratory Test Results - Hillcrest - DeBoer

Boring No.	Sample Depth (ft)	USCS[1] Soil Type	Soil Description	Field Dry Density (pcf)	Field Moisture Content (%)	Degree of Saturation (%)	Compaction[2] Max. Dry Density (pcf)	Compaction[2] Opt. Moisture Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Expansion Index	R Value	Corrosivity pH	Corrosivity Min. Resistivity (Ohm-cm)	Corrosivity Sulfate Conc. (ppm)	Corrosivity Chloride Conc. (ppm)	Swell / Collapse on Undisturbed Samples	Direct Shear Peak Cohesion (psf)	Direct Shear Peak Phi (deg)	Direct Shear Ultimate Cohesion (psf)	Direct Shear Ultimate Phi (deg)	Grain Size (%)
GK-1	5.0	SP-SM	Brown Poorly Graded SAND with Silt	106.7	5.7	27.0											0.2% collapse @ .5 ksf load					
	10.0	GP	Grayish Brown Silty Sandy GRAVEL	120.0	1.5	10.0																
	15.0	SP-SM	Light Brown Poorly Graded SAND with Silt	107.3	7.6	36.0																11.5% fines
	20.0	SC	Brown Clayey SAND	97.5	26.2	97.0																
GK-2	2.5	SM	Dark Brown Silty (fine) SAND (Large Bag)				120.0	10.5										301.0	26.9	160.0	25.7	
	5.0	SM/SC	Light Brown Silty SAND with Clay	111.7	14.4	77.0																
	10.0	SM	Light Brown Silty SAND	116.6	11.1	67.0																
	15.0	CL	Brown Sandy CLAY	104.0	21.4	93.0											0.1% collapse @ 2 ksf load					77.4% fines
	20.0	CL	Brown Sandy CLAY	101.6	24.5	100.0											0.1% collapse @ 2.5 ksf load					76.6% fines
GK-3	5.0	CL	Dark Brown Sandy CLAY	113.1	15.4	85.0			42	21	52		6.8	730.0	132.0	69.0	0.1% collapse @ .5 ksf load					
	10.0	SC	Dark Brown Clayey SAND	119.8	11.1	73.0												331	28.4	210	25.1	
	15.0	ML	Brown Sandy SILT	107.4	11.9	56.0											0.1% swell @ 2 ksf load					
	20.0	ML	Brown Sandy SILT	113.0	12.7	70.0																50.7% fines
	25.0	ML	Brown Sandy SILT	105.5	21.3	96.0											0.1% collapse @ 2 ksf load					
	30.0	SM/SC	Dark Brown Silty SAND with Clay	124.6	5.2	40.0																53,.2% fines
	35.0	GP	Brown Sandy GRAVEL	126.6	2.2	18.0																
	40.0	SP	Brown Poorly Graded SAND with Gravel	130.1	2.1	19.0																
	45.0	SP-SM	Brown Poorly Graded SAND with Silty and Gravel	119.3	8.0	52.0																
	50.0	GP	Brown Sandy GRAVEL	121.8	3.0	21.0																
GK-4	5.0	SP-SM	Brown Poorly Graded SAND with Silt	110.3	5.0	26.0																
	10.0	SP	Brown Poorly Graded SAND	104.4	2.4	10.0											0.1% collapse @ 1 ksf load					2.1% fines
	15.0	SP-SM	Brown Poorly Graded SAND with Silt	122.4	1.9	13.0																
	20.0	SM	Brown Silty (fine) SAND	96.6	10.0	36.0																
GK-5	5.0	SP-SM	Dark Gray Poorly Graded SAND with Silt	106.8	9.3	43.0						62.0	6.8	730	132	69		197.0	31.3	85.0	29.5	11.9% fines
	10.0	SM	Dark Gray Silty SAND	108.0	9.5	46.0																
	15.0	SP	Grayish Brown Poorly Graded SAND with Gravel	119.2	4.3	28.0																
	20.0	SC	Dark Brown Clayey SAND	115.8	16.1	95.0																
GK-6	5.0	SM	Brown Silty SAND	107.5	6.3	30.0	-	-	-	-	-	-	-	-	-	-	0.2% collapse @ .5 ksf load					14.3% fines
	10.0	SP/GP	Brown Sandy GRAVEL	120.8	3.1	21.0	-	-	-	-	-	-	-	-	-	-						
	15.0	SC	Brown Clayey SAND	116.6	12.6	77.0	-	-	-	-	-	-	-	-	-	-						
	20.0	SM	Brown Silty SAND with Gravel	116.7	6.1	37.0	-	-	-	-	-	-	-	-	-	-						

Table 1 - Summary of Laboratory Test Results - Hillcrest - DeBoer

Boring No.	Sample Depth (ft)	USCS[1] Soil Type	Soil Description	Field Dry Density (pcf)	Field Moisture Content (%)	Degree of Saturation (%)	Compaction[2] Max. Dry Density (pcf)	Compaction[2] Opt. Moisture Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Expansion Index	R Value	Corrosivity pH	Corrosivity Min. Resistivity (Ohm-cm)	Corrosivity Sulfate Conc. (ppm)	Corrosivity Chloride Conc. (ppm)	Swell / Collapse on Undisturbed Samples	Direct Shear Peak Cohesion (psf)	Direct Shear Peak Phi (deg)	Direct Shear Ultimate Cohesion (psf)	Direct Shear Ultimate Phi (deg)	Grain Size (%)
GK-7	5.0	SM	Dark Brown Silty SAND	106.2	7.8	36.0											0.2% collapse @ .5 ksf load					55.6% fines
	10.0	ML	Dark Brown Sandy Silt	107.1	20.7	97.0																
	15.0	SP-SM	Dark Brown Poorly Graded SAND with Silt and Gravel	111.9	6.4	34.0																
	20.0	SP	Light Brown Poorly Graded SAND with Gravel	128.1	5.6	48.0																
GK-8	5.0	SP	Brown Poorly Graded SAND	102.3	3.4	14.0																3.8% fines
	10.0	SC	Brown Clayey SAND	115.6	12.4	74.0												857	23.5	581	22.4	
	15.0	SM	Light Brown Silty SAND with Gravel	117.4	8.8	55.0																48.5% fines
	20.0	SP-SM	Light Brown Poorly Graded SAND with Silt and Gravel	118.0	3.4	22.0																
GK-9	5.0	SP	Light Brown Poorly Graded SAND with Gravel	113.3	3.0	16.0																
	10.0	SP	Light Brown Poorly Graded SAND with Gravel	110.6	3.7	19.0					35.0											
	15.0	SP-SM	Light Brown Poorly Graded SAND with Silt and Gravel	105.8	3.7	17.0																
	20.0	CL	Light Brown Sandy CLAY	94.3	28.6	98.0																
GK-10	5.0	SM	Light Brown Silty SAND with Gravel	121.0	2.9	20.0											0.2% collapse @ 1 ksf load					14.9% fines
	10.0	SC	Light Brown Clayey SAND	119.6	10.5	69.0																
	15.0	GP	Light Brown Sandy GRAVEL	131.6	3.6	35.0																4.9% fines
	20.0	SM	Light Brown Silty (fine) SAND	103.4	18.5	49.0																
	25.0	SM	Light Brown Silty (fine) SAND	104.6	7.6	34.0																
	30.0	SC	Light Brown Clayey SAND	109.3	19.8	99.0											0.2% collapse @ 4 ksf load					46.5% fines
	35.0	CL	Light Brown Silty CLAY	109.7	19.0	94.0																
	40.0	CL	Light Brown Sandy CLAY	111.1	19.2	99.0																
	45.0	CL	Light Brown Sandy CLAY	115.9	12.0	71.0																
	50.0	CL	Light Brown Silty CLAY	111.2	17.9	94.0																
GK-11	5.0	SM	Dark Brown Silty (fine) SAND	103.7	8.1	35.0																
	10.0	SM	Dark Brown Clayey SAND	117.6	14.0	87.0																
	15.0	SP	Brown Silty SAND	126.5	5.0	41.0											0.2% collapse @ 2 ksf load					18.4% fines
	20.0	SC	Light Brown Poorly Graded SAND with Gravel	121.8	3.6	25.0																
GK-12	5.0	SP-SM	Dark Brown Poorly Graded SAND with Silt and Gravel	115.4	8.5	50.0																
	10.0	SP/GP	Light Brown Poorly Graded SAND with Gravel	118.0	2.3	14.0																
	15.0	SC	Grayish Brown Poorly Graded SAND with Silt	121.2	2.7	19.0																11.8% fines
	20.0	SM	Light Brown Sandy CLAY	110.4	19.6	100.0																

Project Name : Deboer

Summary of Expansion Index Tests

Location	Depth/Elev	Sample Description	EI
GK-3	5.0 Ft.	Dark Brown Sandy CLAY (CL)	52
GK-3	10.0 Ft.	Dark Brown Clayey SAND (SC)	38
GK-9	10.0 Ft.	Dark Brown Clayey SAND (SC)	35

Job No. 1957 Date 11/19/04

Project · Deboer -

)

Source of Material GK-2 @ 2.5'

Description of Material Dark Brown Silty (fine) SAND (SM) Large bag

Test Method (ASTM) D 1557-93-A

TEST RESULTS

Maximum Dry Density 120.0 PCF

Optimum Water Content 10.5 %

ATTERBERG LIMITS

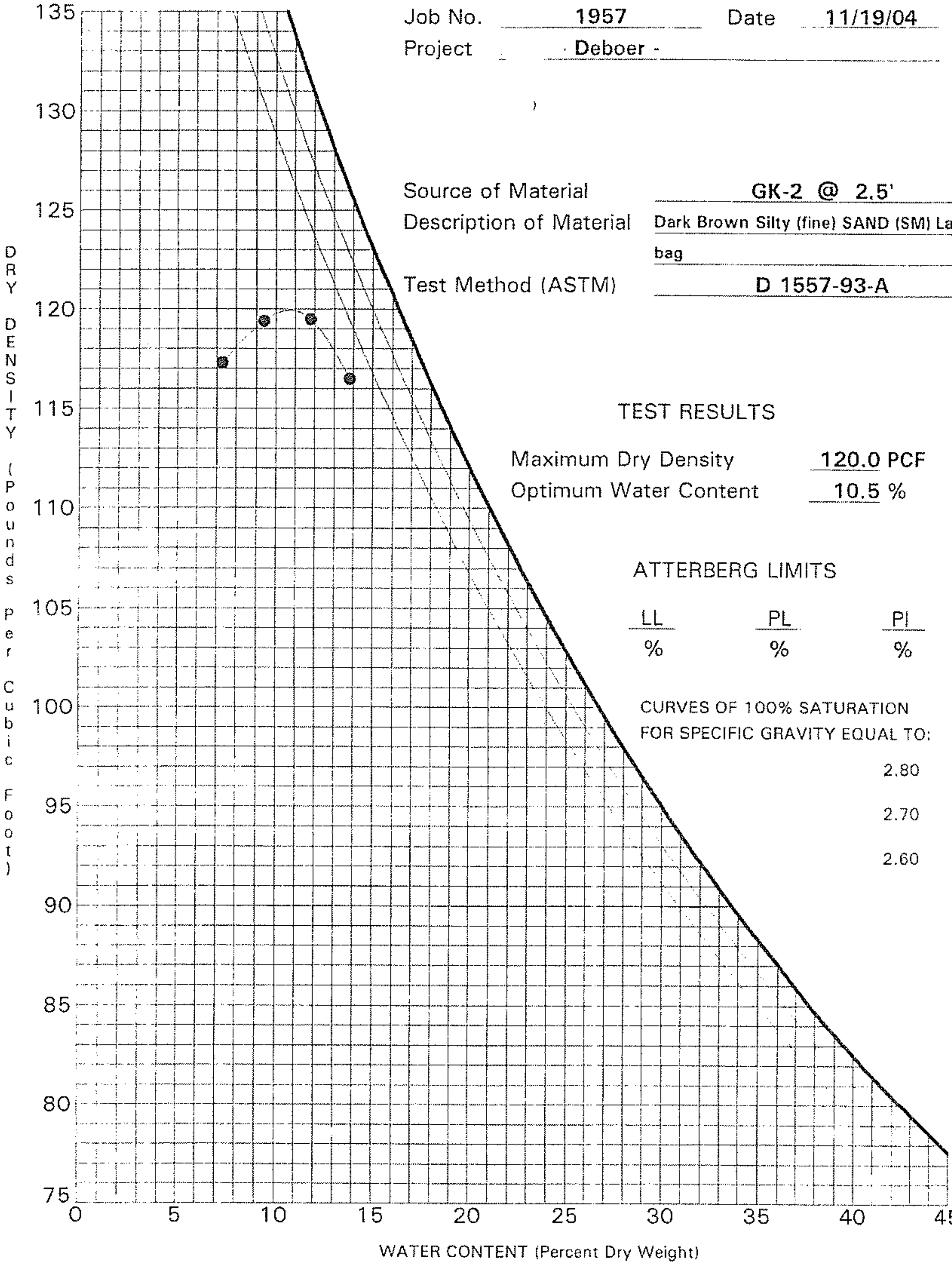
LL	PL	PI
%	%	%

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

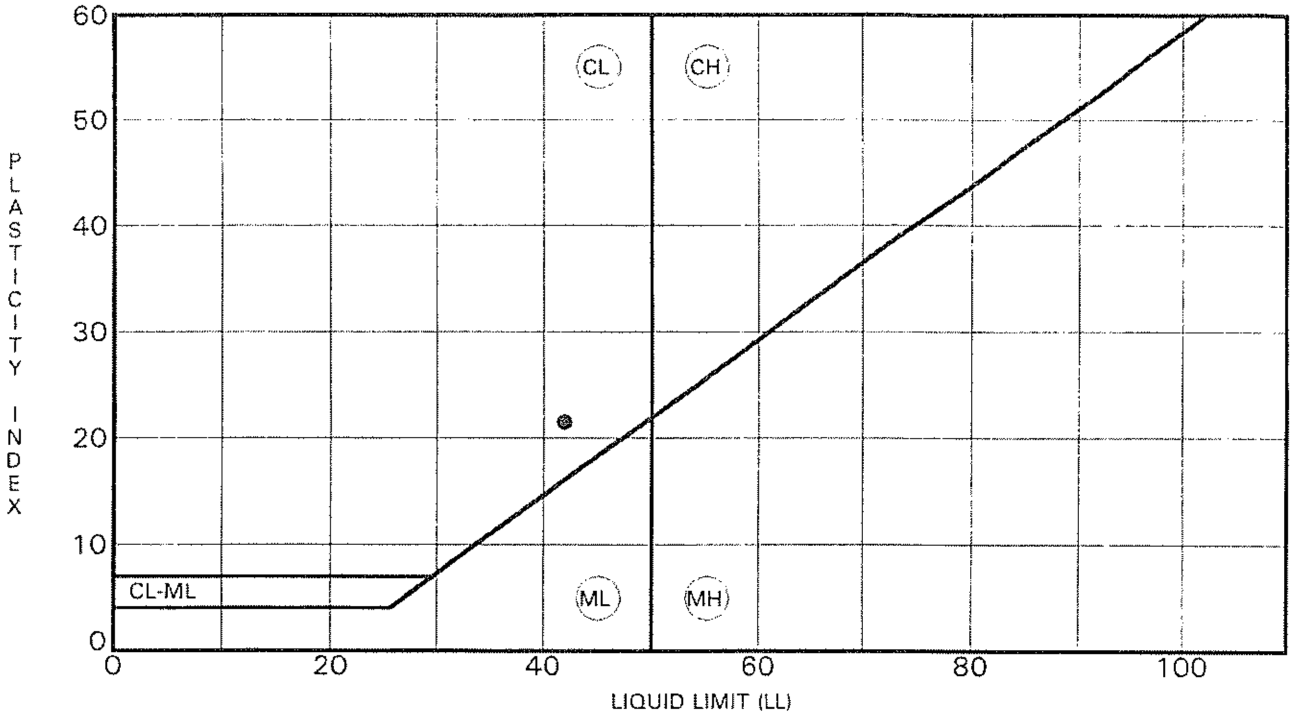
2.80

2.70

2.60



MOISTURE-DENSITY RELATIONSHIP



	Specimen Identification		LL	PL	PI	Fines	Classification
●	GK-3	5.0	42	21	22		Dark Brown Sandy CLAY (CL)

PROJECT Deboer

JOB NO. 1957

DATE 11/19/04

ATTERBERG LIMITS' RESULTS

IRVINE, CA

Project: Deboer Job Number: 1957 Sheet 1 of 1

Tested by: Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-1 5.0	Brown Poorly Graded SAND with Silt (SP-SM) 11.5	112.7	106.7	5.7		26.5	0.58	
GK-1 10.0	Grayish Brown Sandy GRAVEL (GP)	121.8	120.0	1.5		9.9	0.40	
GK-1 15.0	Light Brown Poorly Graded SAND with Silt (SP-SM)	115.5	107.3	7.6		36.0	0.57	
GK-1 20.0	Brown Clayey SAND (SC)	123.0	97.5	26.2		97.1	0.73	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: **Deboer** Job Number: **1957** Sheet 1 of 1

Tested by: Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-2 2.5	Dark Brown Silty (fine) SAND (SM) Large bag							
GK-2 5.0	Light Brown Silty SAND with Clay (SM/SC)	127.8	111.7	14.4		76.6	0.51	
GK-2 10.0	Light Brown Silty SAND (SM)	129.5	116.6	11.1		67.1	0.45	
GK-2 15.0	Brown Sandy CLAY (CL) 77.4	126.2	104.0	21.4		92.9	0.62	
GK-2 20.0	Brown Sandy CLAY (CL) 76.6	126.4	101.6	24.5		100.1	0.66	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: ______ Project Description: ______

Location: ______

Borehole Depth Elev.	Specimen Description (LL, PL, PI, Fines)	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data: % Saturation	Void Ratio	Porosity
GK-3 5.0	Dark Brown Sandy CLAY (CL)	130.5	113.1	15.4		84.6	0.49	
GK-3 10.0	Dark Brown Clayey SAND (SC)	133.1	119.8	11.1		73.6	0.41	
GK-3 15.0	Brown Sandy SILT (ML)	120.2	107.4	11.9		56.2	0.57	
GK-3 20.0	Brown Sandy SILT (ML) Fines 50.7	127.4	113.0	12.7		69.9	0.49	
GK-3 25.0	Brown Sandy SILT (ML) Fines 53.2	127.9	105.5	21.3		96.0	0.60	
GK-3 30.0	Dark Brown Silty SAND with Clay (Sm/SC)	131.0	124.6	5.2		39.5	0.35	
GK-3 35.0	Brown Sandy GRAVEL (GP)	129.3	126.6	2.2		17.6	0.33	
GK-3 40.0	Brown Poorly Graded SAND with Gravel (SP)	132.8	130.1	2.1		18.7	0.30	
GK-3 45.0	Brown Poorly Graded SAND with Silt and Gravel (SP-SM)	128.8	119.3	8.0		52.1	0.41	
GK-3 50.0	Brown Sandy GRAVEL (GP)	125.5	121.8	3.0		21.0	0.38	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: ______ Project Description: ______

Location: ______

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data		
						% Saturation	Void Ratio	Porosity
GK-4 5.0	Brown Poorly Graded SAND with Silt (SP-SM)	115.8	110.3	5.0		25.5	0.53	
GK-4 10.0	Brown Poorly Graded SAND (SP) 2.1	106.8	104.4	2.4		10.3	0.61	
GK-4 15.0	Brown Poorly Graded SAND with Silt (SP-SM)	124.6	122.4	1.9		13.2	0.38	
GK-4 20.0	Brown Silty (fine) SAND (SM)	106.3	96.6	10.0		36.2	0.74	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: **Deboer** Job Number: **1957** Sheet 1 of 1

Tested by: Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-5 5.0	Dark Gray Poorly Graded SAND with Silt (SP-SM) 11.9	116.6	106.8	9.3		43.1	0.58	
GK-5 10.0	Dark Gray Silty SAND (SM)	118.3	108.0	9.5		45.8	0.56	
GK-5 15.0	Grayish Brown Poorly Graded SAND with Gravel (SP)	124.3	119.2	4.3		28.0	0.41	
GK-5 20.0	Dark Brown Clayey SAND (SC)	134.4	115.8	16.1		95.3	0.46	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: | Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-6 5.0	Brown Silty SAND (SM) 14.3	114.3	107.5	6.3		30.0	0.57	
GK-6 10.0	Brown Sandy GRAVEL (SP/GP)	124.5	120.8	3.1		20.9	0.40	
GK-6 15.0	Brown Clayey SAND (SC)	131.3	116.6	12.6		76.5	0.45	
GK-6 20.0	Brown Silty SAND with Gravel (SM)	123.9	116.7	6.1		37.1	0.44	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: | Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data		
						% Saturation	Void Ratio	Porosity
GK-7 5.0	Dark Brown Silty SAND (SM)	114.4	106.2	7.8		35.7	0.59	
GK-7 10.0	Dark Brown Sandy SILT (ML) 55.6	129.2	107.1	20.7		97.4	0.57	
GK-7 15.0	Dark Brown Poorly Graded SAND with Silt and Gravel (SP-SM)	119.1	111.9	6.4		34.3	0.51	
GK-7 20.0	Light Brown Poorly Graded SAND with Gravel (SP)	135.3	128.1	5.6		47.6	0.32	

Summary of Material Properties

GeoKinetics

Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by:

Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-8 5.0	Brown Poorly Graded SAND (SP) 3.8	105.7	102.3	3.4		14.0	0.65	
GK-8 10.0	Brown Clayey SAND (SC) 48.5	130.2	115.8	12.4		73.7	0.46	
GK-8 15.0	Light Brown Silty SAND with Gravel (SM)	127.8	117.4	8.8		54.6	0.44	
GK-8 20.0	Light Brown Poorly Graded SAND with Silt and Gravel (SP-SM)	122.0	118.0	3.4		21.6	0.43	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: ______________ Project Description: ______________

Location: ______________

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data		
						% Saturation	Void Ratio	Porosity
GK-9 5.0	Light Brown Poorly Graded SAND with Gravel (SP)	116.7	113.3	3.0		16.4	0.49	
GK-9 10.0	Light Brown Poolry Graded SAND with Gravel (SP)	114.7	110.6	3.7		18.9	0.52	
GK-9 15.0	Light Brown Poorly Graded SAND with Silt and Gravel (SP-SM)	109.7	105.8	3.7		16.7	0.59	
GK-9 20.0	Light Brown Sandy CLAY (CL)	121.3	94.3	28.6		98.1	0.79	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: | Project Description:

Location:

Borehole Depth Elev.	Specimen Description (LL, PL, PI, Fines)	Wet Density	Dry Density	Water Content	Specific Gravity	% Saturation	Void Ratio	Porosity
GK-10 5.0	Light Brown Silty SAND with Gravel (SM) Fines: 14.9	124.4	121.0	2.9		19.7	0.39	
GK-10 10.0	Light Brown Clayey SAND (SC)	132.2	119.6	10.5		69.2	0.41	
GK-10 15.0	Light Brown Sandy GRAVEL (GP) Fines: 4.9	136.4	131.6	3.6		34.8	0.28	
GK-10 20.0	Light Brown Silty (fine) SAND (SM)	122.5	103.4	18.5		79.1	0.63	
GK-10 25.0	Light Brown Silty (fine) SAND (SM)	112.6	104.6	7.6		33.6	0.61	
GK-10 30.0	Light Brown Clayey SAND (SC) Fines: 46.5	131.0	109.3	19.8		98.7	0.54	
GK-10 35.0	Light Brown Silty CLAY (CL)	130.5	109.7	19.0		94.3	0.55	
GK-10 40.0	Light Brown Sandy CLAY (CL)	132.4	111.1	19.2		98.8	0.53	
GK-10 45.0	Light Brown Sandy CLAY (CL)	129.8	115.9	12.0		71.2	0.45	
GK-10 50.0	Light Brown Silty CLAY (CL)	131.1	111.2	17.9		93.6	0.52	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer | Job Number: 1957 | Sheet 1 of 1

Tested by: | Project Description:

Location:

Borehole Depth Elev.	Specimen Description LL PL PI Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-11 5.0	Dark Brown Silty (fine) SAND (SM)	112.1	103.7	8.1		34.9	0.63	
GK-11 10.0	Dark Brown Clayey SAND (SC)	134.1	117.6	14.0		87.1	0.43	
GK-11 15.0	Brown Silty SAND (SM) 18.4	132.9	126.5	5.0		41.0	0.33	
GK-11 20.0	Light Brown Poorly Graded SAND with Gravel (SP)	126.1	121.8	3.6		25.2	0.38	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers

Project: Deboer Job Number: 1957

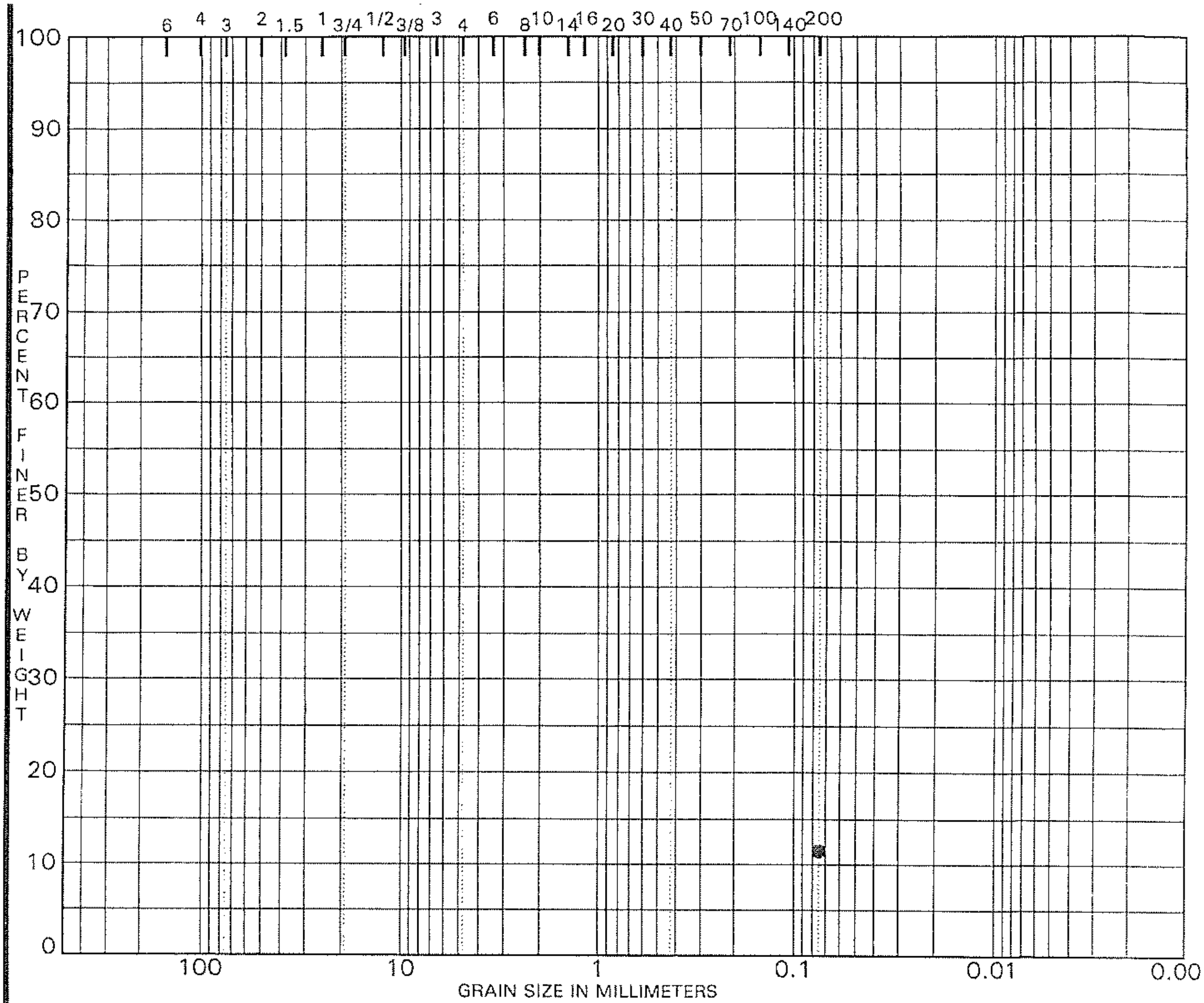
Tested by: Project Description:

Location:

Borehole Depth Elev.	Specimen Description	LL	PL	PI	Fines	Wet Density	Dry Density	Water Content	Specific Gravity	Sample Data % Saturation	Void Ratio	Porosity
GK-12 5.0	Dark Brown Poorly Graded SAND with Silt and Gravel (SP-SM)					125.2	115.4	8.5		49.5	0.46	
GK-12 10.0	Light Brown Poorly Graded SAND with Gravel (SP)					120.7	118.0	2.3		14.4	0.43	
GK-12 15.0	Grayish Brown Poorly Graded SAND with Silt (SP-SM)				11.8	124.5	121.2	2.7		18.8	0.39	
GK-12 20.0	Light Brown Sandy CLAY (CL)					132.0	110.4	19.6		99.1	0.54	

Summary of Material Properties

GeoKinetics
Geotechnical & Environmental Engineers



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

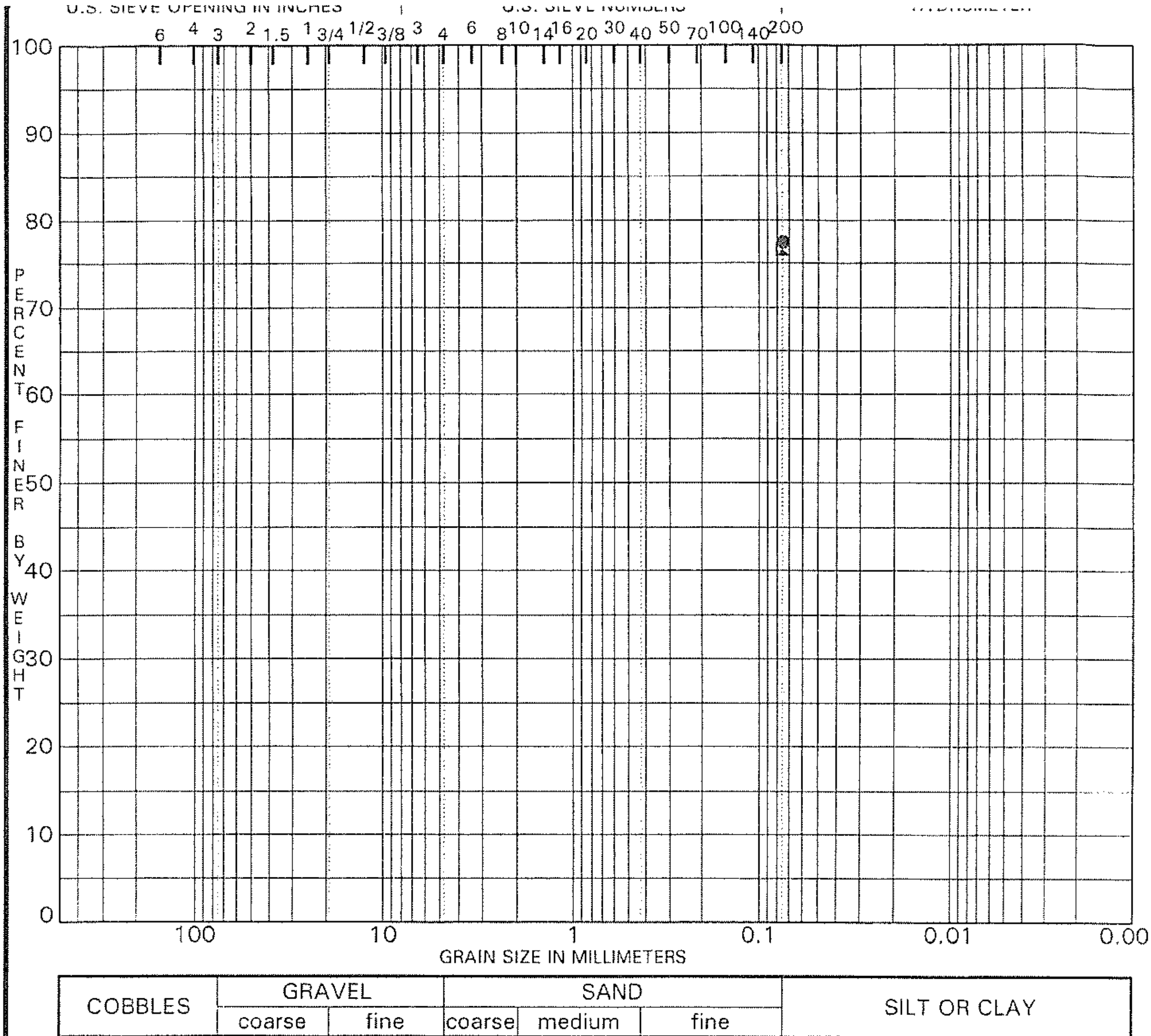
Specimen Identification			Classification
●	GK-1	5.0	**Brown Poorly Graded SAND with Silt (SP-SM)**

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-1	5.0							11.5	

PROJECT **Deboer**

JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



Specimen Identification			Classification
●	GK-2	15.0	Brown Sandy CLAY (CL)
⊠	GK-2	20.0	Brown Sandy CLAY (CL)

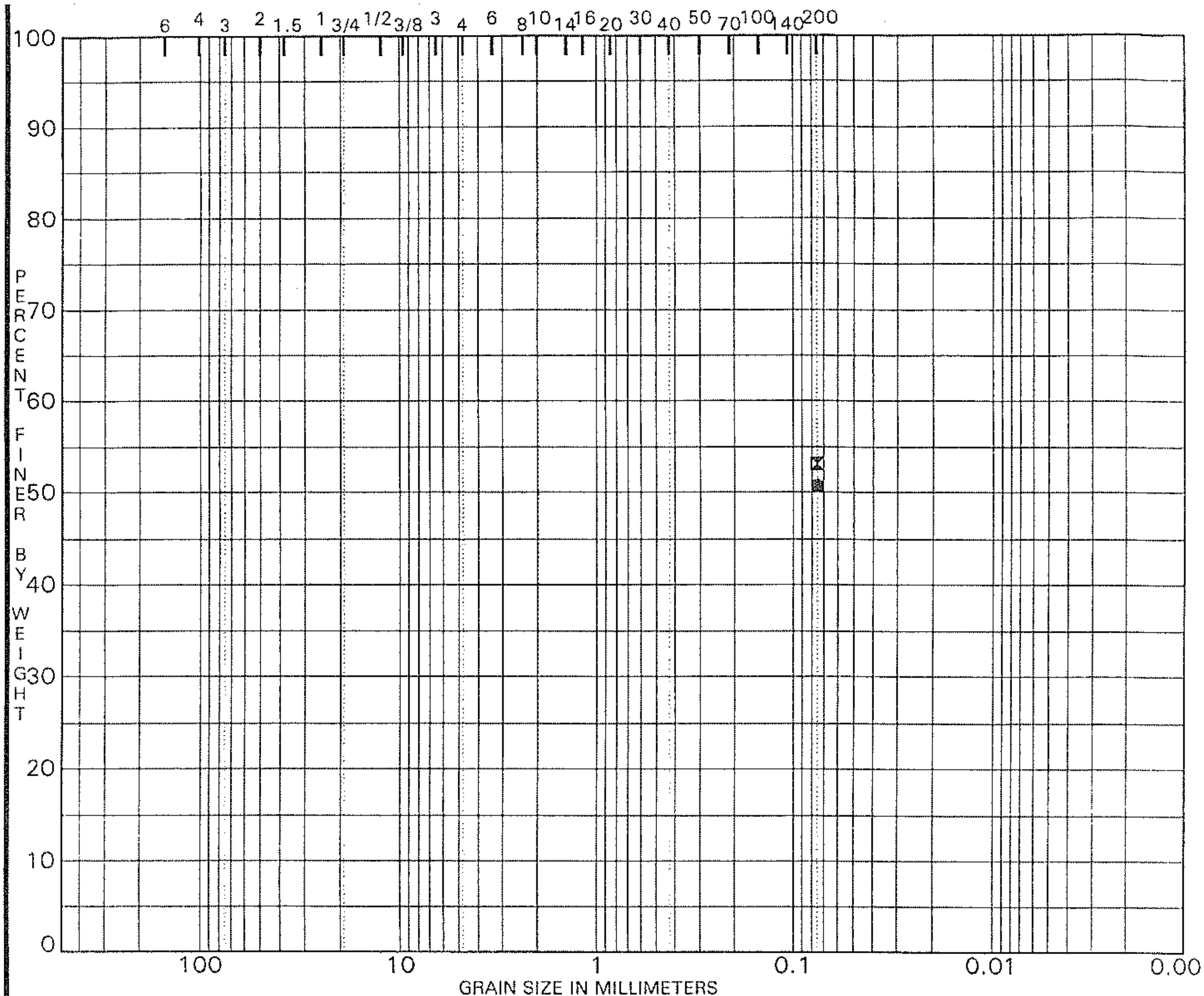
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-2	15.0							77.4	
⊠	GK-2	20.0							76.6	

PROJECT Deboer

JOB NO. 1957

DATE 10/19/04

GRADATION CURVES



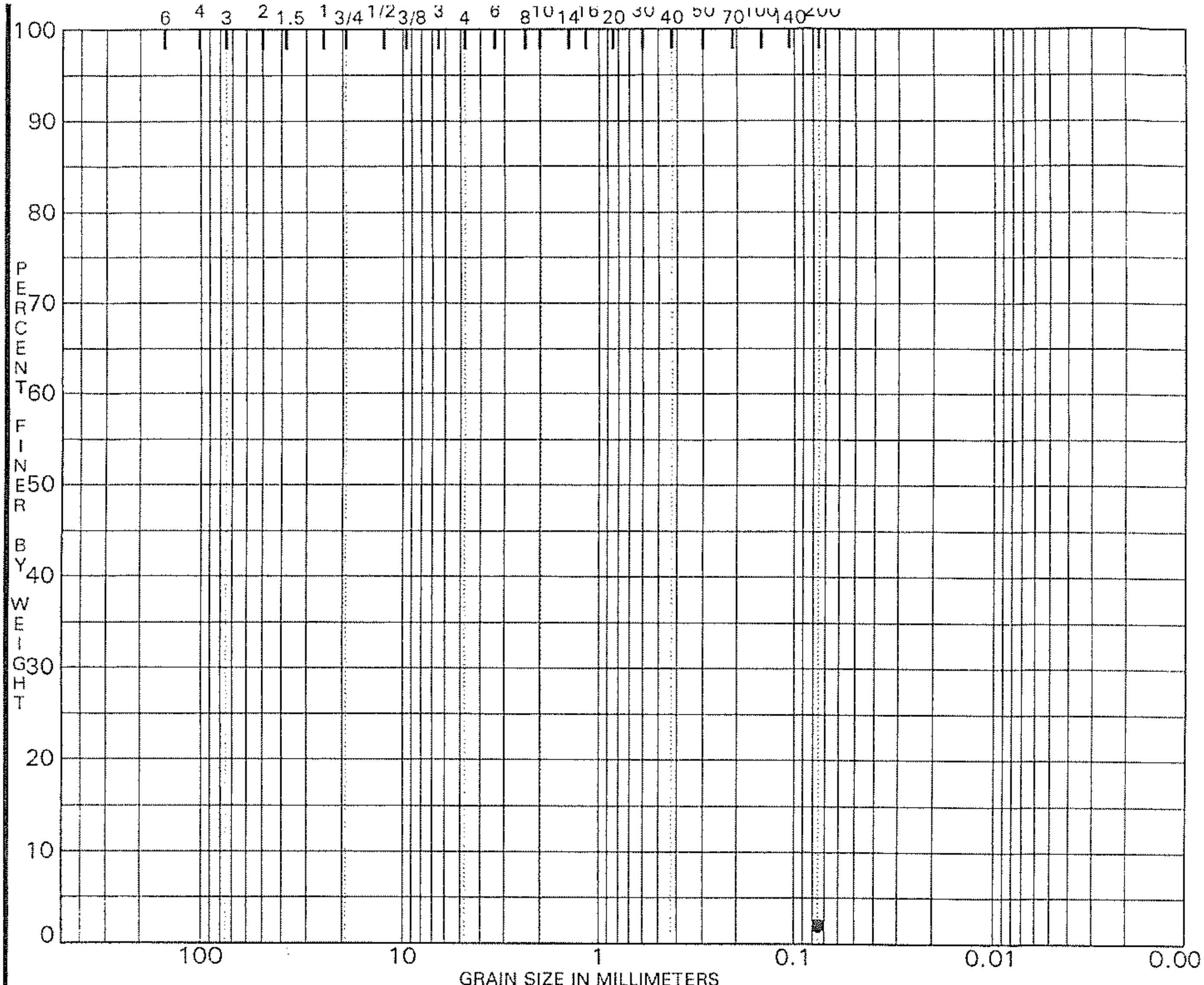
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification
●	GK-3	20.0	Brown Sandy SILT (ML)
⊠	GK-3	25.0	Brown Sandy SILT (ML)

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-3	20.0							50.7	
⊠	GK-3	25.0							53.2	

PROJECT **Deboer** JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification
● GK-4	10.0	Brown Poorly Graded SAND (SP)

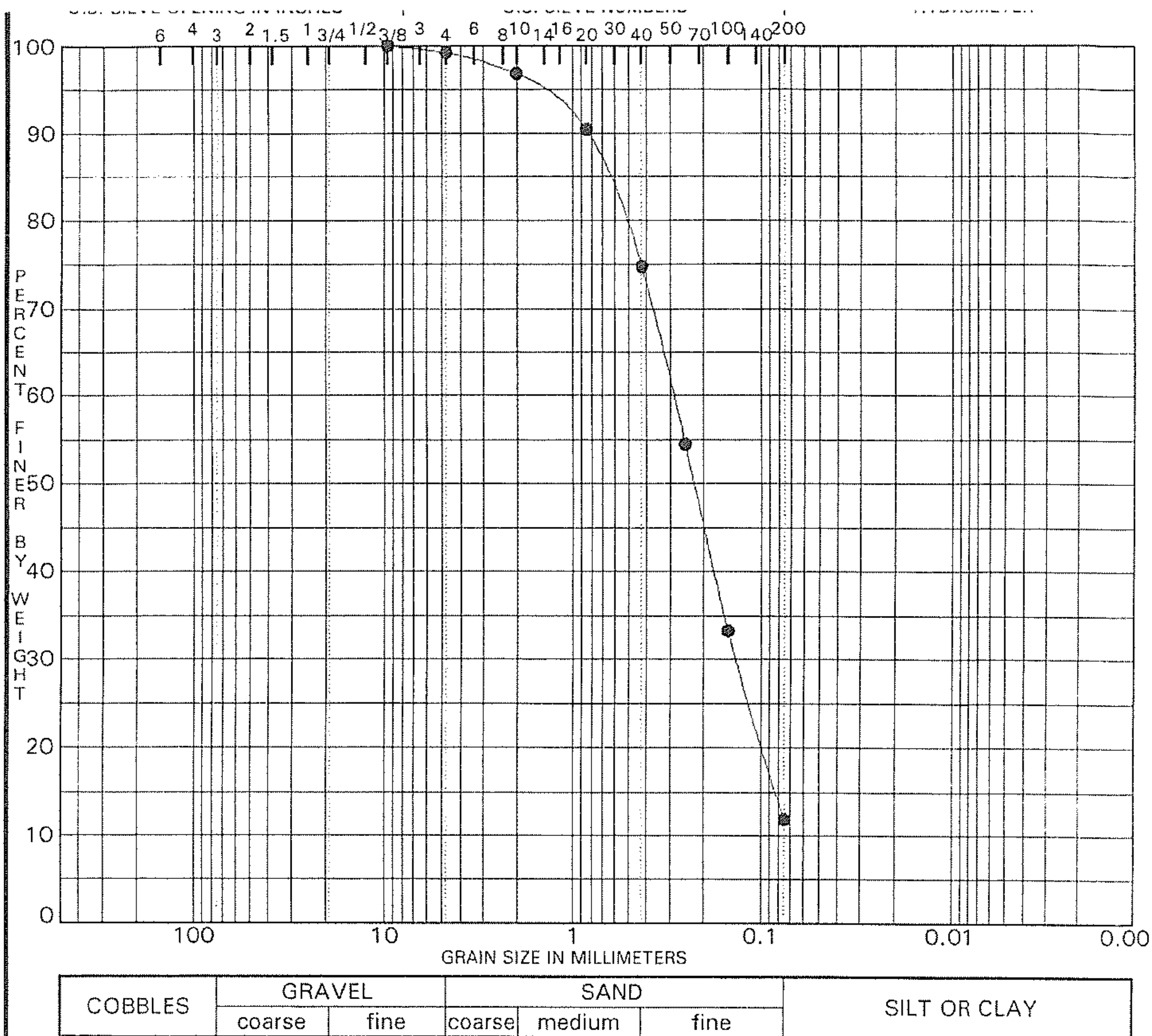
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● GK-4	10.0							2.1	

PROJECT · Deboer

JOB NO. 1957

DATE 10/19/04

GRADATION CURVES



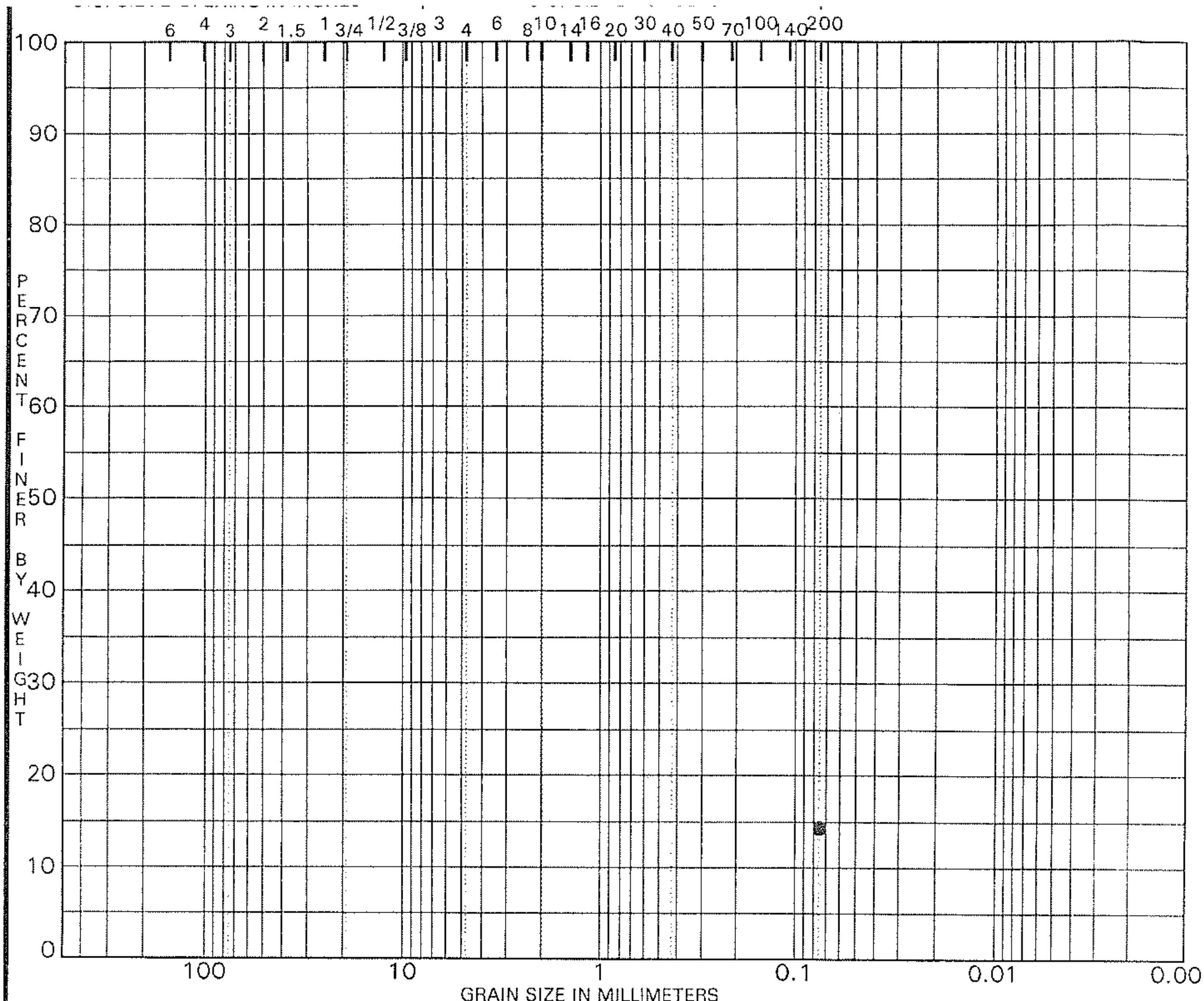
Specimen Identification			Classification
●	GK-5	5.0	Dark Gray Poorly Graded SAND with Silt (SP-SM)

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-5	5.0	9.50	0.29	0.135		0.8	87.3	11.9	

PROJECT Deboer

JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

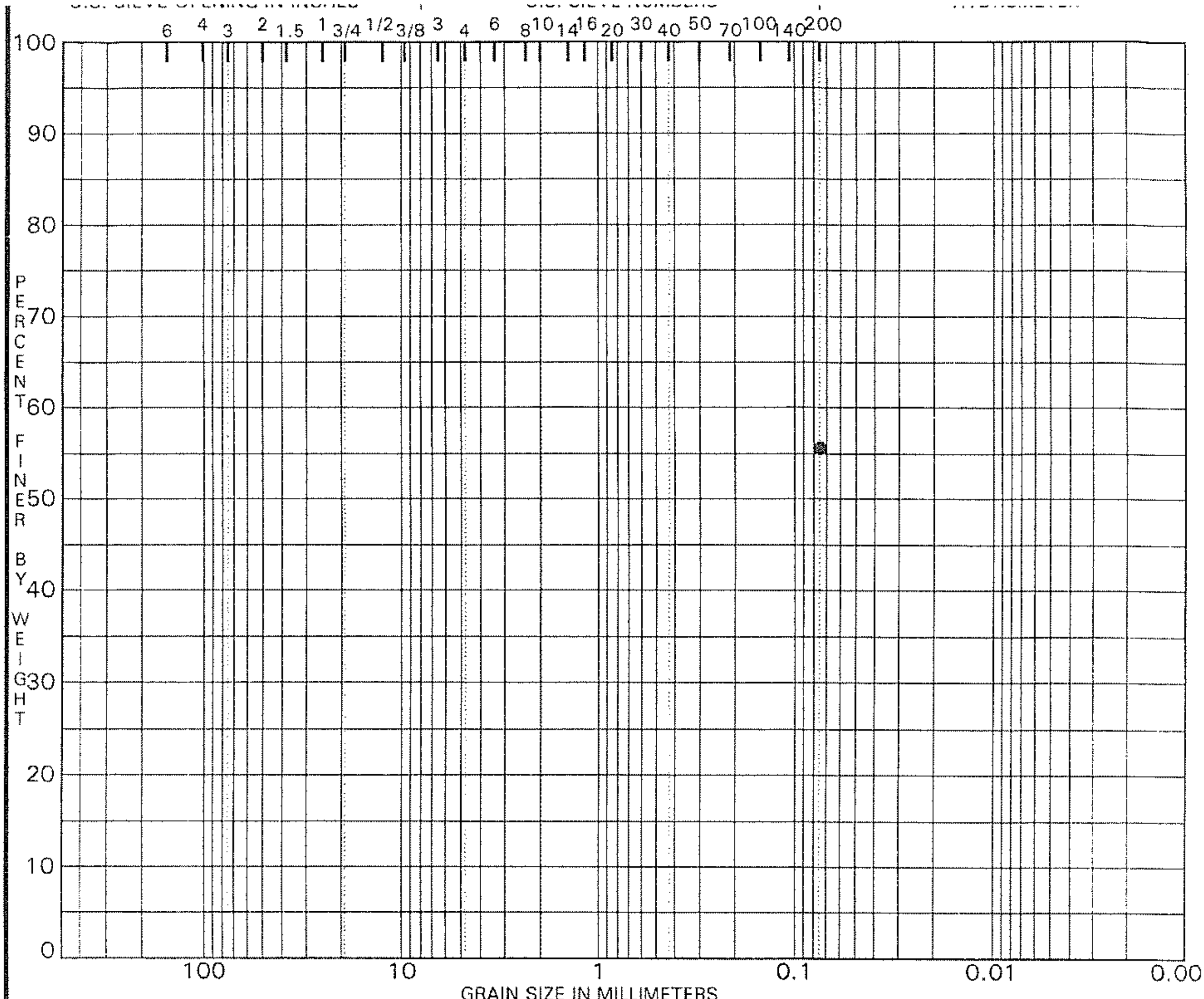
Specimen Identification		Classification
● GK-6	5.0	Brown Silty SAND (SM)

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● GK-6	5.0							14.3	

PROJECT Deboer

JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



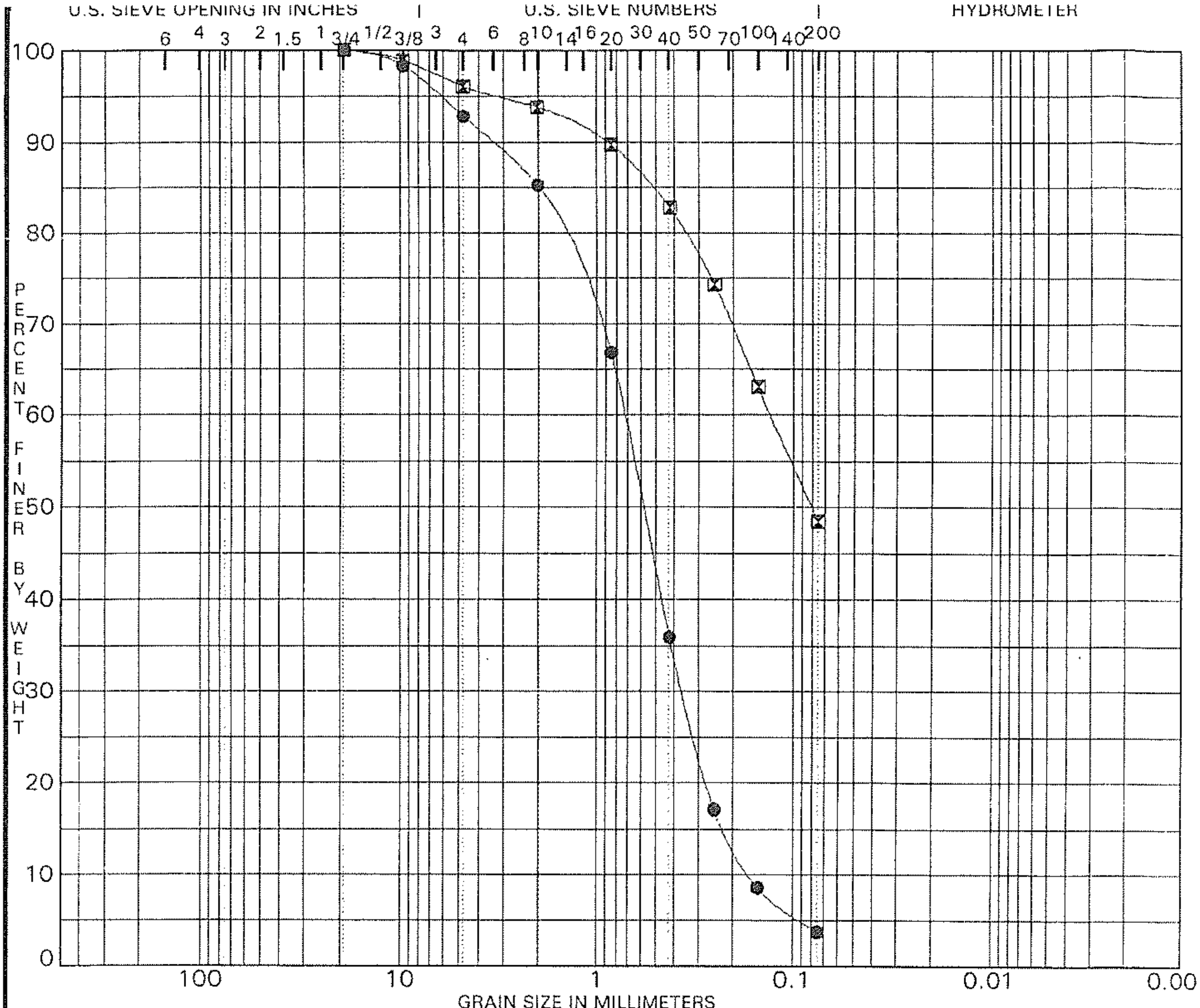
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification
●	GK-7	10.0	Dark Brown Sandy SILT (ML)

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-7	10.0							55.6	

PROJECT Deboer JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification
●	GK-8	5.0	Brown Poorly Graded SAND (SP)
⊠	GK-8	10.0	Brown Clayey SAND (SC)

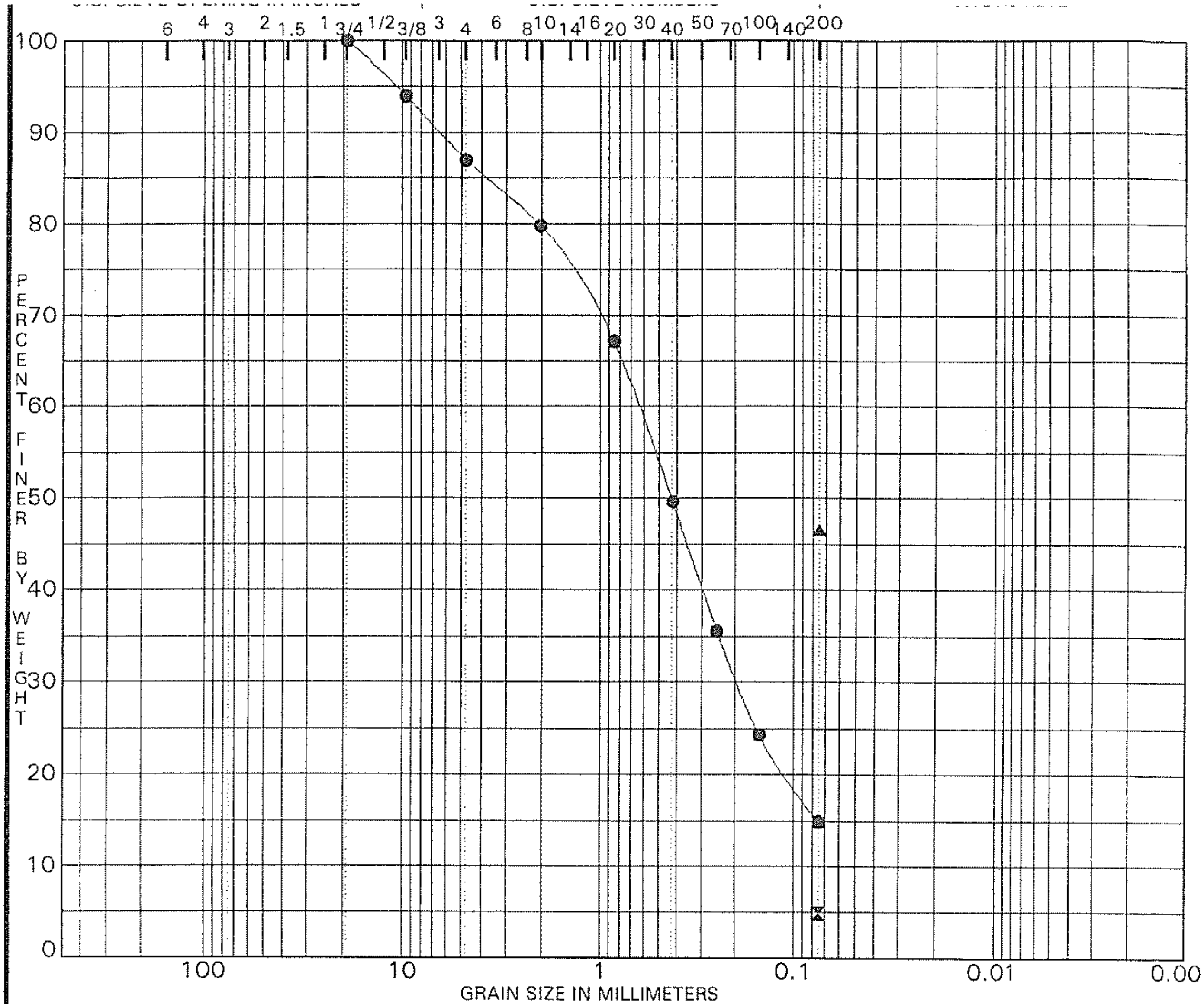
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-8	5.0	19.00	0.73	0.360	0.1632	7.2	89.0	3.8	
⊠	GK-8	10.0	19.00	0.13			3.9	47.6	48.5	

PROJECT Deboer

JOB NO. 1957

DATE 10/19/04

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification
GK-10	5.0	Light Brown Silty SAND with Gravel (SM)
GK-10	15.0	Light Brown Sandy GRAVEL (GP)
GK-10	30.0	Light Brown Clayey SAND (SC)

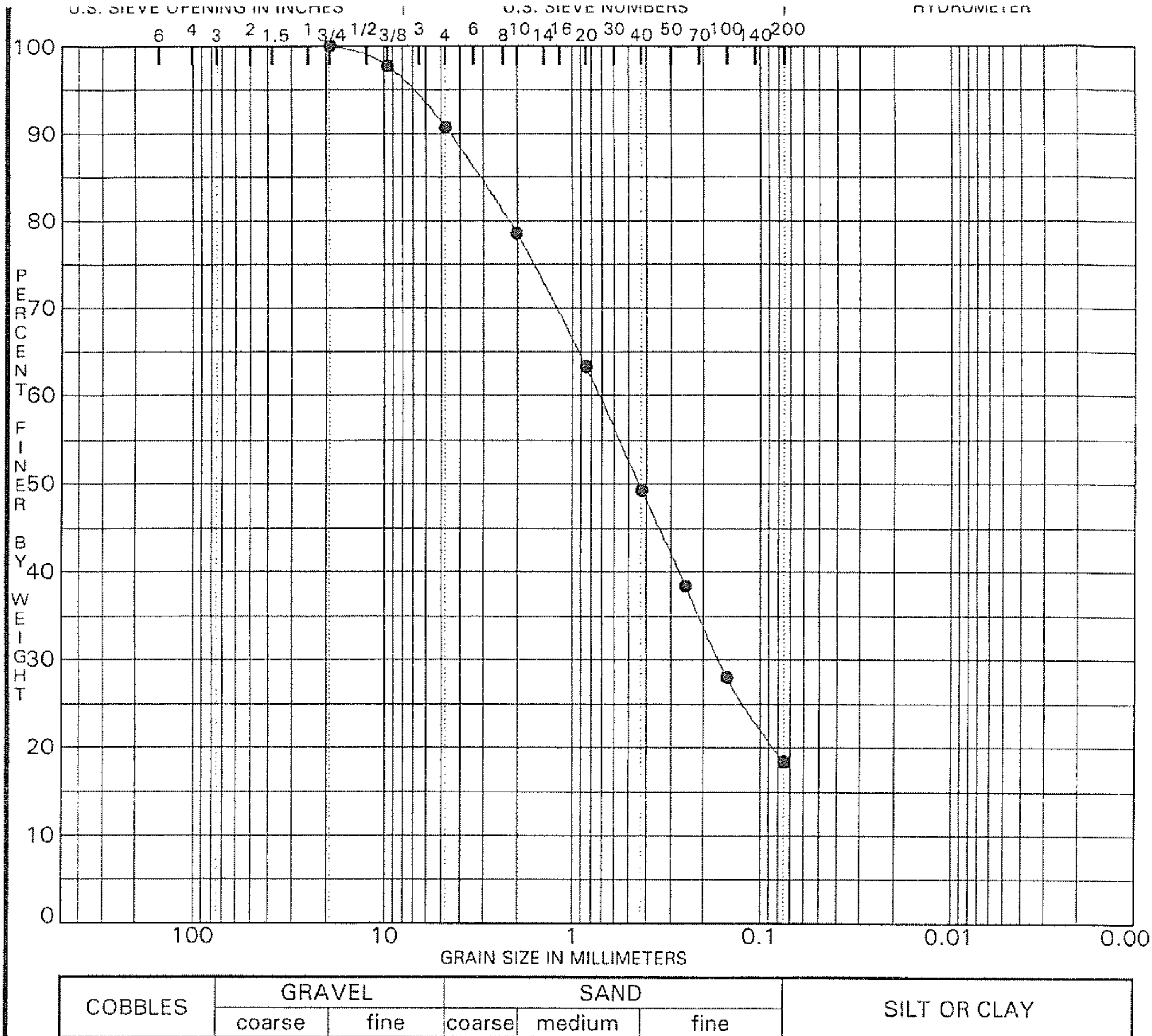
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
GK-10	5.0	19.00	0.64	0.194		13.1	72.0	14.9	
GK-10	15.0							4.9	
GK-10	30.0							46.5	

PROJECT Deboer

JOB NO. 1957

DATE 10/19/04

GRADATION CURVES



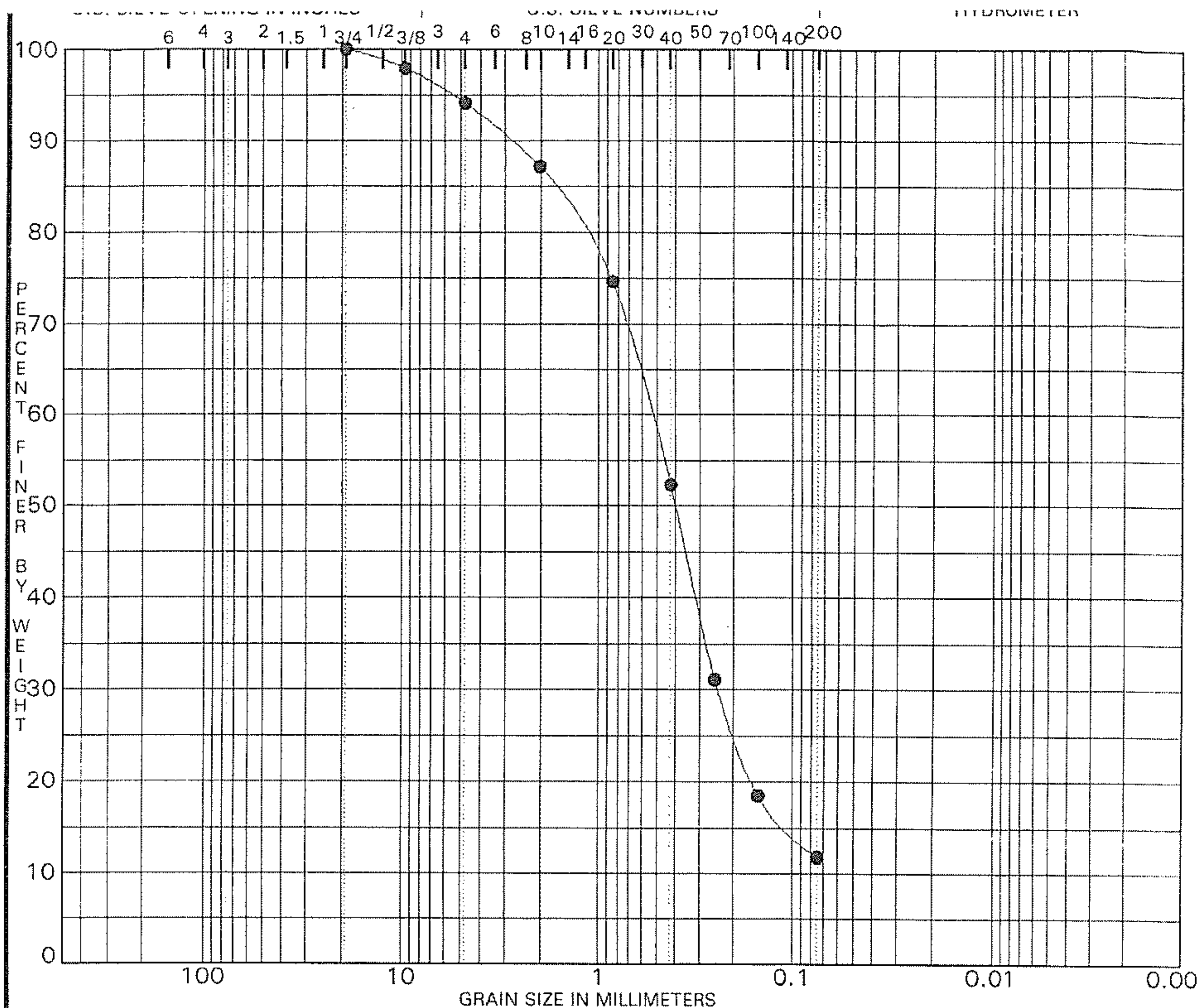
Specimen Identification		Classification
● GK-11	15.0	Brown Silty SAND (SM)

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● GK-11	15.0	19.00	0.72	0.166		9.3	72.3	18.4	

PROJECT Deboer

JOB NO. 1957
DATE 10/19/04

GRADATION CURVES



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification
●	GK-12	15.0	Grayish Brown Poorly Graded SAND with Silt (SP-SM)

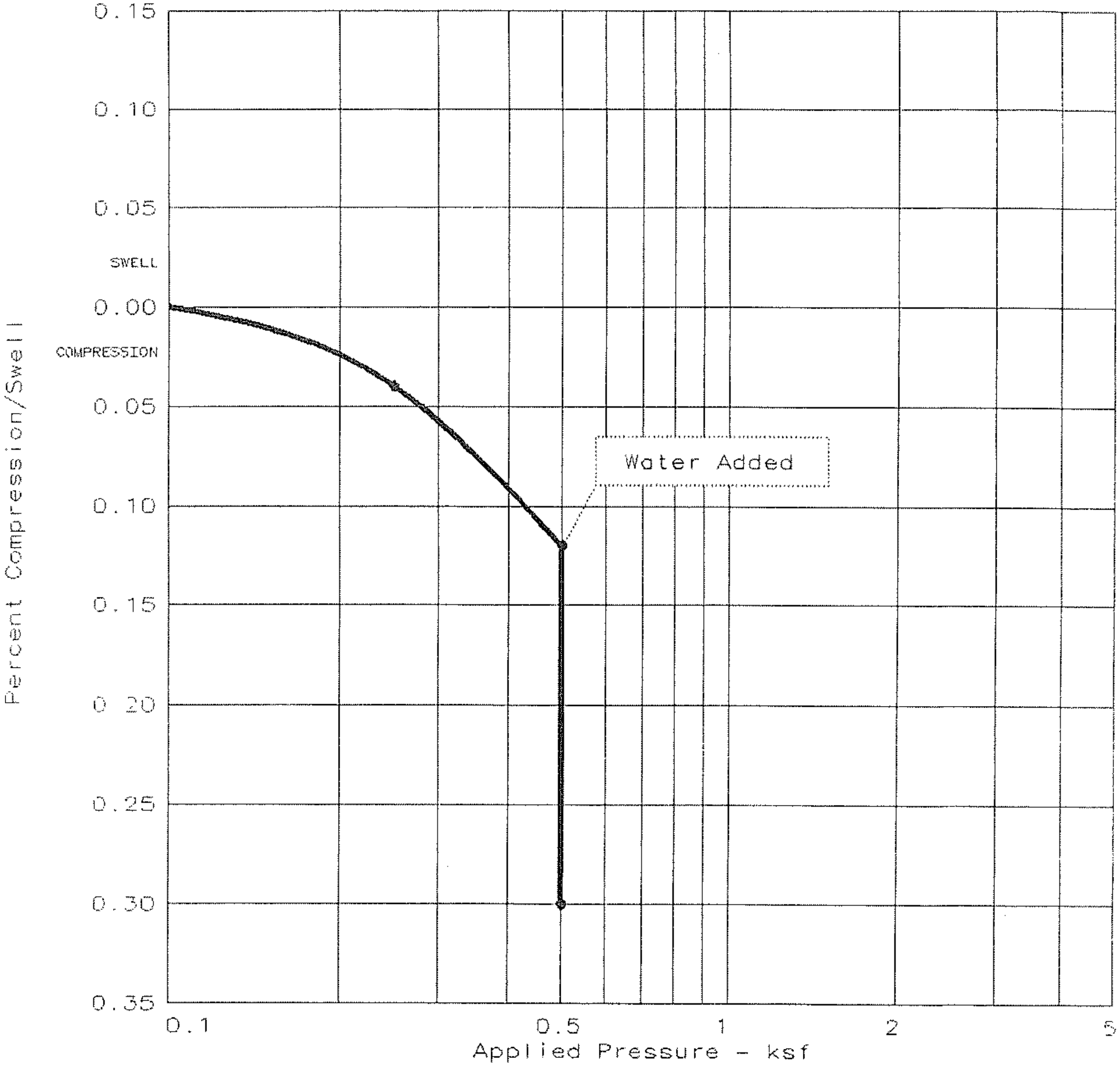
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GK-12	15.0	19.00	0.54	0.239		5.9	82.3	11.8	

PROJECT Deboer

JOB NO. 1957
DATE 10/19/04

GRADATION CURVES

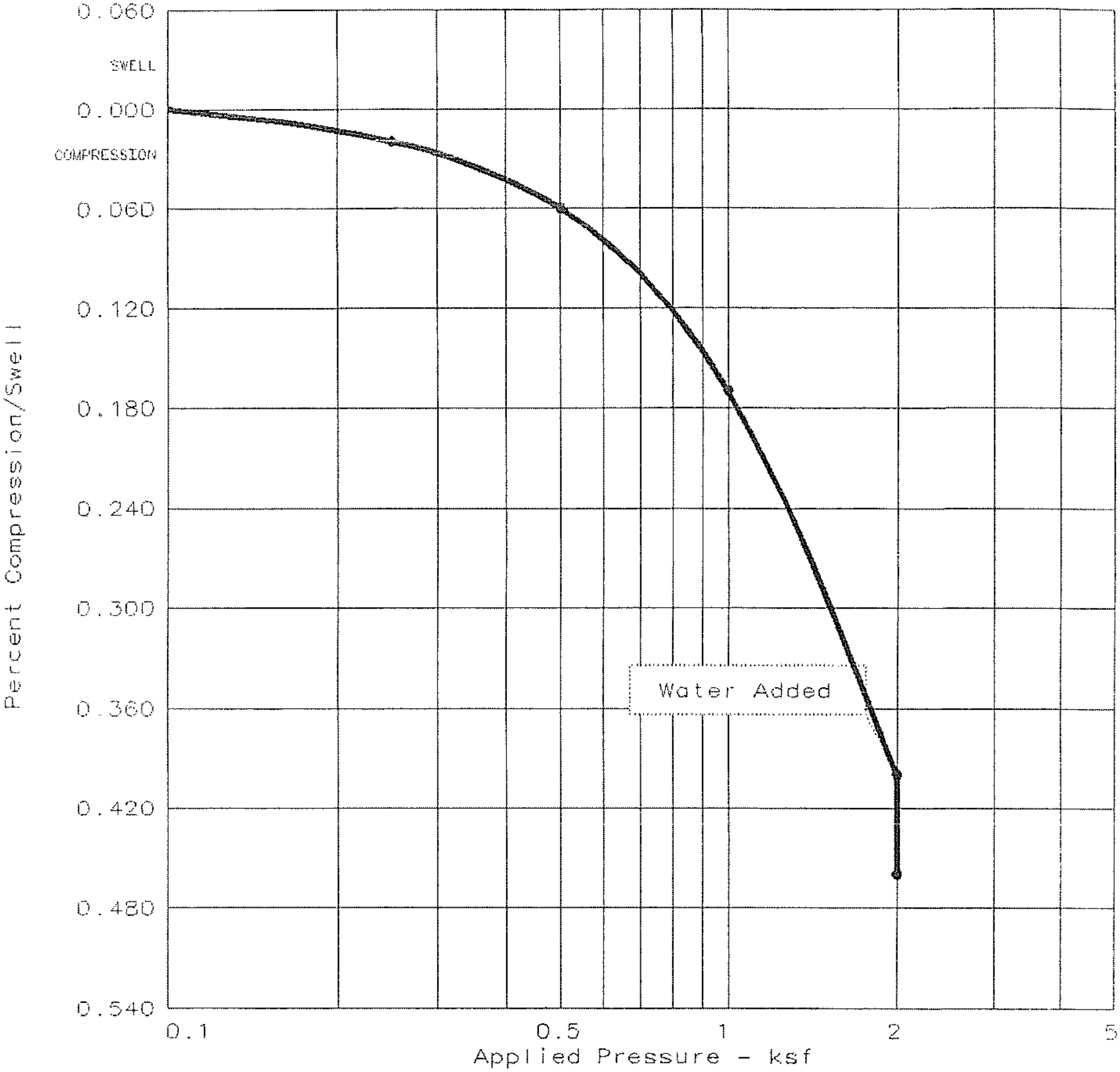
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	27.0 %	5.7	106.8	N/P	N/P	2.680	0.5665

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Poorly Graded SAND Class: SP
Project No.: 1957 Project: Deboer Location: GK-1 @ 5.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De01

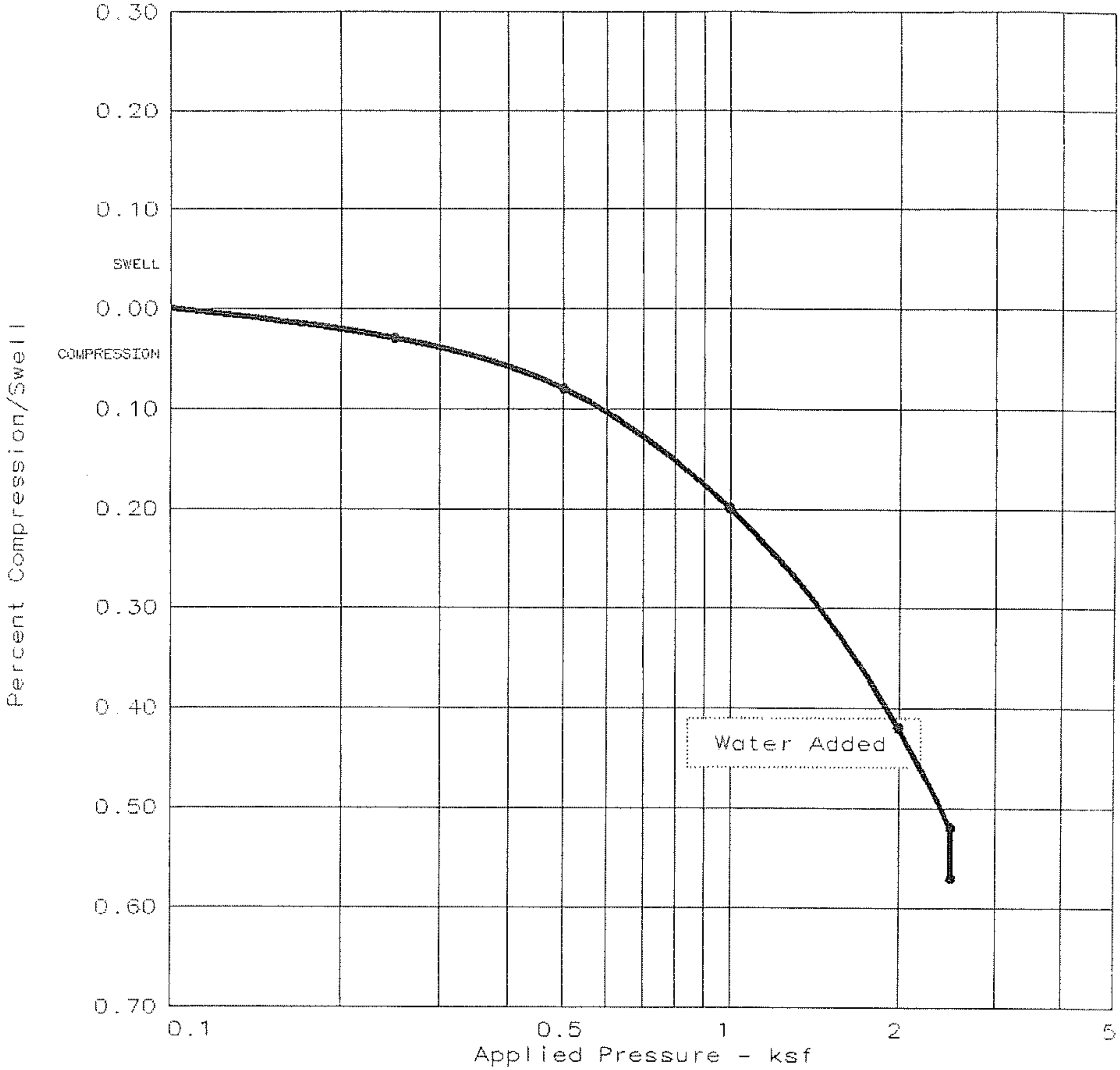
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.1	93.1 %	21.4	104.1	N/A	N/A	2.700	0.6195

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Silty CLAY Class: CL
Project No.: 1957 Project: Deboer Location: GK-2 @ 15.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De02

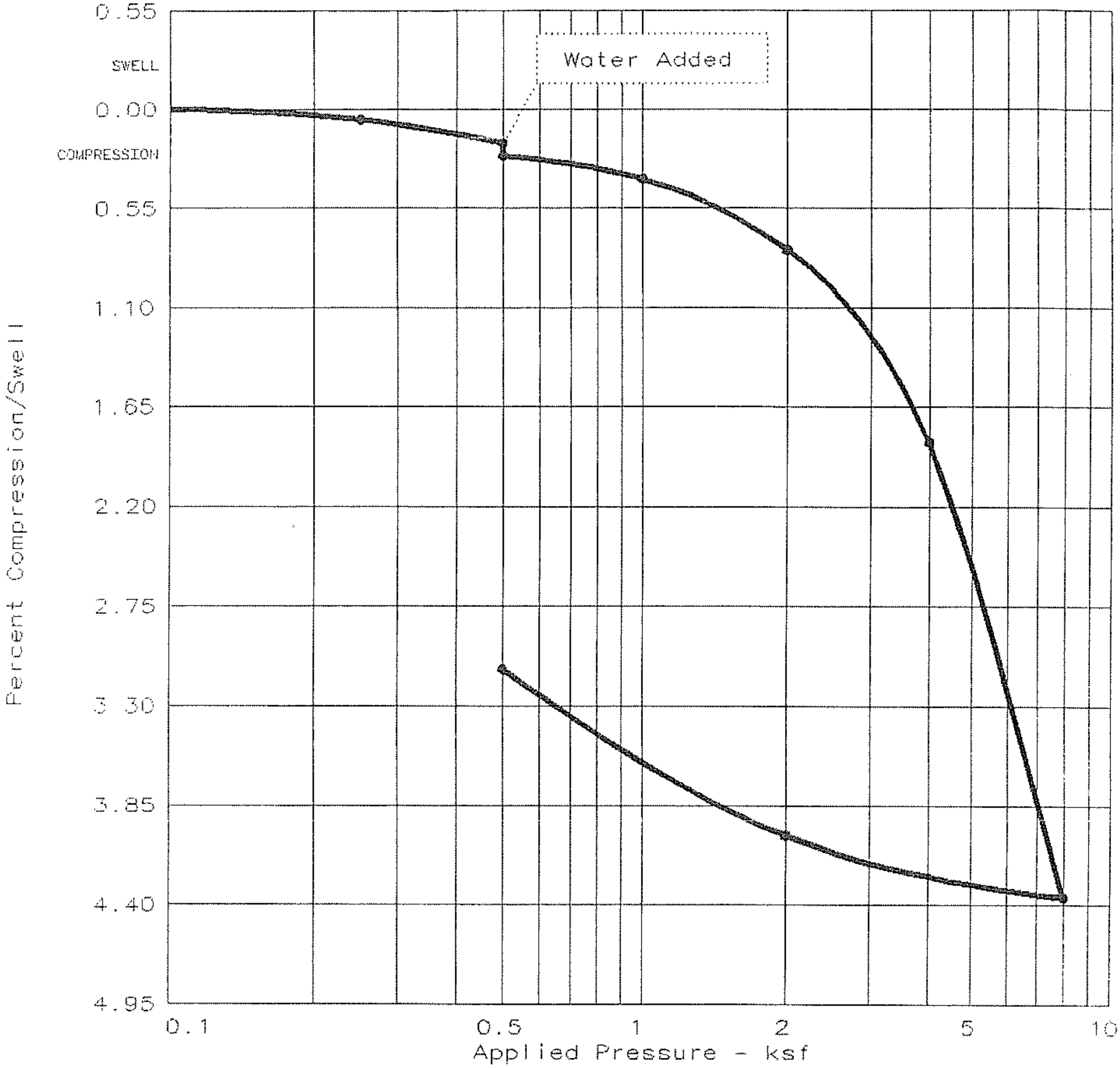
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.1	99.9 %	24.4	101.6	N/A	N/A	2.700	0.6585

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Silty CLAY Class: CL
Project No.: 1957 Project: Deboer Location: GK-2 @ 20.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De03

CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.1	84.9 %	15.4	113.2	N/A	N/A	2.700	0.4887

TEST RESULTS	MATERIAL DESCRIPTION
	Dark Brown Sandy CLAY Class: CL

Project No.: 1957
Project: · Deboer
Location: Gk-3 @ 5.0 Ft.

Date: 10-10-04

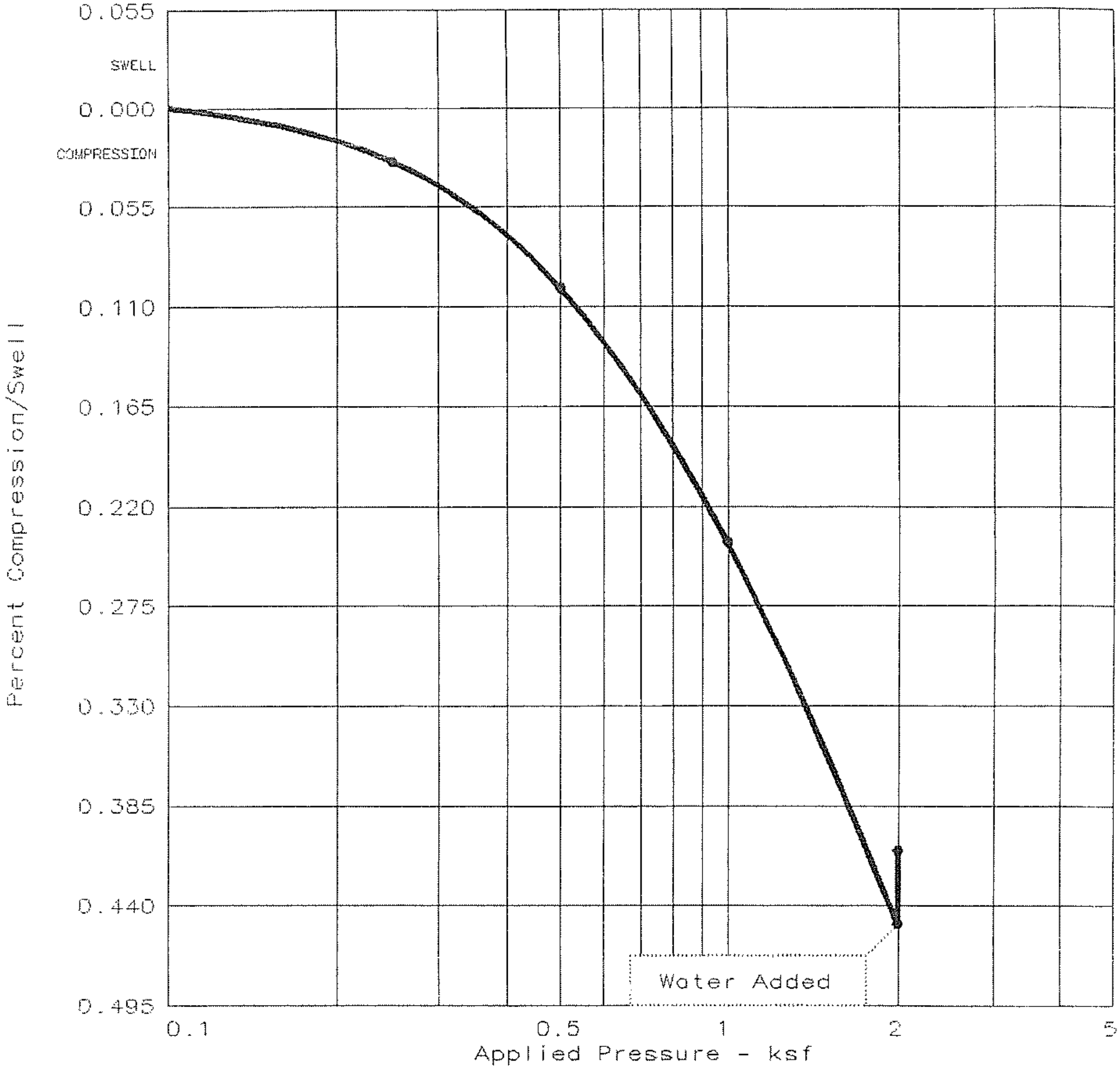
CONSOLIDATION TEST REPORT

Remarks:

Tested by: HVK
Checked by: GDT

Fig. No. _____

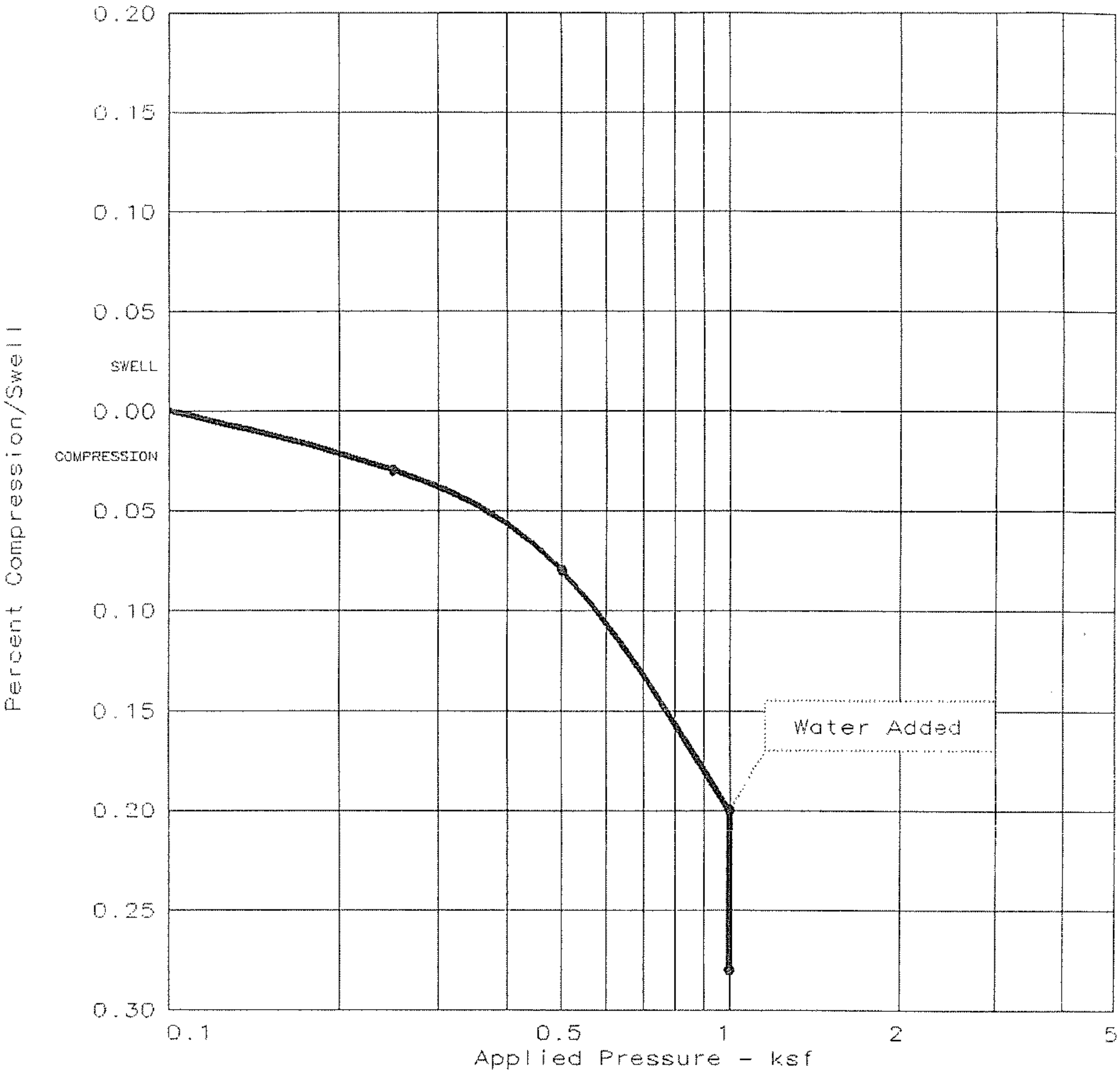
CONSOLIDATION TEST REPORT



Natural Saturation	Natural Moisture	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
56.3 %	11.8	107.5	N/A	N/A	2.700	0.5676

TEST RESULTS	MATERIAL DESCRIPTION
Percent swell = 0.1	Brown Sandy SILT Class: ML
Project No.: 1957 Project: Deboer Location: GK-3 @ 15.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De04

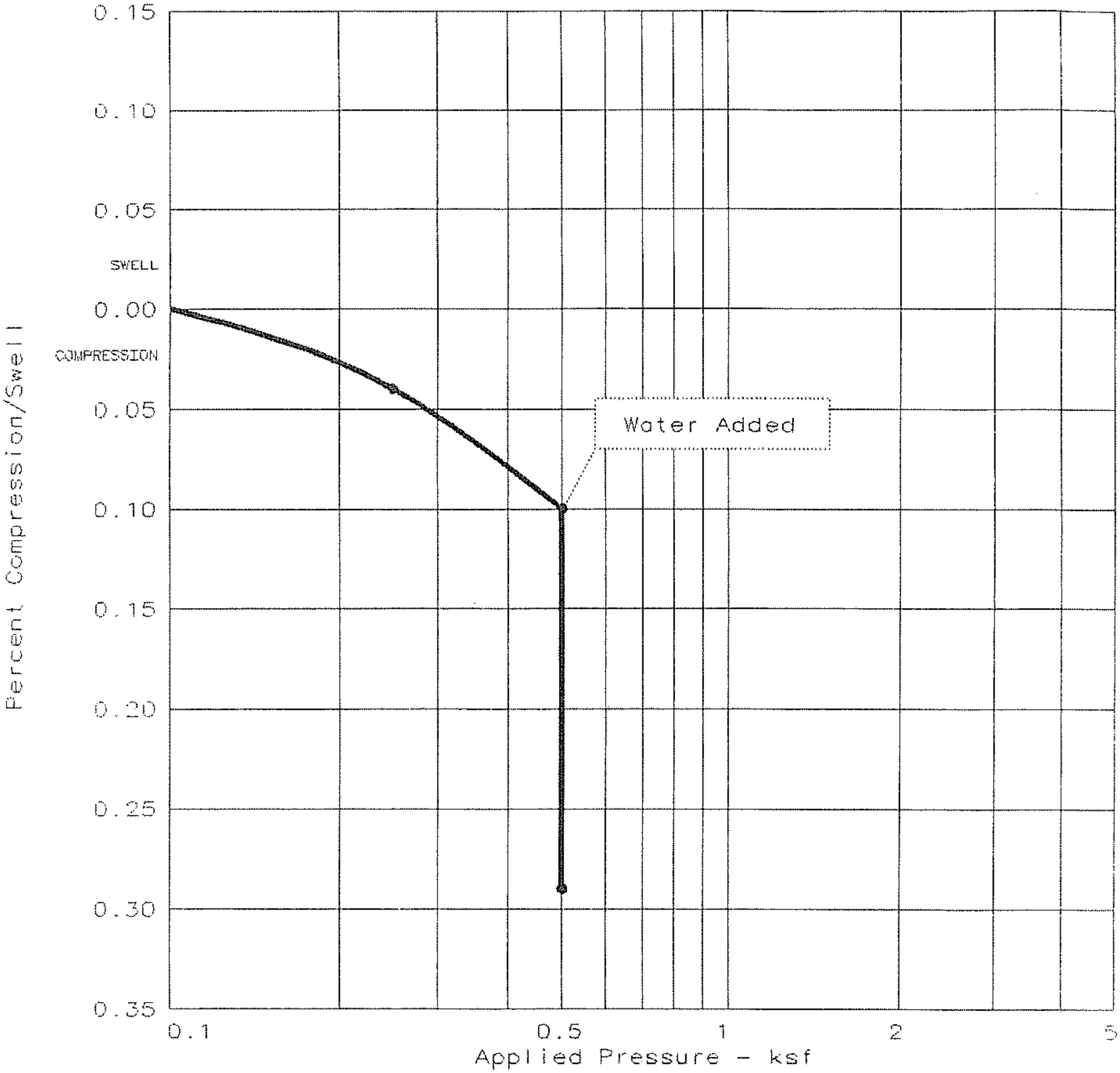
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.1	10.5 %	2.4	104.5	N/A	N/A	2.680	0.6015

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Poorly Graded SAND Class: SP
Project No.: 1957 Project: , Deboer Location: GK-4 @ 10.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De05

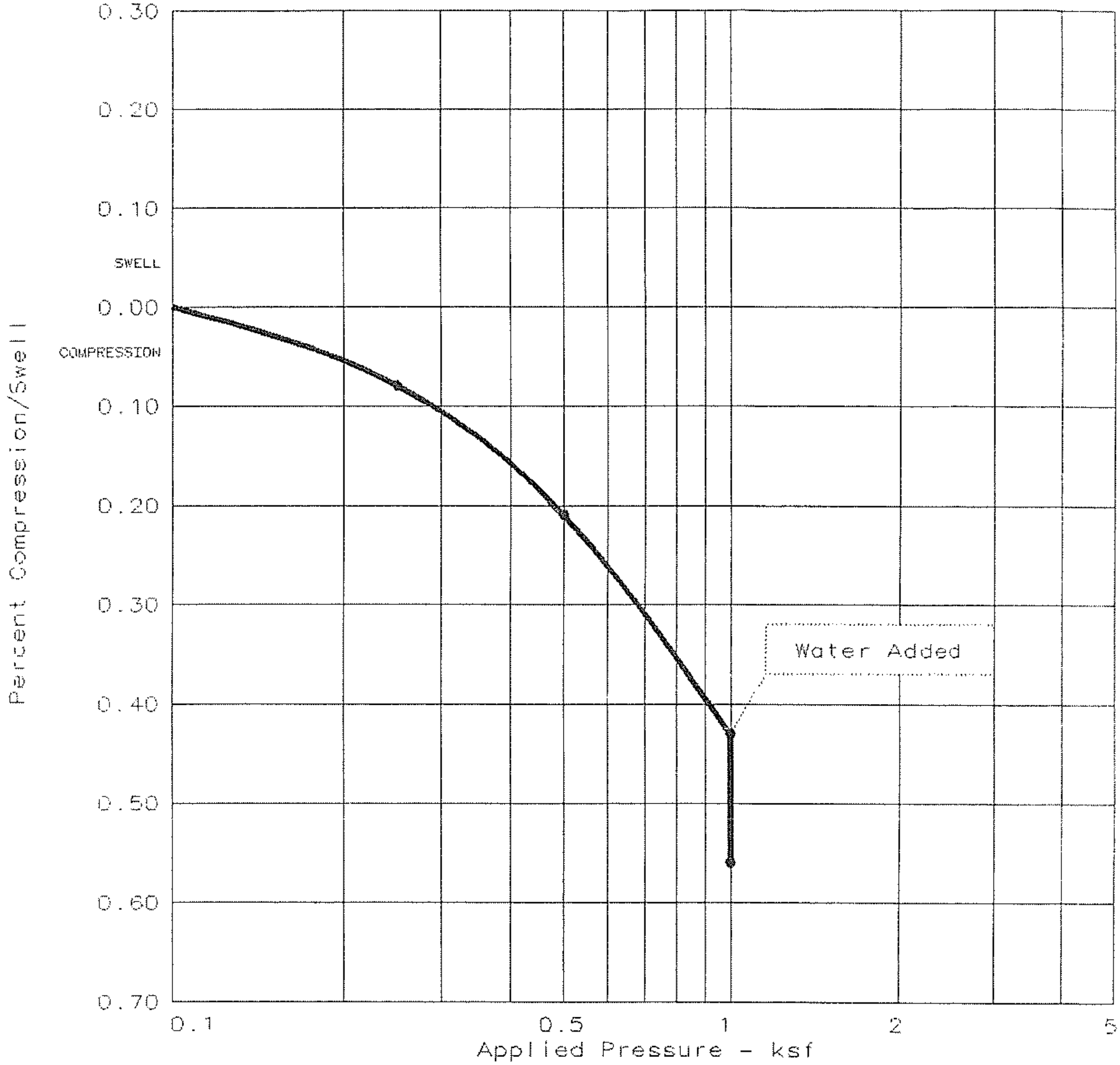
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	30.5 %	6.3	107.6	N/P	N/P	2.680	0.5550

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Silty SAND Class: SM
Project No.: 1957 Project: / Deboer Location: GK-6 @ 5.0 Ft. Date: 10-01-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De06

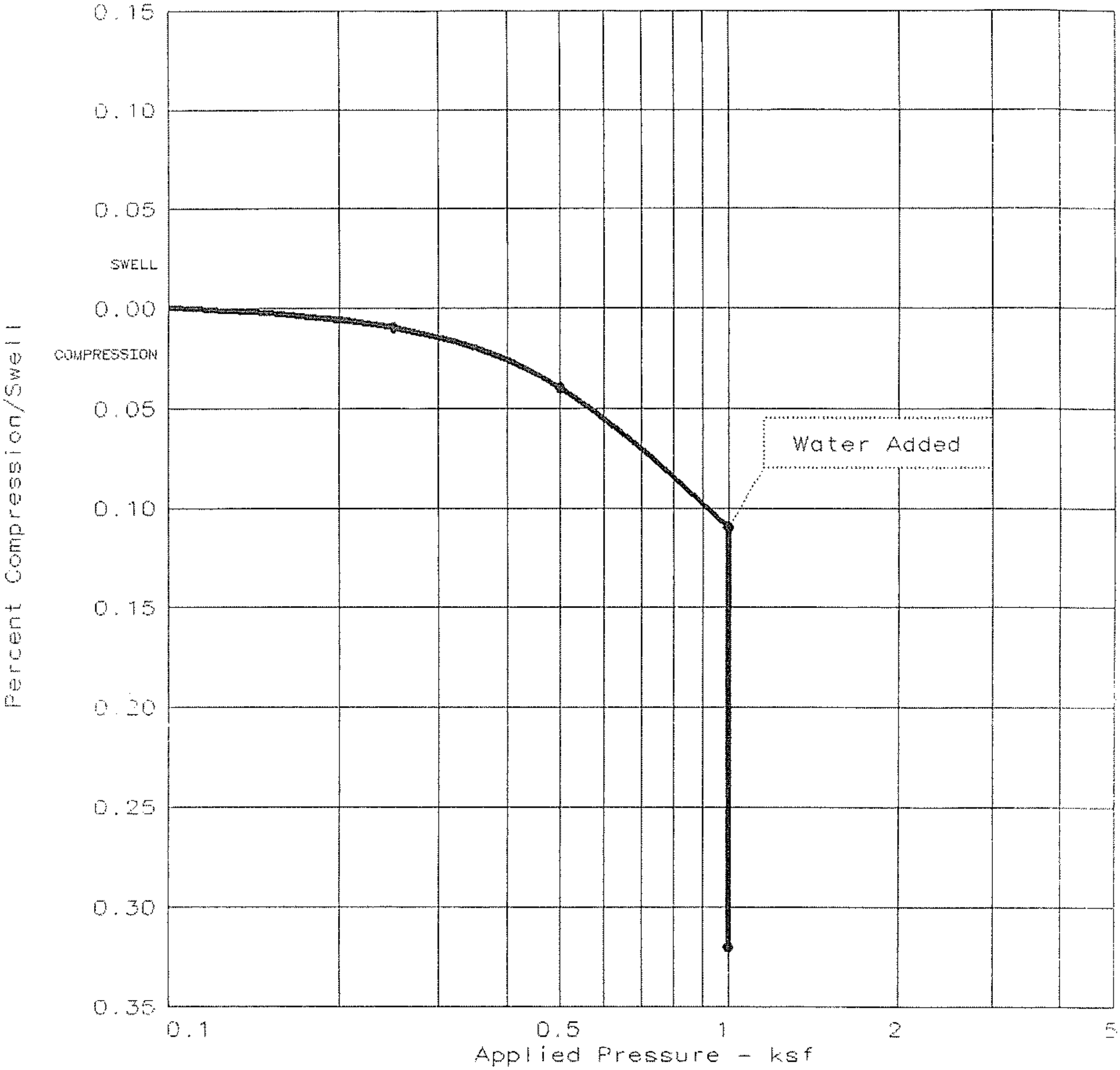
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	97.5 %	20.7	107.1	N/A	N/A	2.700	0.5739

TEST RESULTS	MATERIAL DESCRIPTION
	Dark Brown Sandy SILT Class: ML
Project No.: 1957 Project: . Deboer Location: GK-7 @ 10.0 Ft. Date: 10-05-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. De07

CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	20.1 %	2.9	121.0	N/P	N/P	2.680	0.3825

TEST RESULTS	MATERIAL DESCRIPTION
	Light Brown Silty SAND Class: SM

Project No.: 1957
Project: Deboer
Location: GK-10 @ 5.0 Ft.

Date: 10-05-04

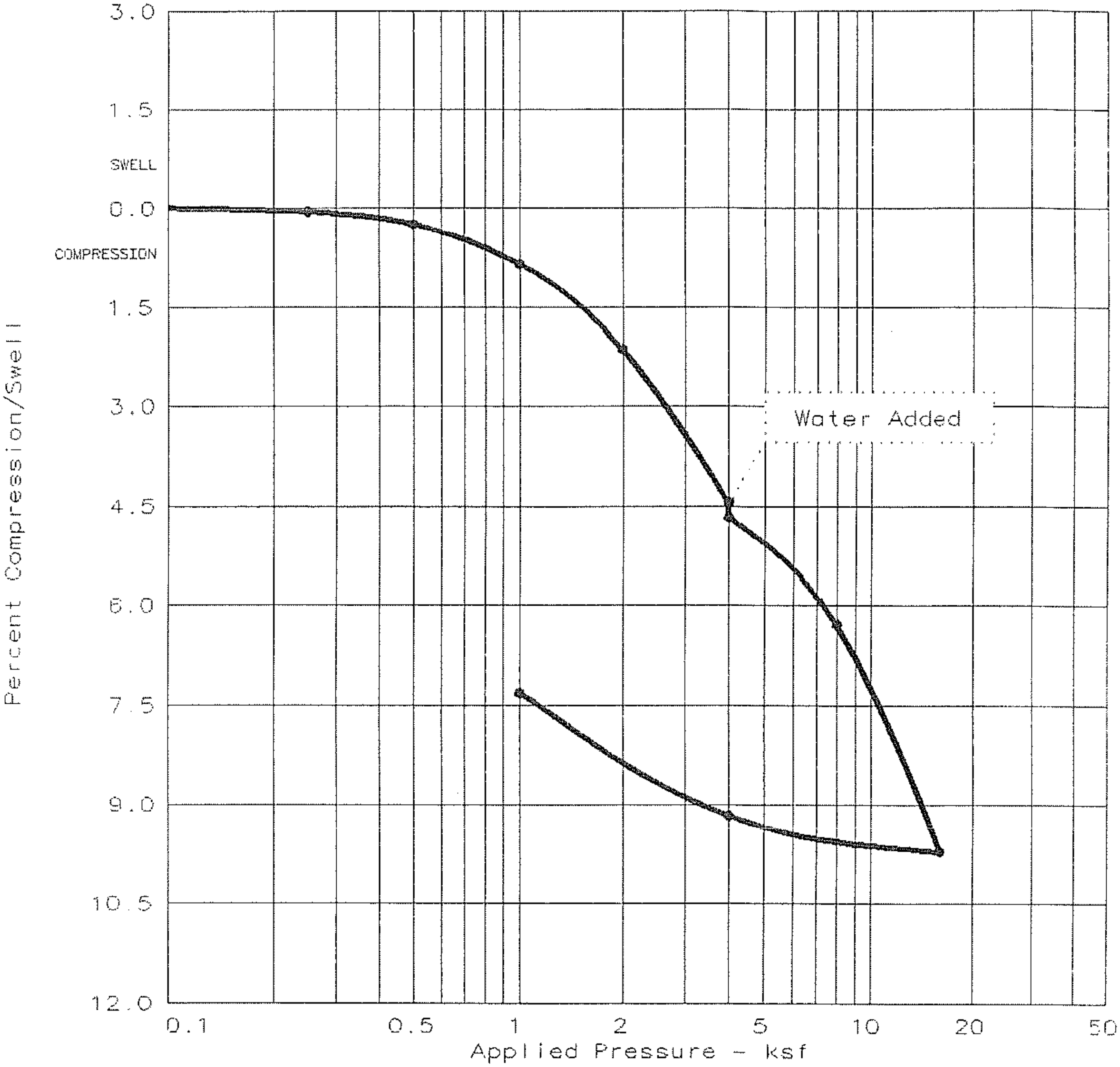
CONSOLIDATION TEST REPORT

Remarks:

Tested by: HVK
Checked by: HVK

Fig. No. De08

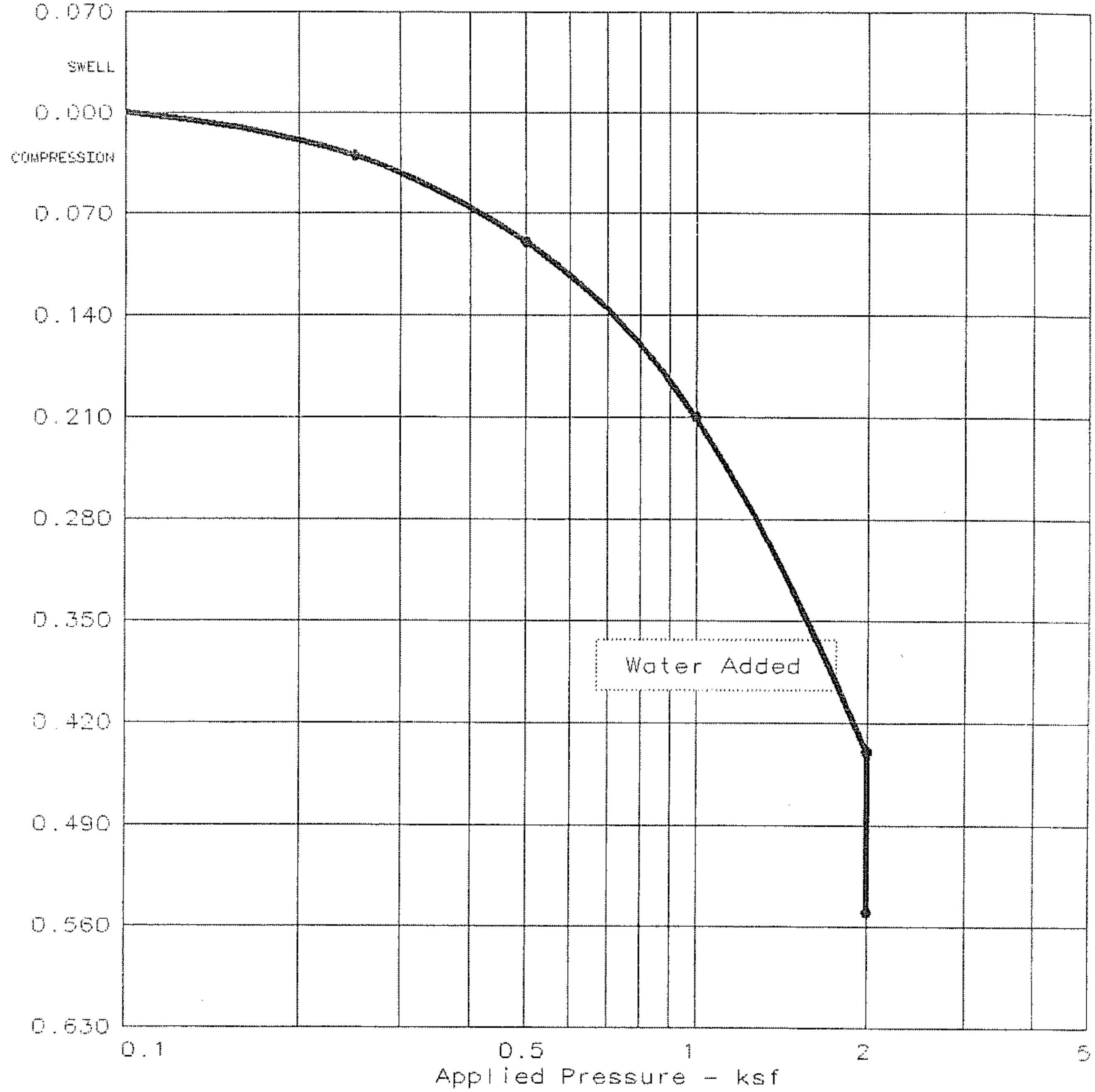
CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	98.9 %	19.8	109.4	N/A	N/A	2.700	0.5406

TEST RESULTS	MATERIAL DESCRIPTION
	Light Brown Clayey SAND Class: SC
Project No.: 1957 Project: Deboer Location: GK-10 @ 30.0 Ft. Date: 10-10-04	Remarks: Tested by: HVK Checked by: GDT
CONSOLIDATION TEST REPORT	Fig. No. ____

CONSOLIDATION TEST REPORT



Clpse. %	Nat. Sat.	Nat. Moist.	Dry Density	LL	PI	Sp.Gr.	Initial void ratio
0.2	42.0 %	5.0	126.6	N/P	N/P	2.680	0.3211

TEST RESULTS	MATERIAL DESCRIPTION
	Brown Silty SAND (SM)
	Class: SM

Project No.: 1957
Project: Deboer
Location: GK-11 @ 15.0 Ft.

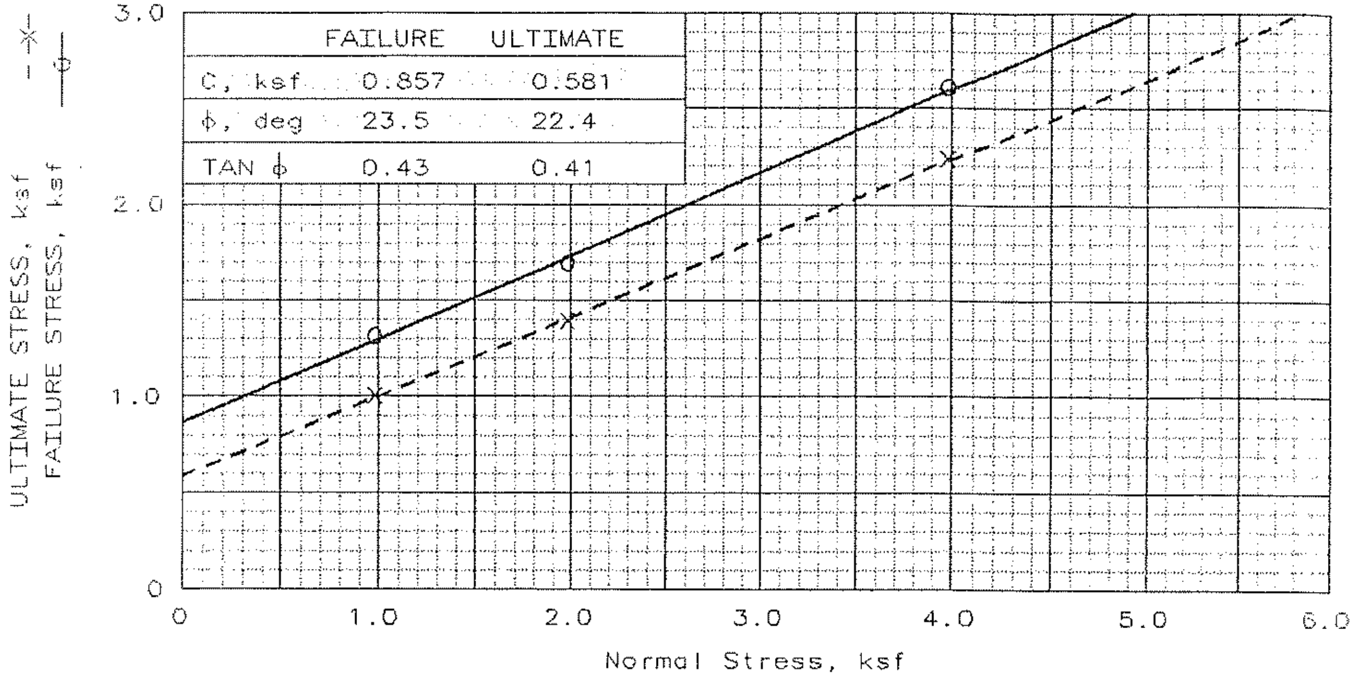
Date: 10-05-04

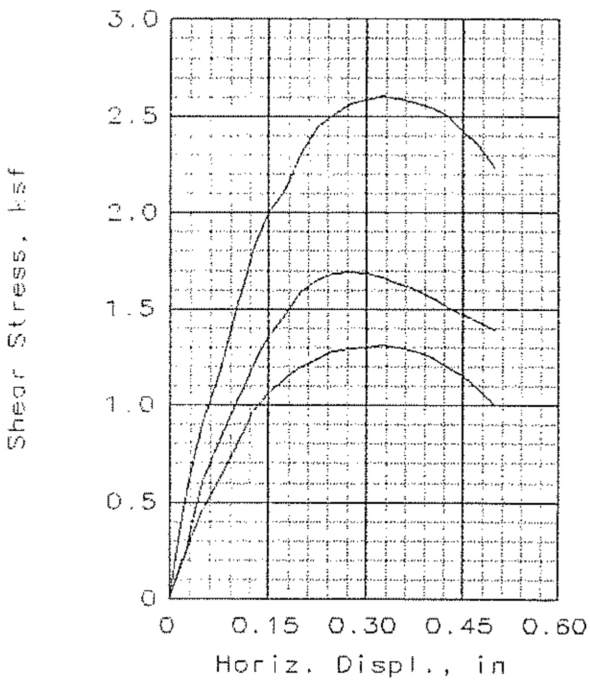
CONSOLIDATION TEST REPORT

Remarks:

Tested by: HVK
Checked by: GDT

Fig. No.______





		1	2	3
INITIAL	WATER CONTENT, %	12.4	12.4	12.4
	DRY DENSITY, pcf	115.8	115.8	115.8
	SATURATION, %	73.8	73.8	73.8
	VOID RATIO	0.455	0.455	0.455
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	2.000	2.000	2.000
AT TEST	WATER CONTENT, %	16.1	16.1	15.5
	DRY DENSITY, pcf	116.9	117.2	118.6
	SATURATION, %	98.4	99.2	99.3
	VOID RATIO	0.442	0.438	0.421
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	1.982	1.977	1.954
NORMAL STRESS, ksf		1.000	2.000	4.000
FAILURE STRESS, ksf		1.312	1.693	2.605
DISPLACEMENT, in		0.325	0.275	0.325
ULTIMATE STRESS, ksf		1.002	1.393	2.234
DISPLACEMENT, in		0.500	0.500	0.500
Strain rate, in/min		0.0075	0.0075	0.0075

SAMPLE TYPE: Undisturbed
DESCRIPTION: Brown Sandy CLAY (CL)

SPECIFIC GRAVITY= 2.7
REMARKS:

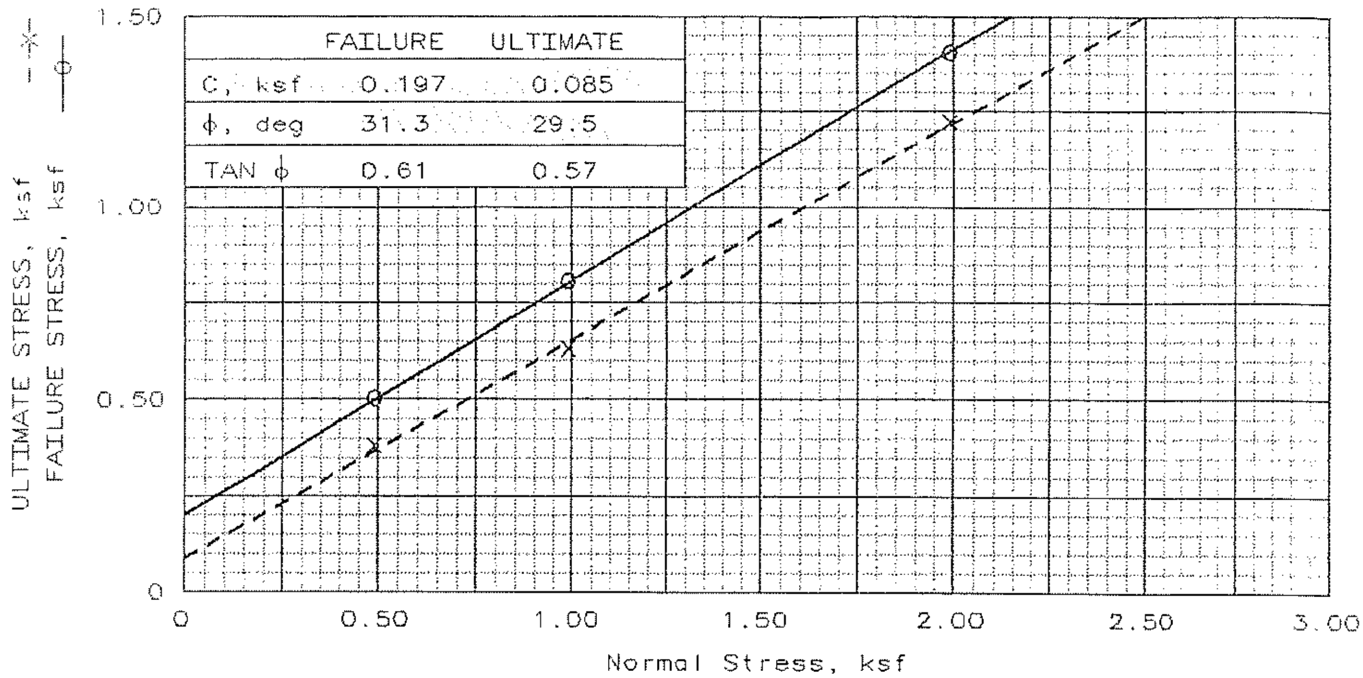
CLIENT:

PROJECT: Deboer

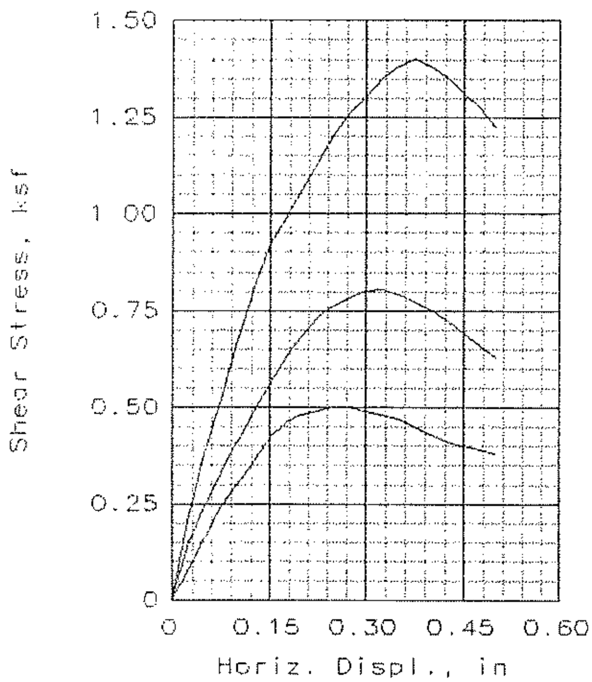
SAMPLE LOCATION: GK-8 @ 10.0 Ft.

PROJ. NO.: 1957 DATE: 10-12-04

DIRECT SHEAR TEST REPORT



	FAILURE	ULTIMATE
C, ksf	0.197	0.085
ϕ, deg	31.3	29.5
TAN ϕ	0.61	0.57



		1	2	3
INITIAL	WATER CONTENT, %	9.3	9.3	9.3
	DRY DENSITY, pcf	106.9	107.0	107.0
	SATURATION, %	43.9	43.7	43.7
	VOID RATIO	0.565	0.569	0.570
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	2.000	2.000	2.000
AT TEST	WATER CONTENT, %	19.5	19.4	18.1
	DRY DENSITY, pcf	107.8	109.3	112.3
	SATURATION, %	94.6	97.4	98.5
	VOID RATIO	0.552	0.536	0.495
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	1.984	1.958	1.905
NORMAL STRESS, ksf		0.500	1.000	2.000
FAILURE STRESS, ksf		0.501	0.804	1.403
DISPLACEMENT, in		0.250	0.325	0.375
ULTIMATE STRESS, ksf		0.381	0.631	1.222
DISPLACEMENT, in		0.500	0.500	0.500
Strain rate, in/min		0.0075	0.0075	0.0075

SAMPLE TYPE: Unditurbed
DESCRIPTION: Dark Gray Silty
SAND (SM)

SPECIFIC GRAVITY= 2.68
REMARKS:

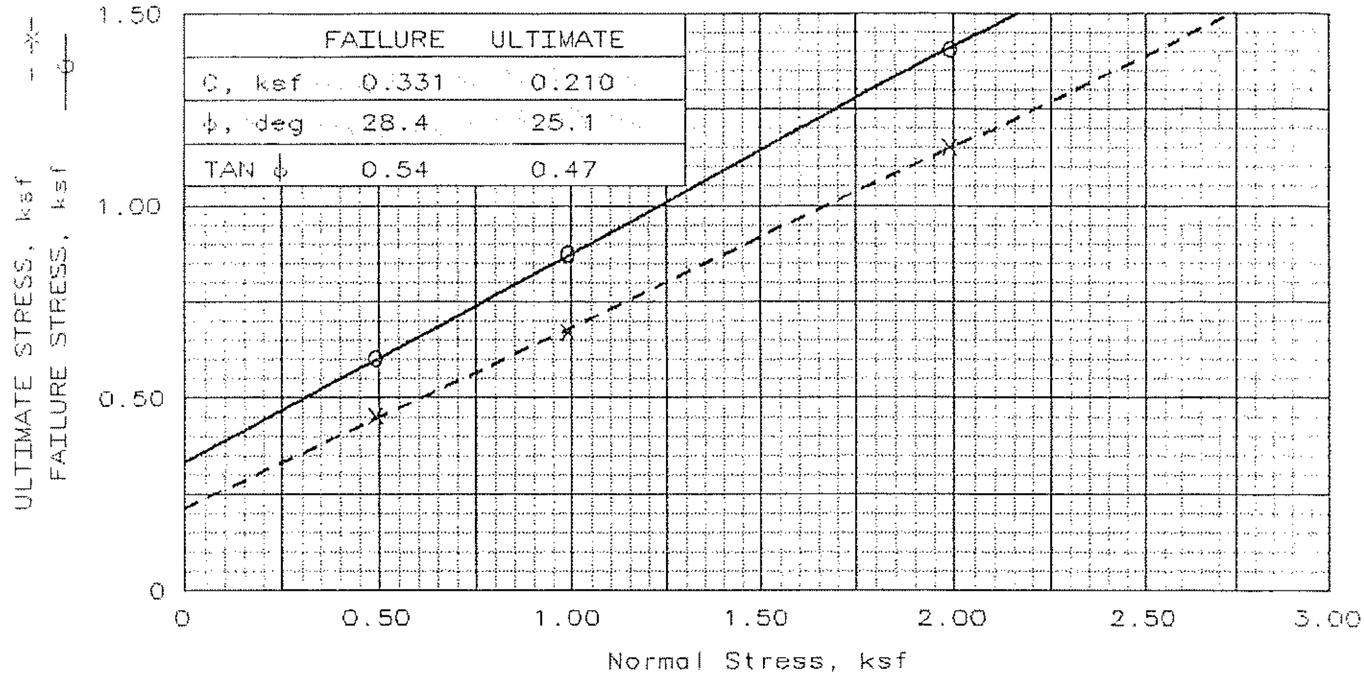
CLIENT:

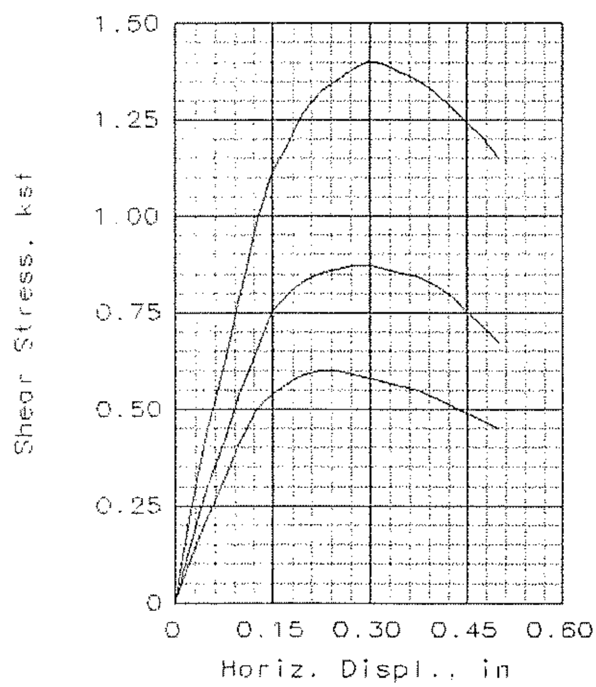
PROJECT: -Deboer

SAMPLE LOCATION: GK-5 @ 5.0 Ft.

PROJ. NO.: 1957 DATE: 10-12-04

DIRECT SHEAR TEST REPORT





		1	2	3
INITIAL	WATER CONTENT, %	11.1	11.1	11.1
	DRY DENSITY, pcf	119.9	119.7	119.9
	SATURATION, %	74.4	74.1	74.3
	VOID RATIO	0.401	0.402	0.401
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	2.000	2.000	2.000
AT TEST	WATER CONTENT, %	14.0	14.2	13.7
	DRY DENSITY, pcf	120.8	121.0	122.4
	SATURATION, %	96.3	98.3	99.1
	VOID RATIO	0.390	0.388	0.372
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	1.985	1.979	1.958
NORMAL STRESS, ksf		0.500	1.000	2.000
FAILURE STRESS, ksf		0.601	0.872	1.403
DISPLACEMENT, in		0.225	0.275	0.300
ULTIMATE STRESS, ksf		0.451	0.671	1.152
DISPLACEMENT, in		0.500	0.500	0.500
Strain rate, in/min		0.0075	0.0075	0.0075

SAMPLE TYPE: Undisturbed
DESCRIPTION: Dark Brown Clayey SAND (SC)

SPECIFIC GRAVITY= 2.69
REMARKS:

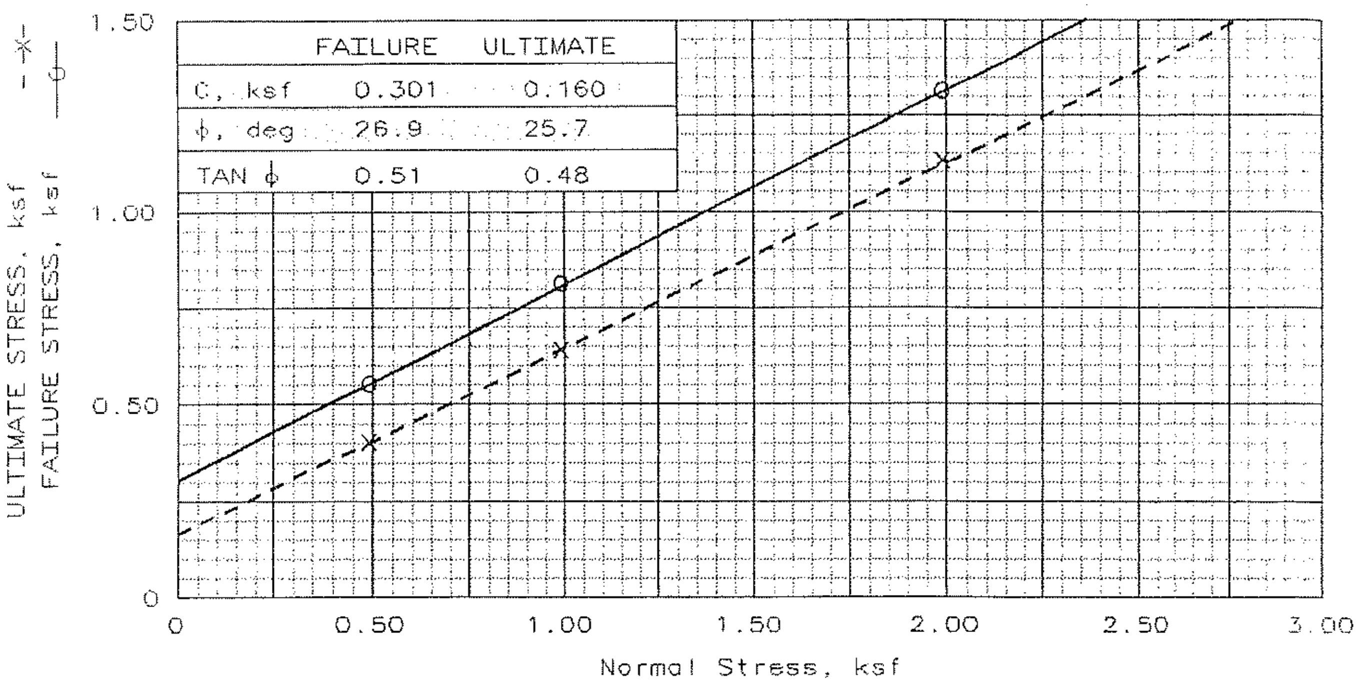
CLIENT:

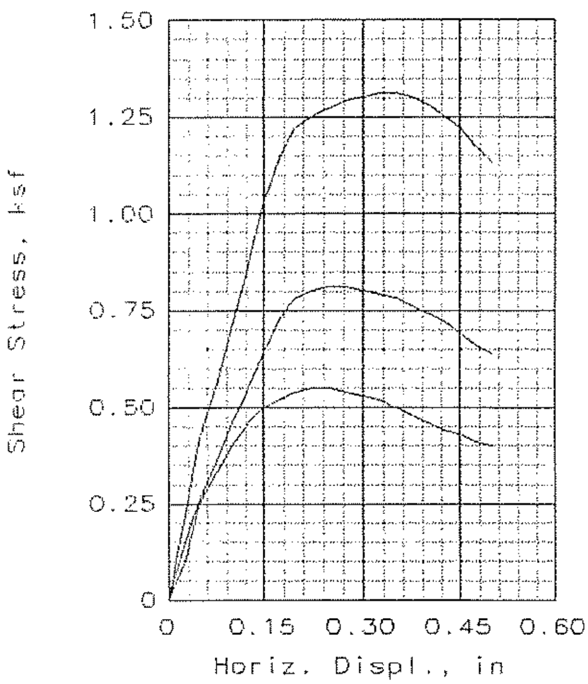
PROJECT: Deboer

SAMPLE LOCATION: GK-3 @ 10.0 Ft.

PROJ. NO.: 1957 DATE: 10-06-04

DIRECT SHEAR TEST REPORT





		1	2	3
INITIAL	WATER CONTENT, %	14.4	14.4	14.4
	DRY DENSITY, pcf	111.7	111.7	111.7
	SATURATION, %	76.7	76.6	76.7
	VOID RATIO	0.508	0.509	0.505
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	2.000	2.000	2.000
AT TEST	WATER CONTENT, %	17.3	18.0	17.1
	DRY DENSITY, pcf	112.6	112.7	113.0
	SATURATION, %	93.9	98.0	94.0
	VOID RATIO	0.497	0.495	0.491
	DIAMETER, in	2.420	2.420	2.420
	HEIGHT, in	1.985	1.982	1.978
	NORMAL STRESS, ksf	0.500	1.000	2.000
	FAILURE STRESS, ksf	0.551	0.811	1.312
	DISPLACEMENT, in	0.225	0.250	0.325
	ULTIMATE STRESS, ksf	0.401	0.641	1.132
	DISPLACEMENT, in	0.500	0.500	0.500
	Strain rate, in/min	0.0075	0.0075	0.0075

SAMPLE TYPE: Undisturbed
DESCRIPTION: Light Brown Silty SAND with Clay (SM/SC)

SPECIFIC GRAVITY= 2.7
REMARKS:

CLIENT:

PROJECT: Deboer

SAMPLE LOCATION: GK-2 @ 5.0 Ft.

PROJ. NO.: 1957 DATE: 10-05-04

DIRECT SHEAR TEST REPORT

ANAHEIM TEST LABORATORY

3008 S. ORANGE AVENUE
SANTA ANA, CALIFORNIA 92707
PHONE (714) 549-7267

GEO KINETICS:
15510 ROCKFIELD BLVD. #C3
IRVINE, CA. 92618

ATTN: GLENN

DATE: 10/05/04

P.O. No. VERBAL

Shipper No.

Lab. No. A-5855-1

Specification:

Material: SOIL

PROJECT: DEBOER

GK-5 @ 0-5'
BULK

ANALYTICAL REPORT

CORROSION SERIES
SUMMARY OF DATA

pH	SOLUBLE SULFATES per cA. 417 ppm	SOLUBLE CHLORIDES per CA. 422 ppm	MIN. RESISTIVITY per CA. 643 ohm-cm
6.8	132	69	730

RESPECTFULLY SUBMITTED

POPPY BRIDGER Chief Chemist

M #2

ANAHEIM TEST LAB.

"R" VALUE CA 301

Client: GEO KINETICS: Job No.: A 5855-2 Date: 10/7/2004

Client Reference No DEBOER Soil Type: Gray, F.M Silty Sand

TEST SPECIMEN		A	B	C	D
Compactor Air Pressure	psi	200	300	250	
Initial Moisture Content	%	10.6	10.6	10.6	
Moisture at Compaction	%	13.4	12.4	12.9	
Briquette Height	in.	2.50	2.54	2.51	
Dry Density	pcf	109.0	111.1	109.7	
EXUDATION PRESSURE	psi	247	630	415	
EXPANSION dial	(x .0001)	2	10	6	
Ph at 1000 pounds	psi	27	19	23	
Ph at 2000 pounds	psi	43	32	38	
Displacement	turns	4.5	4.17	4.3	
"R" Value		60	71	65	
CORRECTED "R" VALUE		60	71	65	

Final "R" Value	
BY EXUDATION: @ 300 psi	62
BY EXPANSION: TI = 5.0	65

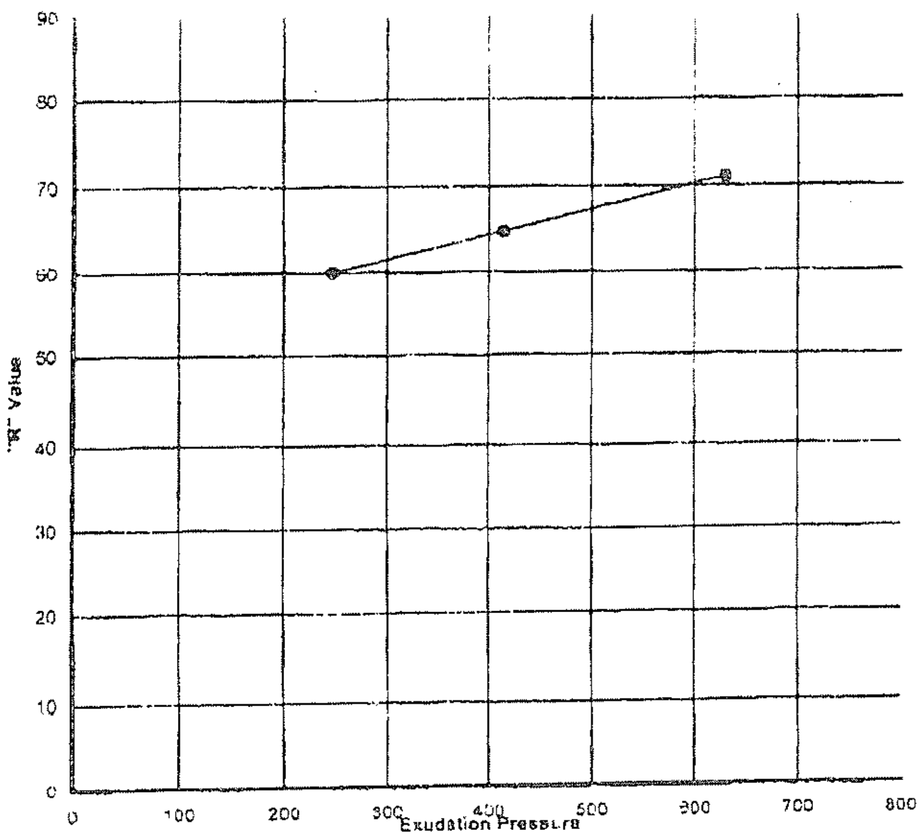


Table 2 - DeBoer Moisture & Organic Soil Testing Results

LOCATION	DEPTH (ft.)	MOISTURE CONTENT %	ORGANIC CONTENT %
HA -1	0-6"	8.4	0.41
	1-1.5'	9.6	0.52
	3-3.5'	13.6	0.23
HA -2	0-6"	8.5	0.55
	1-1.5'	10.8	0.72
	3-3.5'	13.2	0.48
HA -3	0-6"	8.4	0.24
	1-1.5'	8.8	0.24
	3-3.5'	7.0	0.25
HA -4	0-6"	49.8	9.18
	1-1.5'	7.4	0.31
	3-3.5'	12.6	0.75
HA -5	0-6"	9.6	0.14
	1-1.5'	11.5	0.07
	3-3.5'	6.1	0.14
HA -6	0-6"	10.8	0.15
	1-1.5'	6.5	0.15
	3-3.5'	7.9	0.15
HA -7	0-6"	9.4	0.34
	1-1.5'	7.3	0.48
	3-3.5'	10.9	0.64
HA -8	0-6"	7.7	0.53
	1-1.5'	11.6	0.06
	3-3.5'	13.2	0.30
HA -9	0-6"	6.5	0.30
	1-1.5'	7.9	0.28
	3-3.5'	11.3	0.12
HA -10	0-6"	5.4	0.33
	1-1.5'	7.8	0.41
	3-3.5'	12.1	0.04
HA -11	0-6"	5.7	0.21
	1-1.5'	8.4	0.74
	3-3.5'	10.5	0.96
HA -12	0-6"	5.8	0.43
	1-1.5'	4.7	0.07
	3-3.5'	5.7	0.10
HA -13	0-6"	7.9	0.09
	1-1.5'	5.0	0.16
	3-3.5'	4.3	0.16
HA -14	0-6"	15.9	0.28
	1-1.5'	15.6	0.08
	3-3.5'	12.5	0.05
HA -15	0-6"	8.8	0.23
	1-1.5'	9.2	0.11
	3-3.5'	8.4	0.12

Table 2 - DeBoer Moisture & Organic Soil Testing Results

LOCATION	DEPTH (ft.)	MOISTURE CONTENT %	ORGANIC CONTENT %
HA -16	0-6"	9.8	0.13
	1-1.5'	10.5	0.92
	3-3.5'	9.1	0.61
HA -17	0-6"	11.6	0.29
	1-1.5'	16.3	0.41
	3-3.5'	8.2	0.39
HA -18	0-6"	3.6	0.06
	1-1.5'	12.3	0.14
	3-3.5'	18.9	0.84
HA -19	0-6"	3.9	0.41
	1-1.5'	58.1	11.79
	3-3.5'	18.2	0.29
HA -20	0-6"	12.2	0.24
	1-1.5'	20.4	0.13
	3-3.5'	6.2	0.20
HA -21	0-6"	5.1	0.30
	1-1.5'	5.3	0.21
	3-3.5'	7.8	0.25
HA -22	0-6"	3.3	0.13
	1-1.5'	8.7	0.28
	3-3.5'	13.7	0.26
HA -23	0-6"	4.7	0.07
	1-1.5'	7.2	0.22
	3-3.5'	7.8	0.12
HA -24	0-6"	13.8	0.39
	1-1.5'	12.7	0.17
	3-3.5'	6.8	0.29
HA -25	0-6"	24.5	0.78
	1-1.5'	25.0	0.53
	3-3.5'	17.7	0.56
HA -26	0-6"	15.1	0.56
	1-1.5'	9.4	0.39
	3-3.5'	9.5	0.05
HA -27	0-6"	38.4	5.18
	1-1.5'	14.7	0.57
	3-3.5'	36.9	0.17
HA -28	0-6"	7.9	0.24
	1-1.5'	8.6	0.30
	3-3.5'	9.1	0.11
HA -29	0-6"	9.7	0.24
	1-1.5'	10.1	0.20
	3-3.5'	11.4	0.41
HA -30	0-6"	10.2	0.79
	1-1.5'	7.3	0.39
	3-3.5'	6.9	0.25

Table 2 - DeBoer Moisture & Organic Soil Testing Results

LOCATION	DEPTH (ft.)	MOISTURE CONTENT %	ORGANIC CONTENT %
HA -31	0-6"	5.0	0.05
	1-1.5'	4.7	0.23
	3-3.5'	6.6	0.32
HA -32	0-6"	8.2	0.43
	1-1.5'	5.0	0.24
	3-3.5'	6.7	0.13
HA -33	0-6"	15.2	1.68
	1-1.5'	6.4	0.10
	3-3.5'	8.8	0.07
HA -34	0-6"	4.3	0.26
	1-1.5'	5.3	0.19
	3-3.5'	6.2	0.18
HA -35	0-6"	7.2	0.53
	1-1.5'	6.8	0.44
	3-3.5'	-18.7	0.44
HA -36	0-6"	7.0	0.12
	1-1.5'	10.4	0.10
	3-3.5'	18.2	0.08
HA -37	0-6"	12.3	0.68
	1-1.5'	7.0	0.09
	3-3.5'	3.1	0.05
HA -38	0-6"	5.0	0.29
	1-1.5'	6.0	0.10
	3-3.5'	3.3	0.19
HA -39	0-6"	4.6	0.10
	1-1.5'	6.1	0.17
	3-3.5'	8.0	0.09
HA -40	0-6"	7.0	0.21
	1-1.5'	7.1	0.72
	3-3.5'	7.6	0.13
HA -41	0-6"	6.4	0.27
	1-1.5'	6.3	0.07
	3-3.5'	3.2	0.06
HA -42	0-6"	9.6	0.17
	1-1.5'	12.5	0.20
	3-3.5'	7.7	0.37
HA -43	0-6"	8.5	0.17
	1-1.5'	6.3	0.29
	3-3.5'	5.2	0.27
HA -44	0-6"	7.6	0.11
	1-1.5'	7.6	0.23
	3-3.5'	7.7	0.25
HA -45	0-6"	4.5	0.15
	1-1.5'	6.3	0.14
	3-3.5'	9.1	0.04

Table 2 - DeBoer Moisture & Organic Soil Testing Results

LOCATION	DEPTH (ft.)	MOISTURE CONTENT %	ORGANIC CONTENT %
HA -46	0-6"	6.5	0.21
	1-1.5'	8.0	0.08
	3-3.5'	8.7	0.20
HA -47	0-6"	13.6	0.83
	1-1.5'	20.4	0.51
	3-3.5'	6.3	0.29
HA -48	0-6"	7.4	0.19
	1-1.5'	6.1	0.14
	3-3.5'	16.3	0.06
HA -49	0-6"	3.0	0.09
	1-1.5'	4.3	0.19
	3-3.5'	4.7	0.17
HA -50	0-6"	7.2	0.28
	1-1.5'	12.5	0.15
	3-3.5'	10.2	0.24

APPENDIX D

Earthwork Specifications

ALTA CALIFORNIA GEOTECHNICAL, INC.
EARTHWORK SPECIFICATIONS

These specifications present the generally accepted standards and minimum earthwork requirements for the development of the project. These specifications shall be the project guidelines for earthwork except where specifically superceded in preliminary geology and soils reports, grading plan review reports or by the prevailing grading codes or ordinances of the controlling agency.

A. GENERAL

1. The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications.

2. The project Geotechnical Engineer and Engineering Geologist, or their representatives, shall provide observation and testing services, and Geotechnical consultation for the duration of the project.

3. All clearing, grubbing, stripping and site preparation for the project shall be accomplished by the Contractor to the satisfaction of the Geotechnical Engineer/Engineering Geologist.

4. It is the Contractor's responsibility to prepare the ground surface to receive fill to the satisfaction of the Geotechnical Engineer and to place, spread, mix, moisture condition, and compact the fill in accordance with the job specifications and as required by the Geotechnical Engineer. The Contractor shall also remove all material considered by the Geotechnical Engineer to be unsuitable for use in the construction of engineered fills.

5. The Contractor shall have suitable and sufficient equipment in operation to handle the amount of fill being placed. When necessary, equipment will be shut down temporarily in order to permit the proper preparation of fills.

B. PREPARATION OF FILL AREAS

1. Excessive vegetation and all deleterious material should be disposed of offsite as required by the Geotechnical Engineer.

   Existing fill, soil, alluvium or rock materials determined by the Geotechnical Engineer as being unsuitable for placement in compacted fills shall be removed and hauled from the site. Where applicable, the Contractor may obtain the approval of the Soils Engineer and the controlling authorities for the project to dispose of the above described materials, or a portion thereof, in designated areas onsite.

After removal of the deleterious materials have been accomplished, earth materials deemed unsuitable in their natural, in-place condition, shall be removed as recommended by the Geotechnical Engineer/Engineering Geologist.

2. Upon achieving a suitable bottom for fill placement, the exposed removal bottom shall be disced or bladed by the Contractor to the satisfaction of the Geotechnical Engineer. The prepared ground surfaces shall then be brought to the specified moisture content mixed as required, and compacted and tested as specified. In localities where it is necessary to obtain the approval of the controlling agency prior to placing fill, it will be the Contractor's responsibility to contact the proper authorities to visit the site.

3. Any underground structure such as cesspools, cisterns, mining shafts, tunnels, septic tanks, wells, pipelines or other structures not located prior to grading are to be removed or treated in a manner prescribed by the Geotechnical Engineer and/or the controlling agency for the project.

C. ENGINEERED FILLS

1. Any material imported or excavated on the property may be utilized as fill, provided the material has been determined to be suitable by the Geotechnical Engineer. Deleterious materials shall be removed from the fill as directed by the Geotechnical Engineer.

2. Rock or rock fragments less than twelve inches in the largest dimension may be utilized in the fill, provided they are not placed in concentrated pockets and the distribution of the rocks is approved by the Geotechnical Engineer.

3. Rocks greater than twelve inches in the largest dimension shall be taken offsite, or placed in accordance with the recommendations of the Geotechnical Engineer in areas designated as suitable for rock disposal.

4. All materials to be used as fill, shall be tested in the laboratory by the Geotechnical Engineer. Proposed import materials shall be approved by the Geotechnical Engineer 48 hours prior to importation.

5. The fill materials shall be placed by the Contractor in lifts, that when compacted, shall not exceed six inches. Each lift shall be spread evenly and shall be

thoroughly mixed to achieve a near uniform moisture condition and a uniform blend of materials.

All compaction shall be achieved at or above the optimum moisture content, as determined by the applicable laboratory standard. The Contractor will be notified if the fill materials are too wet or too dry to achieve the required compaction standard.

6. When the moisture content of the fill material is below the limit specified by the Geotechnical Engineer, water shall be added and the materials shall be blended until a uniform moisture content, within specified limits, is achieved. When the moisture content of the fill material is above the limits specified by the Geotechnical Engineer, the fill materials shall be aerated by discing, blading, mixed with dryer fill materials, or other satisfactory methods until the moisture content is within the specified limits.

7. Each fill lift shall be compacted to the minimum project standards, in compliance with the testing methods specified by the controlling governmental agency, and in accordance with recommendations of the Geotechnical Engineer.

   In the absence of specific recommendations by the Geotechnical Engineer to the contrary, the compaction standard shall be the most recent version of ASTM:D 1557.

8. Where a slope receiving fill exceeds a ratio of five-horizontal to one-vertical, the fill shall be keyed and benched through all unsuitable materials into sound bedrock or firm material, in accordance with the recommendations and approval of the Geotechnical Engineer.

9. Side hill fills shall have a minimum key width of 15 feet into bedrock or firm materials, unless otherwise specified in the soil report and approved by the Geotechnical Engineer in the field.

10. Drainage terraces and subdrainage devices shall be constructed in compliance with the ordinances of the controlling governmental agency and/or with the recommendations of the Geotechnical Engineer and Engineering Geologist.

11. The Contractor shall be required to maintain the specified minimum relative compaction out to the finish slope face of fill slopes, buttresses, and stabilization fills as directed by the Geotechnical Engineer and/or the governing agency for the project. This may be achieved by either overbuilding the slope and cutting

back to the compacted core; by direct compaction of the slope face with suitable equipment; or by any other procedure which produces the required result.

12. The fill portion of fill-over-cut slopes shall be properly keyed into rock or firm material; and the fill area shall be stripped of all soil or unsuitable materials prior to placing fill.

    The design cut portion of the slope should be made first and evaluated for suitability by the Engineering Geologist prior to placement of fill in the keyway above the cut slope.

13. Pad areas in cut or natural ground shall be approved by the Geotechnical Engineer. Finished surfaces of these pads may require scarification and recompaction, or over excavation as determined by the Geotechnical Engineer.

D. **CUT SLOPES**

1. The Engineering Geologist shall observe all cut slopes and shall be notified by the Contractor when cut slopes are to be started.

2. If, during the course of grading, unforeseen adverse or potentially adverse geologic conditions are encountered, the Engineering Geologist and Soil Engineer shall investigate, analyze and make recommendations to remediate these problems.

3. Non-erodible interceptor swales shall be placed at the top of cut slopes that face the same direction as the superjacent, prevailing drainage.

4. Unless otherwise specified in specific geotechnical reports, no cut slopes shall be excavated higher or steeper than that allowed by the ordinances of controlling governmental agencies.

5. Drainage terraces shall be constructed in compliance with the ordinances of the controlling governmental agencies, and/or in accordance with the recommendations of the Geotechnical Engineer or Engineering Geologist.

E. **GRADING CONTROL**

1. Fill placement shall be observed and tested by the Geotechnical Engineer and/or his representative during grading.

   Field density tests shall be made by the Geotechnical Engineer and/or his representative to evaluate the compaction and moisture compliance of each fill lift. Density tests shall be conducted at intervals not to exceed two feet of fill height. Where sheepsfoot rollers are used, the fill may be disturbed to a depth of several inches. Density determinations shall be taken in the compacted material below the disturbed surface at a depth determined by the Geotechnical Engineer or his representative.

2. Where tests indicate that the density of any layer of fill, or portion thereof, is below the required relative compaction, or improper moisture content is in evidence, that particular layer or portion thereof shall be reworked until the required density and/or moisture content has been attained. Additional fills shall not be placed over an area until the previous lift of fill has been tested and found to meet the density and moisture requirements for the project and the previous lift is approved by the Geotechnical Engineer.

3. When grading activities are interrupted by heavy rains, fill operations shall not be resumed until field observations and tests by the Geotechnical Engineer indicate the moisture content and density of the fill are within the specified limits.

4. During construction, the Contractor shall properly grade all surfaces to maintain good drainage and prevent the ponding of water. The Contractor shall take remedial action to control surface water and to prevent erosion of graded areas until such time as a permanent drainage and erosion devices have been installed.

5. Observation and testing by the Geotechnical Engineer and/or his representative shall be conducted during filling and compacting operations in order that he will be able to state in his opinion that all cut and filled areas are graded in accordance with the approved specifications.

6. Upon the completion of grading activities and after the Geotechnical Engineer and Engineering Geologist have finished their observations of the work, final reports shall be submitted. No further excavation or fill placement shall be undertaken without prior notification of the Geotechnical Engineer and/or Engineering Geologist.

F. <u>FINISHED SLOPES</u>

All finished cut and fill slopes shall be planted and irrigated and/or protected from erosion in accordance with the project specifications, governing agencies, and/or as recommended by a landscape architect.

APPENDIX E

Grading Details

DETAIL FOR FILL SLOPE TOEING OUT ON FLAT ALLUVIATED CANYON

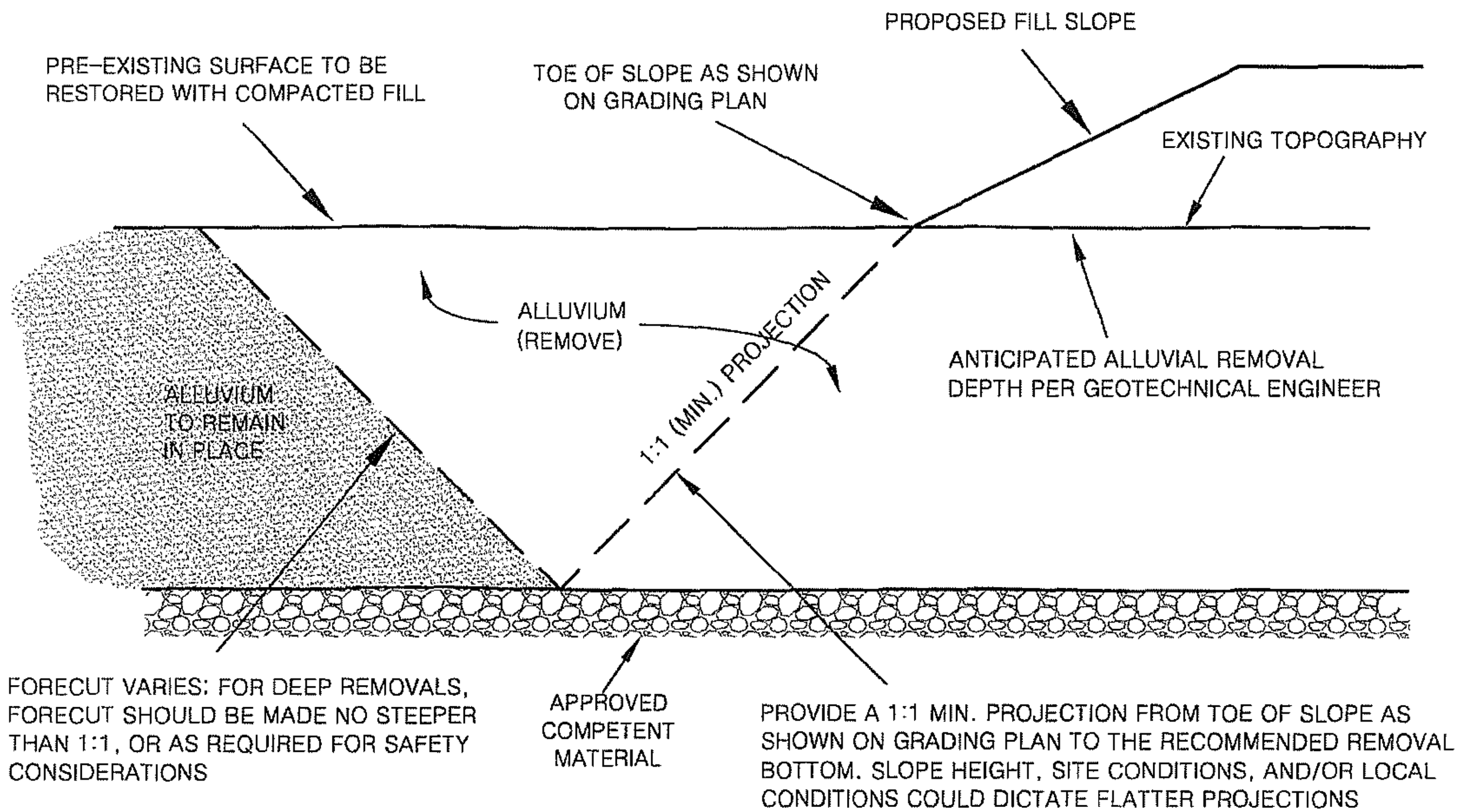


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PLATE G-1

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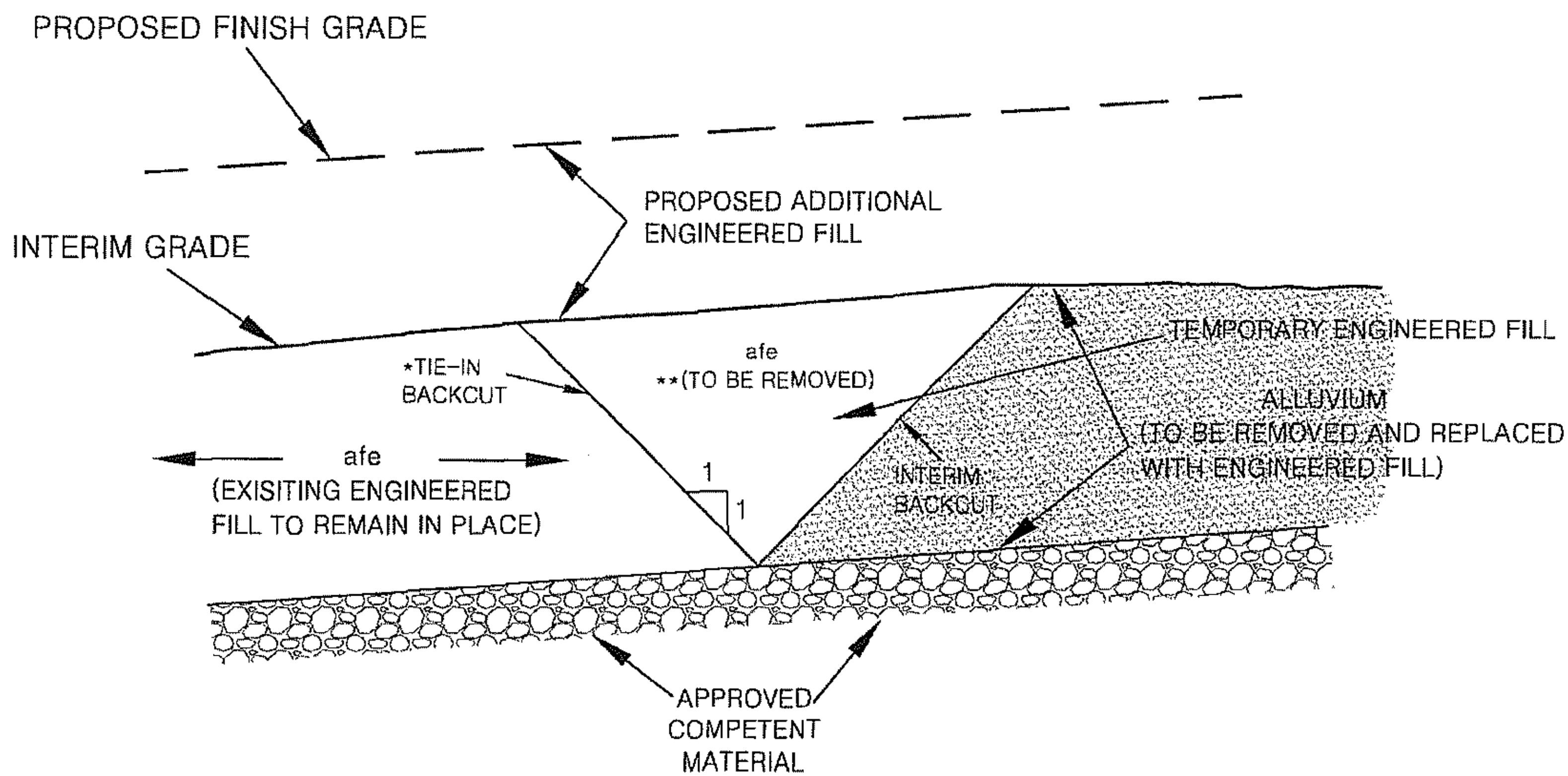
REMOVAL ADJACENT TO EXISTING FILL



*INITIATE 1:1 TIE-IN BACKCUT TO INTERCEPT TOE OF INTERIM BACKCUT

**AS PART OF TIE-IN FOR ADDITIONAL ENGINEERED FILL

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PLATE G-2

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CANYON SUBDRAIN

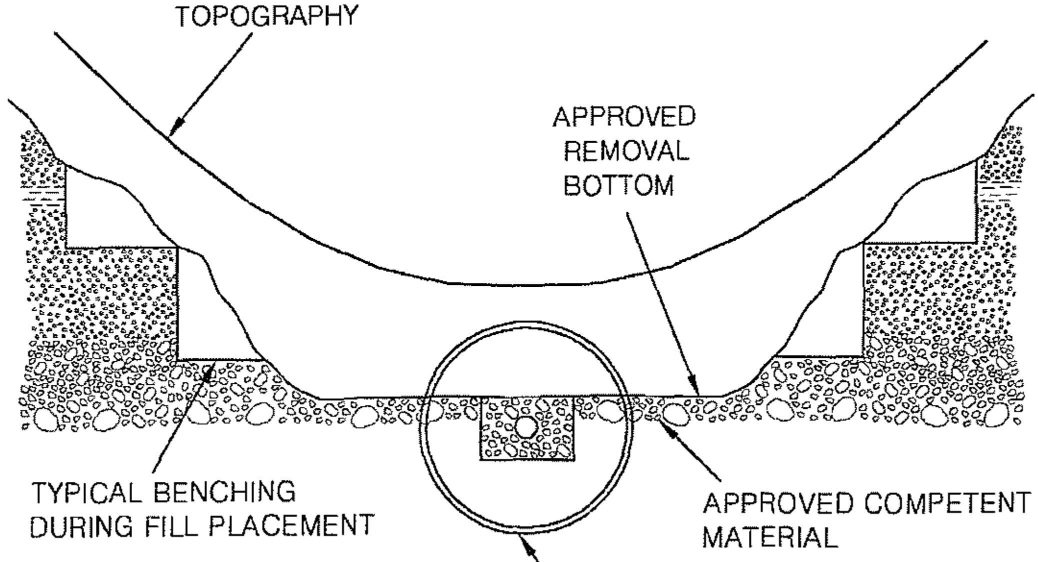

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PLATE G-3

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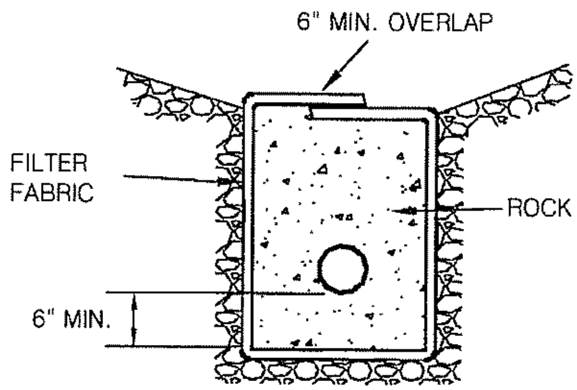
CANYON SUBDRAIN DETAIL



PERFORATED PIPE SURROUNDED WITH ROCK AND FILTER FABRIC

ROCK: MIN. VOLUME OF 9 CU.FT. PER LINEAR FT. OF 3/4 IN. MAX. ROCK
PIPE: 6 IN. ABS OR PVC PIPE WITH A MINIMUM OF 8 PERFORATIONS (1/4-IN. DIA.) PER LINEAL FT. IN BOTTOM HALF OF PIPE ASTM D2751, SDR 35, OR ASTM D3034 OR ASTM D1527, SCHD. 40 ASTM D1785, SCHD. 40
FILTER FABRIC: MIRAFI 140 FILTER FABRIC OR APPROVED EQUIVALENT

NOTE: FOR CONTINUOUS RUN IN EXCESS OF 500. FT USE 8 IN. DIA. PIPE

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PLATE G-4

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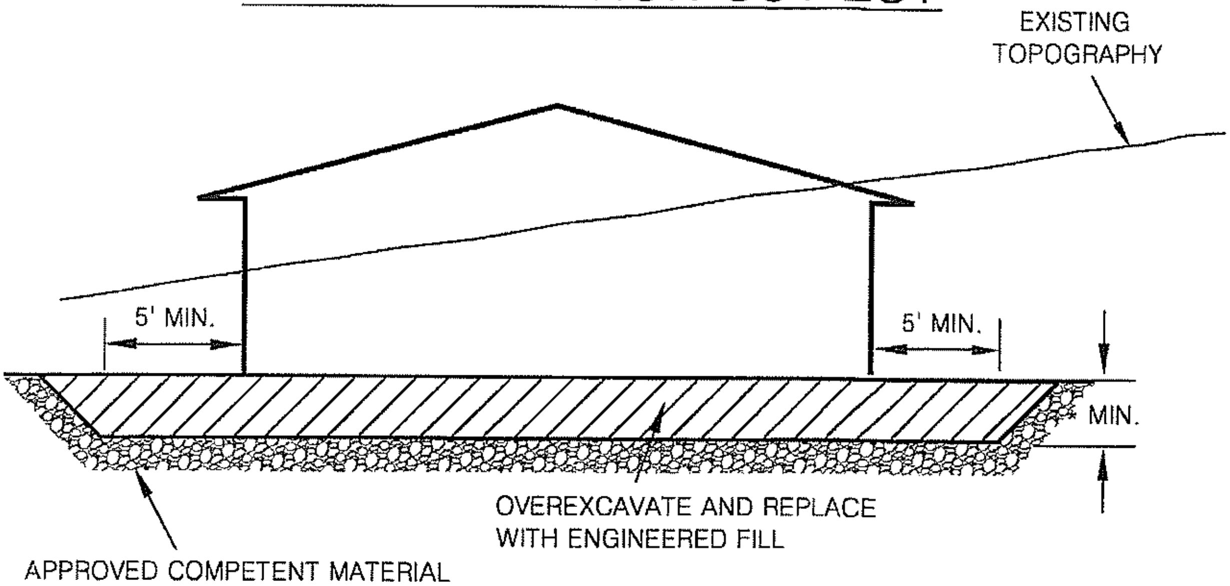
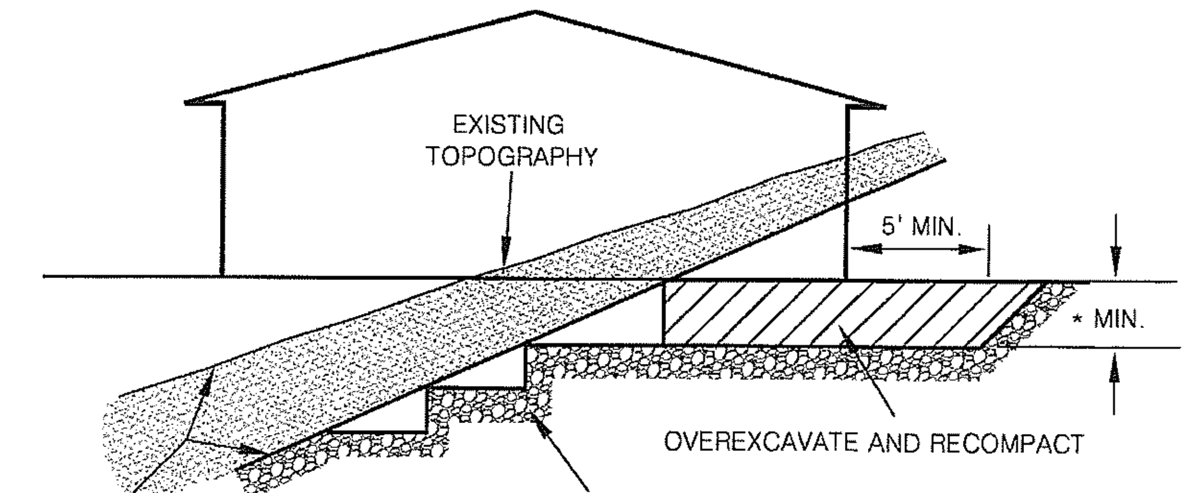
OVEREXCAVATION CUT LOT



CUT-FILL LOT (TRANSITION)



*NOTE ALL BUILDING PADS SHALL BE OVER EXCAVATED TO A MINIMUM OF ⅓ OF THE MAXIMUM DEPTH OF FILL BELOW THE BUILDING PAD TO A MAXIMUM OF 17 FEET (SEE PLATE G-16)

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PLATE G-5

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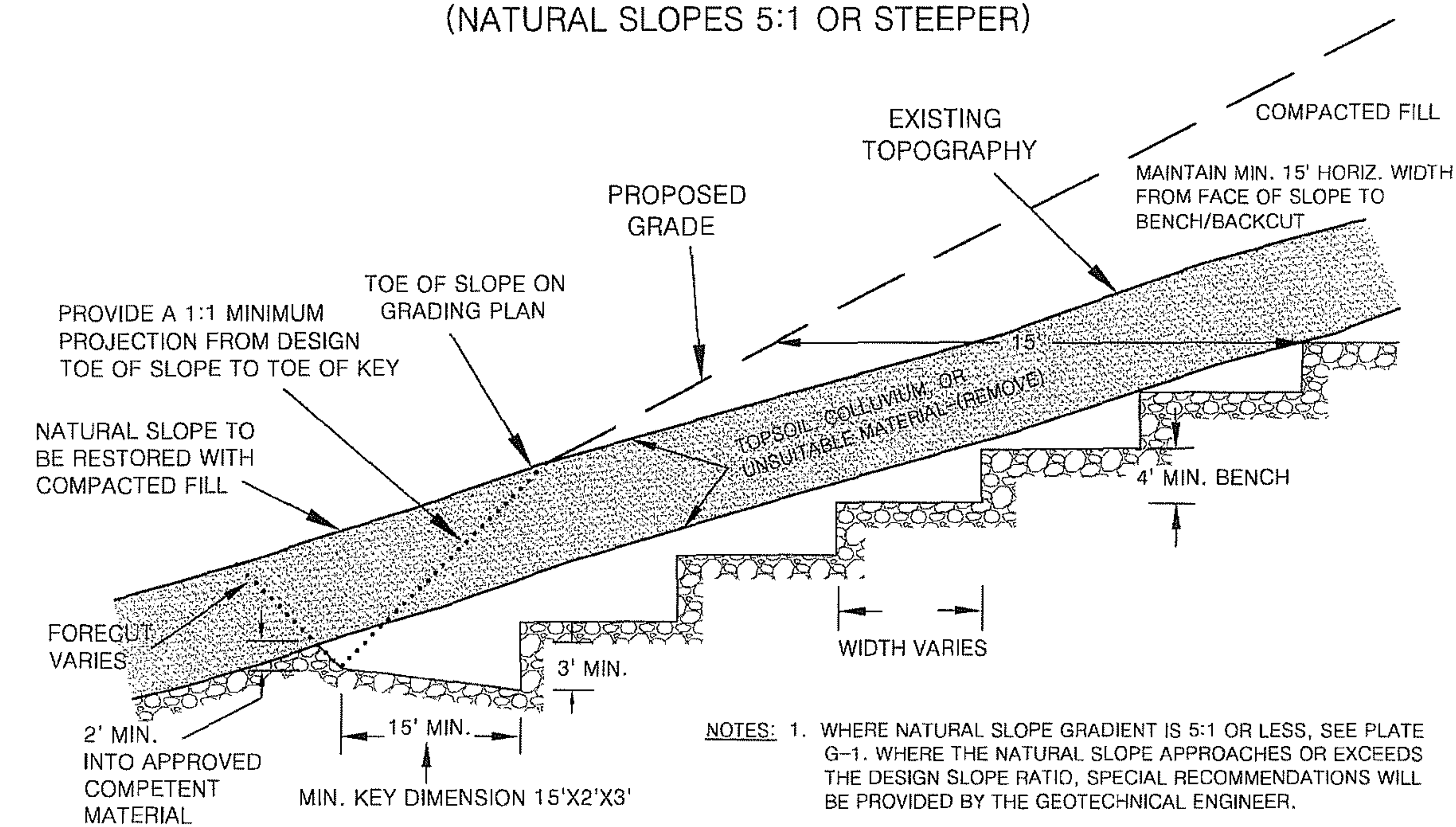
SIDE HILL SLOPE FILL DETAIL

(NATURAL SLOPES 5:1 OR STEEPER)



NOTES: 1. WHERE NATURAL SLOPE GRADIENT IS 5:1 OR LESS, SEE PLATE G-1. WHERE THE NATURAL SLOPE APPROACHES OR EXCEEDS THE DESIGN SLOPE RATIO, SPECIAL RECOMMENDATIONS WILL BE PROVIDED BY THE GEOTECHNICAL ENGINEER.

2. THE NEED FOR AND PLACEMENT OF DRAINS WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER OR GEOLOGIST BASED UPON EXPOSED FIELD CONDITIONS.

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PLATE G-6

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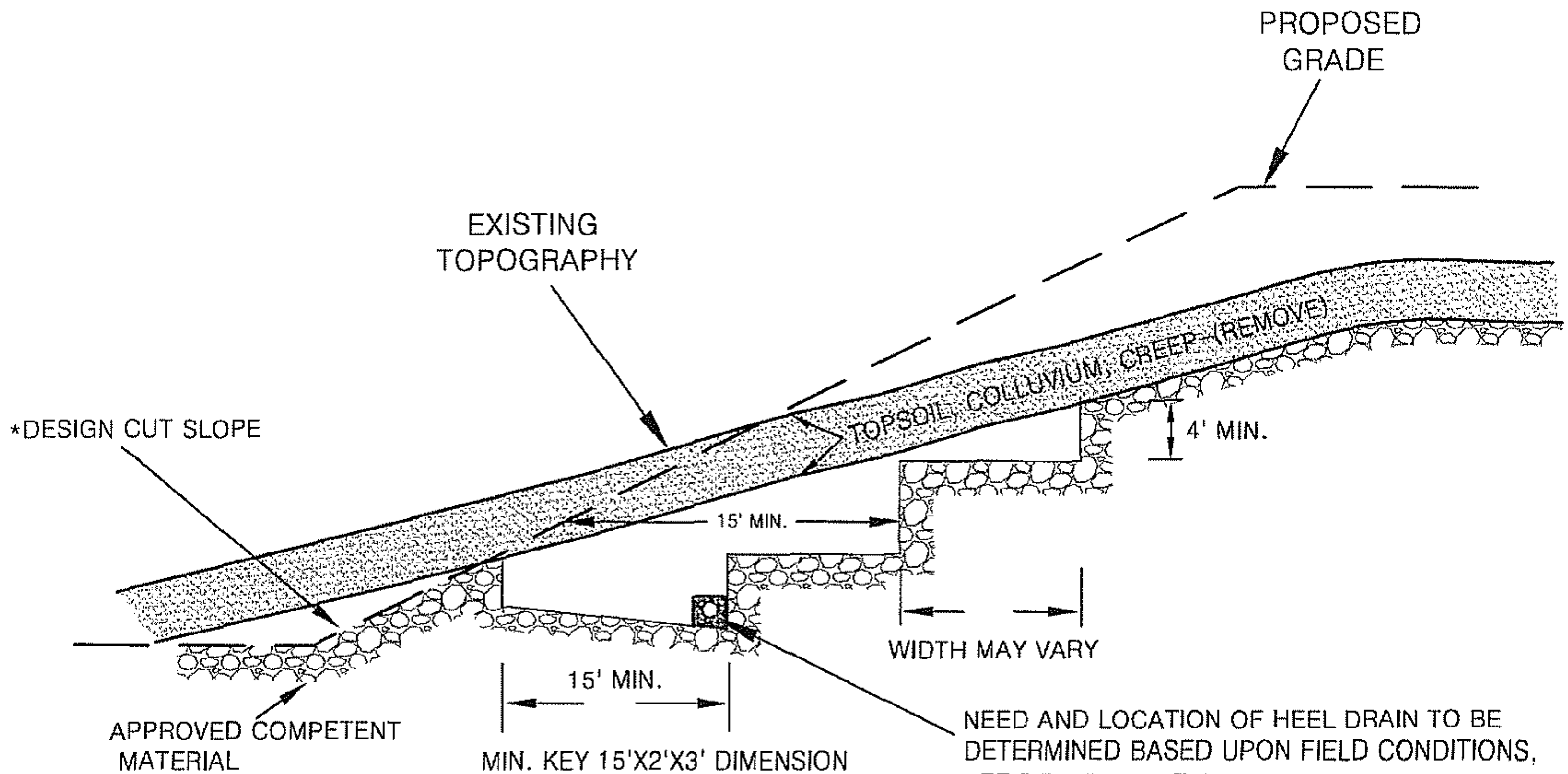
FILL OVER CUT SLOPE DETAIL



*THE CUT PORTION OF THE SLOPE SHOULD BE EXCAVATED AND EVALUATED BY THE ENGINEERING GEOLOGIST/GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTING THE FILL SLOPE

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PLATE G-7

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STABILIZATION/BUTTRESS FILL BACKDRAIN

NOTE:

1. ASTM D2751, SDR 35, OR ASTM D3034 OR ASTM D1527, SCHD. 40 ASTM D1785, SCHD. 40
2. SOLID PIPE OUTLETS TO BE PROVIDED EVERY 100 FT. AND JOINED TO PERFORATED BACKDRAIN PIPE WITH "L" OR "T"s. MIN. 2% GRADIENT.
3. GRAVEL TRENCH TO BE FILLED WITH 3/4 IN. MAXIMUM ROCK
4. THE NECESSITY FOR UPPER TIER BACKDRAINS SHALL BE DETERMINED IN THE FIELD BY THE GEOTECHNICAL ENGINEER OR GEOLOGIST. UPPER TIER OUTLETS SHOULD DRAIN INTO PAVED TERRACE DRAINS.

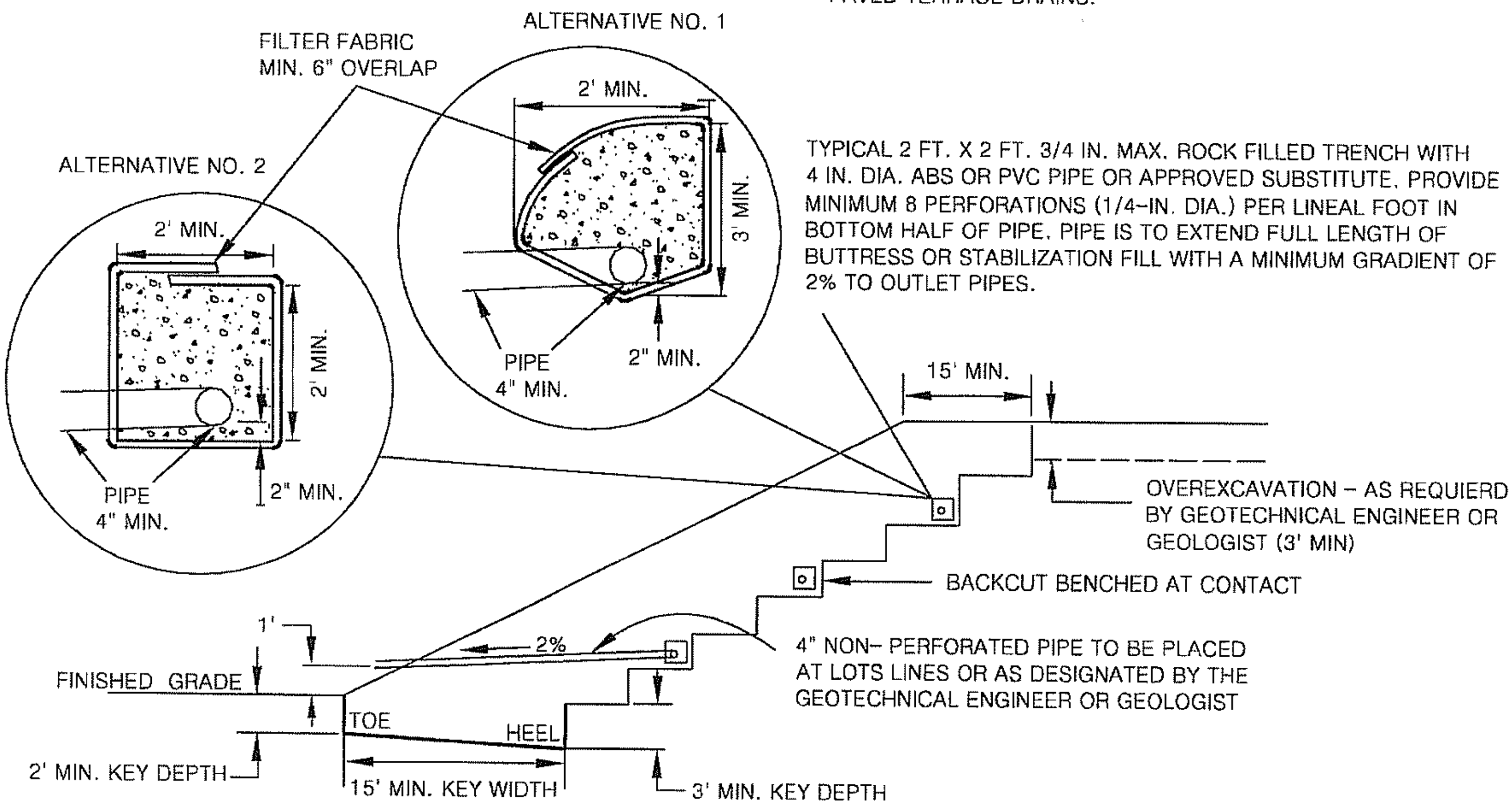

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PLATE G-8

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STABILIZATION FILL
(UPSLOPE ALLUVIATED AREA)

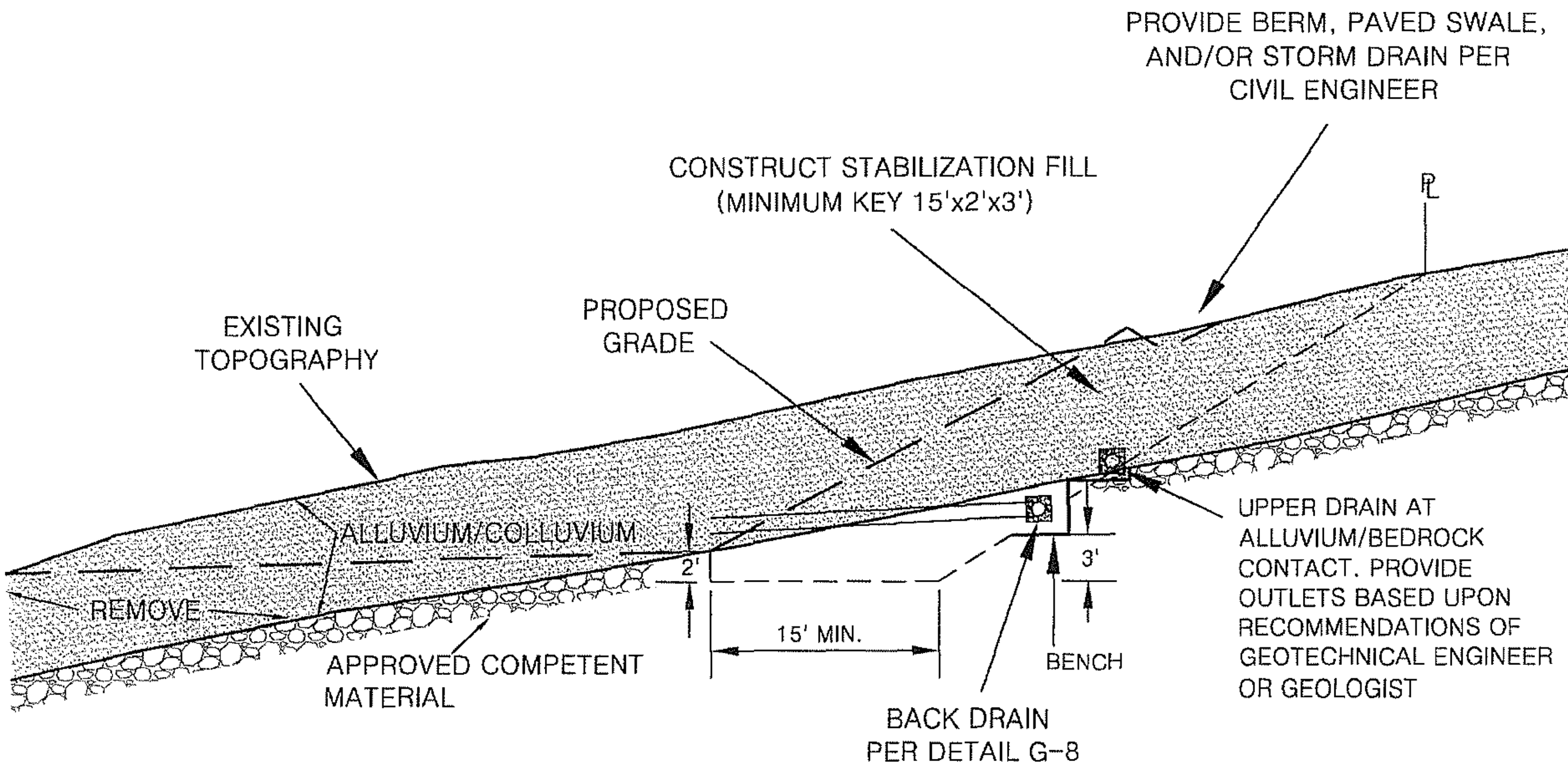

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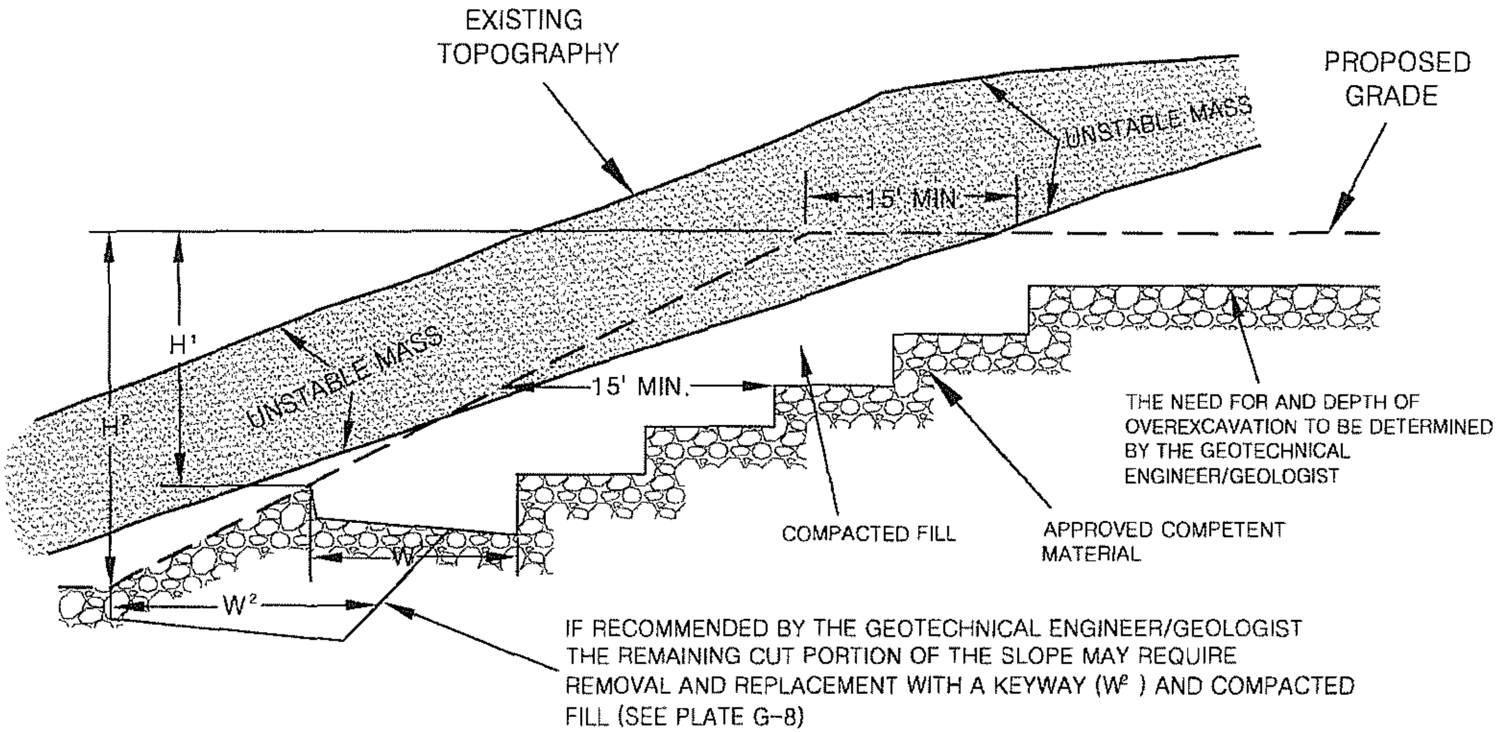
PLATE G-9

SELECTIVE GRADING DETAIL FOR STABILIZATION FILL
UNSTABLE MATERIAL EXPOSED IN PORTION OF CUT SLOPE



NOTES: 1. BACKDRAINS ARE NOT REQUIRED UNLESS SPECIFIED.

2. "W" SHALL BE EQUIPMENT WIDTH (15') FOR SLOPE HEIGHT LESS THAN 25 FEET. FOR SLOPES GREATER THAN 25 FEET, "W" SHALL BE DETERMINED BY THE PROJECT GEOTECHNICAL ENGINEER/GEOLOGIST. AT NO TIME SHALL "W" BE LESS THAN H/2.

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VER. 3/12

PLATE G-10

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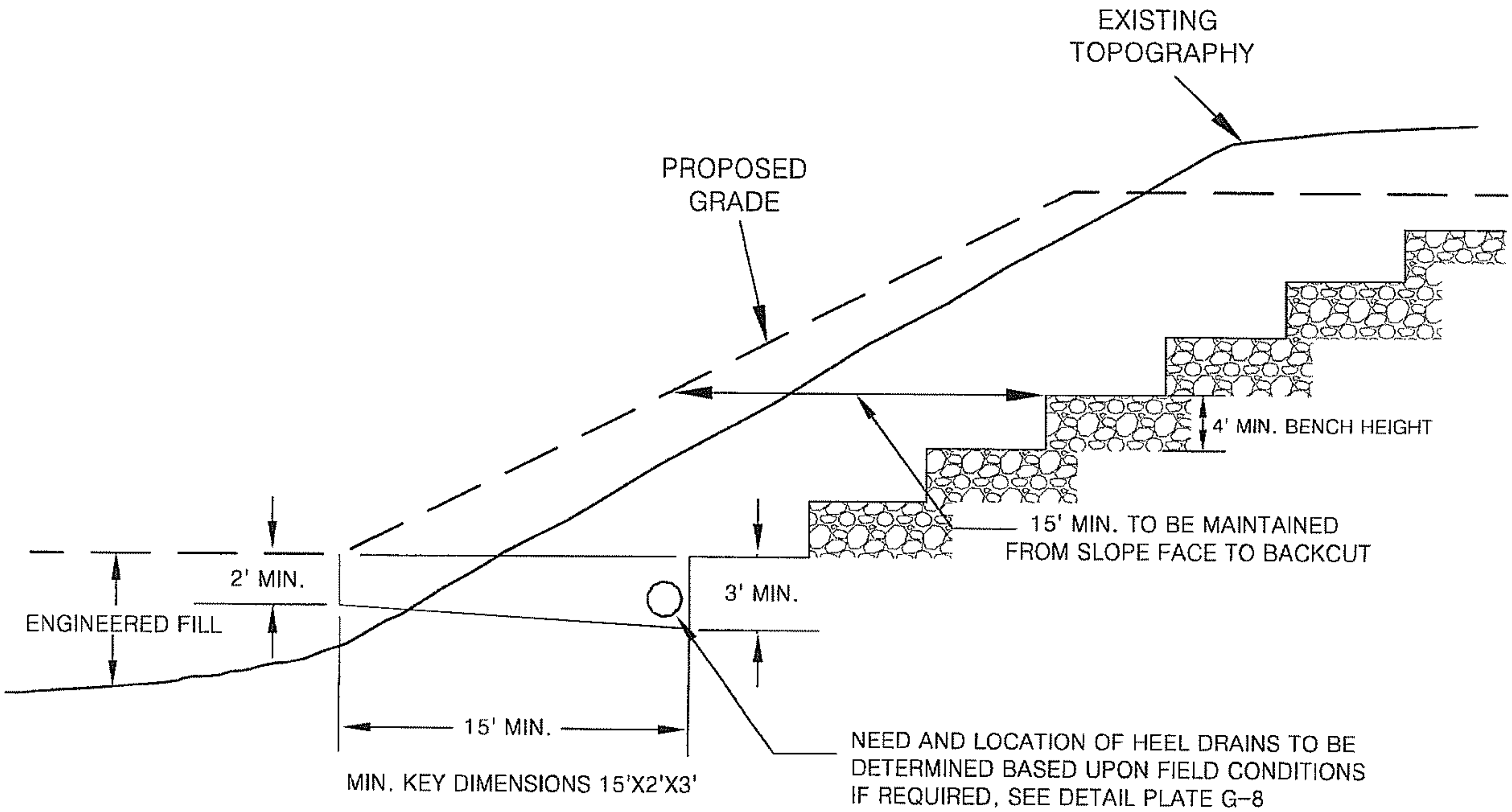
SKIN FILL SLOPE OVER NATURAL GROUND



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VER. 3/12

PLATE G-11

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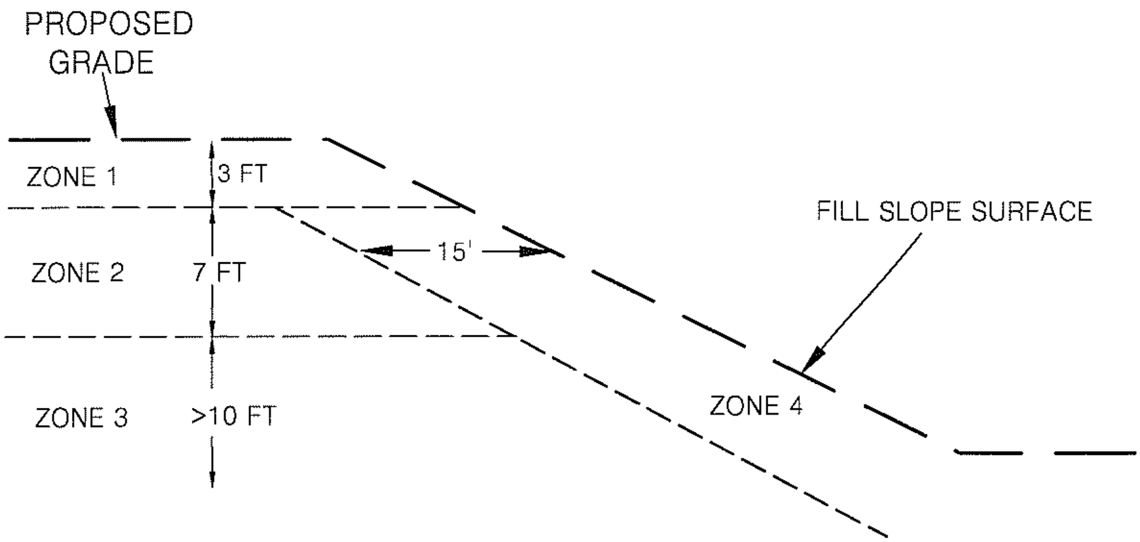
DETAIL FOR MAXIMUM PARTICLE DIMENSION



ZONE	DEPTH	PARTICLE MAX. DIMENSION	PLACEMENT METHOD
1	0-3 ft.	≤0.5 ft.	STANDARD OR CONVENTIONAL COMPACTION METHODS (SEE EARTHWORK SPECIFICATIONS)
2	3-10 ft.	≤2.0 ft.	ROCK BLANKETS (SEE PLATE G-13)
3	>10 ft.	≤8.0 ft.	ROCK BLANKETS (PLATE G-13) ROCK WINDROW (PLATE G-14) INDIVIDUAL ROCK BURIED (PLATE G-15)
4	15 HORIZONTAL FEET FROM FILL SLOPE FACE	≤1.0 ft.	STANDARD OR CONVENTIONAL COMPACTION METHODS (SEE EARTHWORK SPECIFICATIONS)

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VER. 2/15

PLATE G-12

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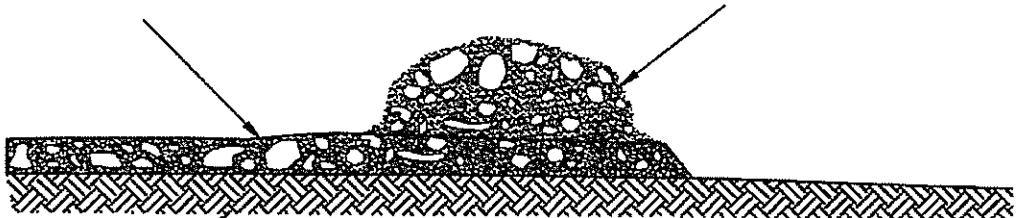
ROCK BLANKET DETAILS

LOOSE PILE 1
LOOSE, DUMPED ROCK, GRAVEL AND SAND MIXTURE REMOVE FRAGMENTS LARGER THAT 2 FEET FOR ISOLATED BURIAL (PLATE G-15) OR WINDROW (PLATE G-10)

APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

COMPACT PILE 1
SPREAD LOOSE PILE FORWARD WITH HEAVY TRACKED DOZER (D-8 OR LARGER). HEAVILY WATER, TRACK, AND APPLY ADDITIONAL SAND AND GRAVEL AS NECESSARY TO FILL VOIDS AND CREATE A DENSE MATRIX OF ROCK, COBBLES, GRAVEL AND SAND (2 FOOT MAXIMUM THICKNESS)

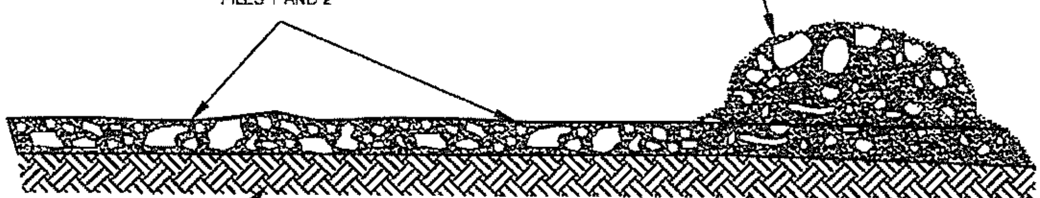
LOOSE PILE 2
DUMP SUCCESSIVE PILES OF LOOSE ROCK, GRAVEL AND SAND MIXTURE ON FORWARD EDGE OF PREVIOUSLY COMPACTED LIFT WITH TRUCKS AND/OR SCRAPERS. USE PREVIOUS LIFT TO ACCESS AND FURTHER COMPACT PILE 1.



APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

LOOSE PILE 3
DUMP SUCCESSIVE PILES OF LOOSE ROCK, GRAVEL AND SAND MIXTURE ON FORWARD EDGE OF PREVIOUSLY COMPACTED LIFT WITH TRUCKS AND/OR SCRAPERS. USE PREVIOUS LIFT TO ACCESS AND FURTHER COMPACT EXISTING BLANKET.

COMPACTED PILES 1 AND 2



APPROVED BOTTOM, OR TOP OF PREVIOUSLY APPROVED BLANKET FILL

OBSERVATION TESTING AND APPROVAL PROCEDURES
OBSERVE EQUIPMENT. SCRAPERS AND TRUCKS SHOULD BE FULLY SUPPORTED ON BLANKET WITHOUT SIGNIFICANT YIELDING. EXCAVATE TEST/OBSERVATION PITS TO CONFIRM EXISTENCE OF MIXTURE OF VARIOUS PARTICLE SIZES, WITHOUT SIGNIFICANT VOIDS, AND FORMING A DENSE, COMPACTED FILL MATRIX. TEST BY ASTM D1556, D2922 AND/OR D3017 WHEN APPROPRIATE. RECORD LIMITS AND ELEVATION OF BLANKET. ALL FILL AND COMPACTION OPERATIONS TO BE CONDUCTED UNDER THE OBSERVATION OF THE GEOTECHNICAL ENGINEER. SUBSEQUENT LIFTS TO BE APPLIED ONLY AFTER OBSERVATION AND CONFIRMATION OF SUITABILITY OF FILL AND RELEASE BY THE GEOTECHNICAL ENGINEER. BLANKETS TO BE CONSTRUCTED IN ACCORDANCE WITH PLATE G-12.

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VER. 3/12

PLATE G-13

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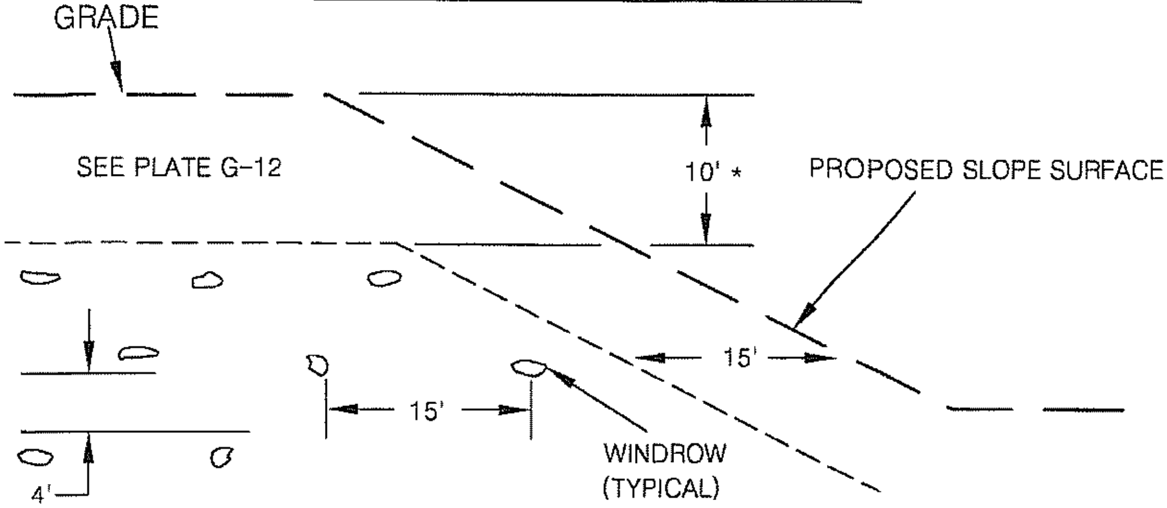
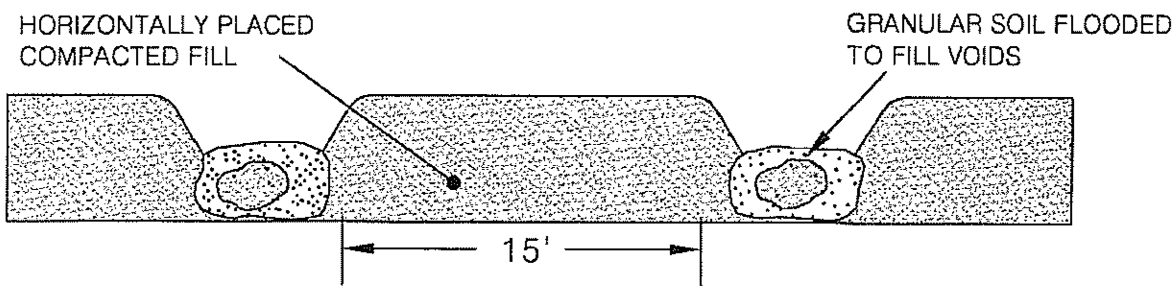
ROCK WINDROW DETAIL



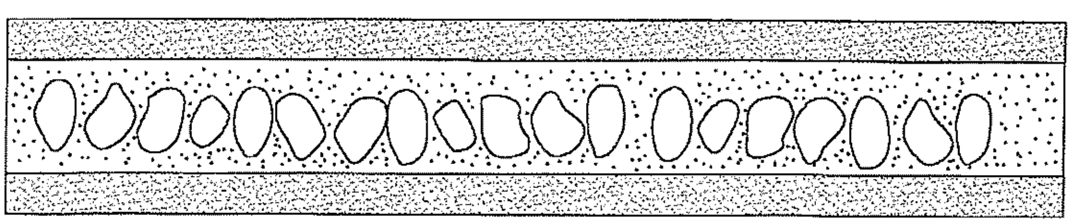
NOTE: OVERSIZED MATERIAL SHOULD BE REMOVED FROM THE 15' CLEAR ZONES WITH SPECIAL EQUIPMENT, SUCH AS A ROCK RAKE, PRIOR TO PLACING THE NEXT FILL LIFT.
*VARIANCES TO THE ABOVE ROCK HOLD DOWN MAY BE GRANTED SUBJECT TO APPROVAL BY THE OWNER, GEOTECHNICAL ENGINEER, AND GOVERNING AGENCY

TYPICAL WINDROW DETAIL (END VIEW)



NOTE: COMPACTED FILL SHALL BE BROUGHT UP TO A HIGHER ELEVATION ALONG EACH WINDROW SO GRANULAR SOIL CAN BE FLOODED IN A "TRENCH CONDITION".

PROFILE VIEW



ALTA CALIFORNIA GEOTECHNICAL, INC .
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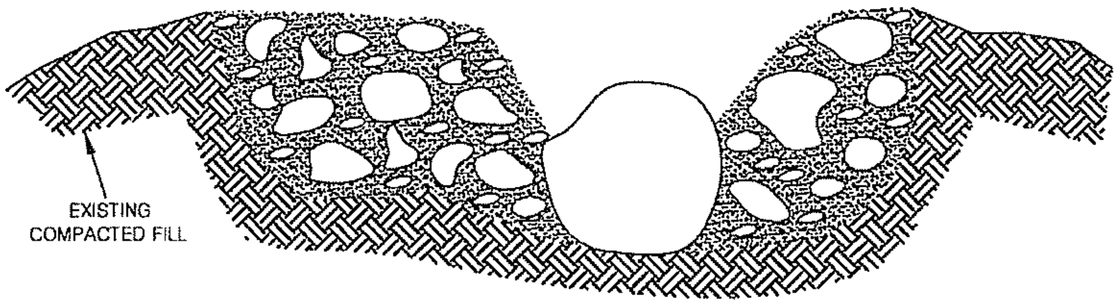
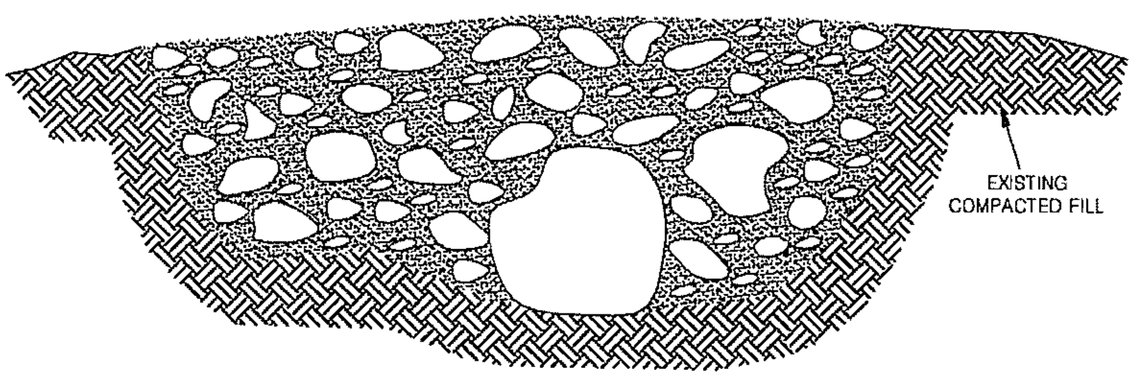
PLATE G-14

PATH: \\LS-WTGL96E\share\Alta California Geotechnical\Drafting\GRADING DETAILS\G-14.dwg

ISOLATED ROCK BURIAL DETAILS



EXCAVATE HOLE INTO EXISTING FILL PRISM, PLACE BOULDER (< 8 feet in maximum dimension) INTO EXISTING COMPACTED FILL. SURROUND WITH SAND, GRAVEL, COBBLES AND WATER HEAVILY. TRACK WITH D8 OR LARGER EQUIPMENT UNTIL RESULTING FILL FULLY SUPPORTS EQUIPMENT. OBSERVE AND/OR TEST IN ACCORDANCE WITH ASTM D1556, D2922 OR D3017. ROCKS LARGER THAN 8 FEET SHALL BE FURTHER REDUCED IN SIZE BY SECONDARY BREAKING.



ALTA CALIFORNIA GEOTECHNICAL, INC .
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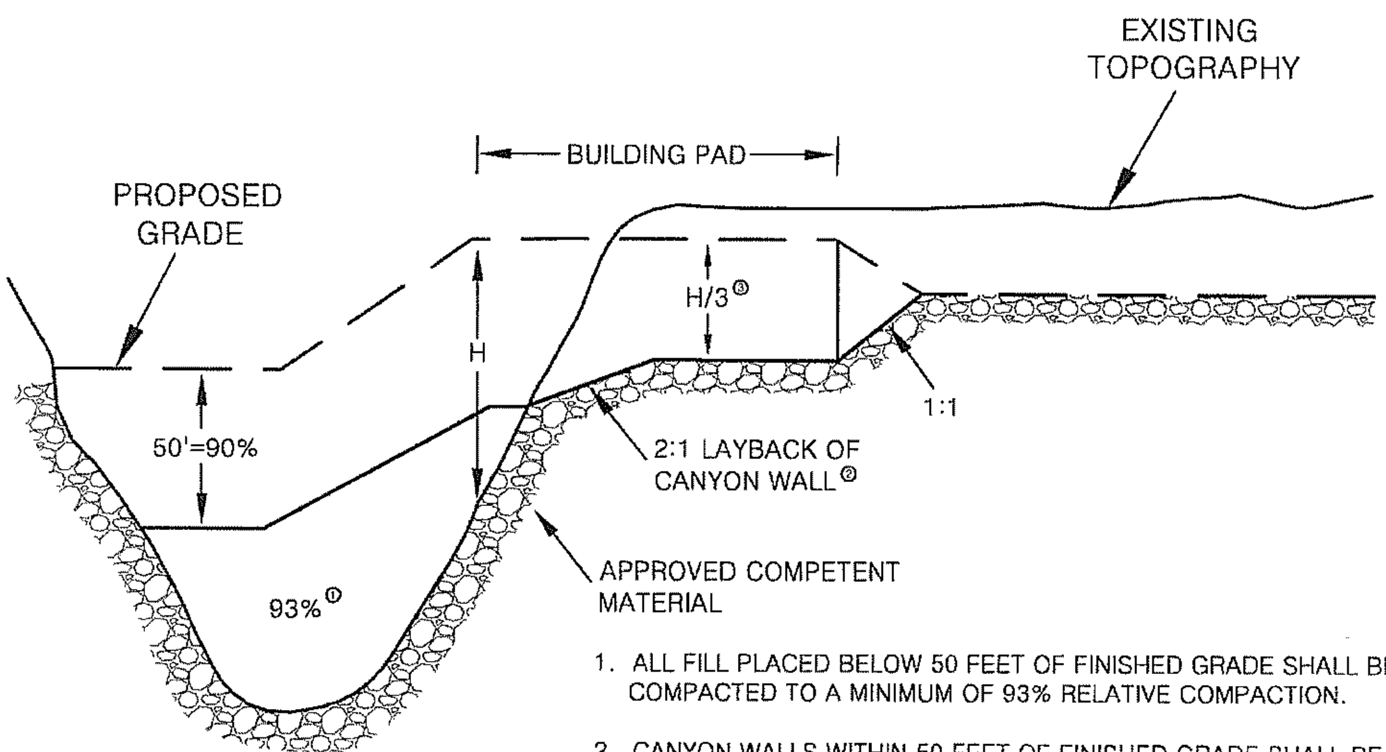
PLATE G-15

PATH:\\LS-WTGL96E\share\Alta California Geotechnical\Drafting\GRADING DETAILS\G-15.dwg

RELATIVE COMPACTION VS. DEPTH

CANYON WALL LAY BACK
DIFFERENTIAL FILL OVEREXCAVATION DETAILS



1. ALL FILL PLACED BELOW 50 FEET OF FINISHED GRADE SHALL BE COMPACTED TO A MINIMUM OF 93% RELATIVE COMPACTION.

2. CANYON WALLS WITHIN 50 FEET OF FINISHED GRADE SHALL BE LAID BACK TO A SLOPE RATIO OF 2:1 OR FLATTER.

3. ALL BUILDING PADS SHALL BE OVER EXCAVATED TO A MINIMUM OF 1/3 OF THE MAXIMUM DEPTH OF FILL BELOW THE BUILDING PAD TO A MAXIMUM OF 17 FEET.

4. IF THE 2:1 LAY BACK OF THE CANYON WALL IS IMPRACTICAL, THEN AS AN ALTERNATIVE THE INCREASED COMPACTION STANDARDS IN NOTE 1 SHOULD BE EXTENDED UP TO H/3 AND THE LAY BACK WILL NOT BE REQUIRED.

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PLATE G-16

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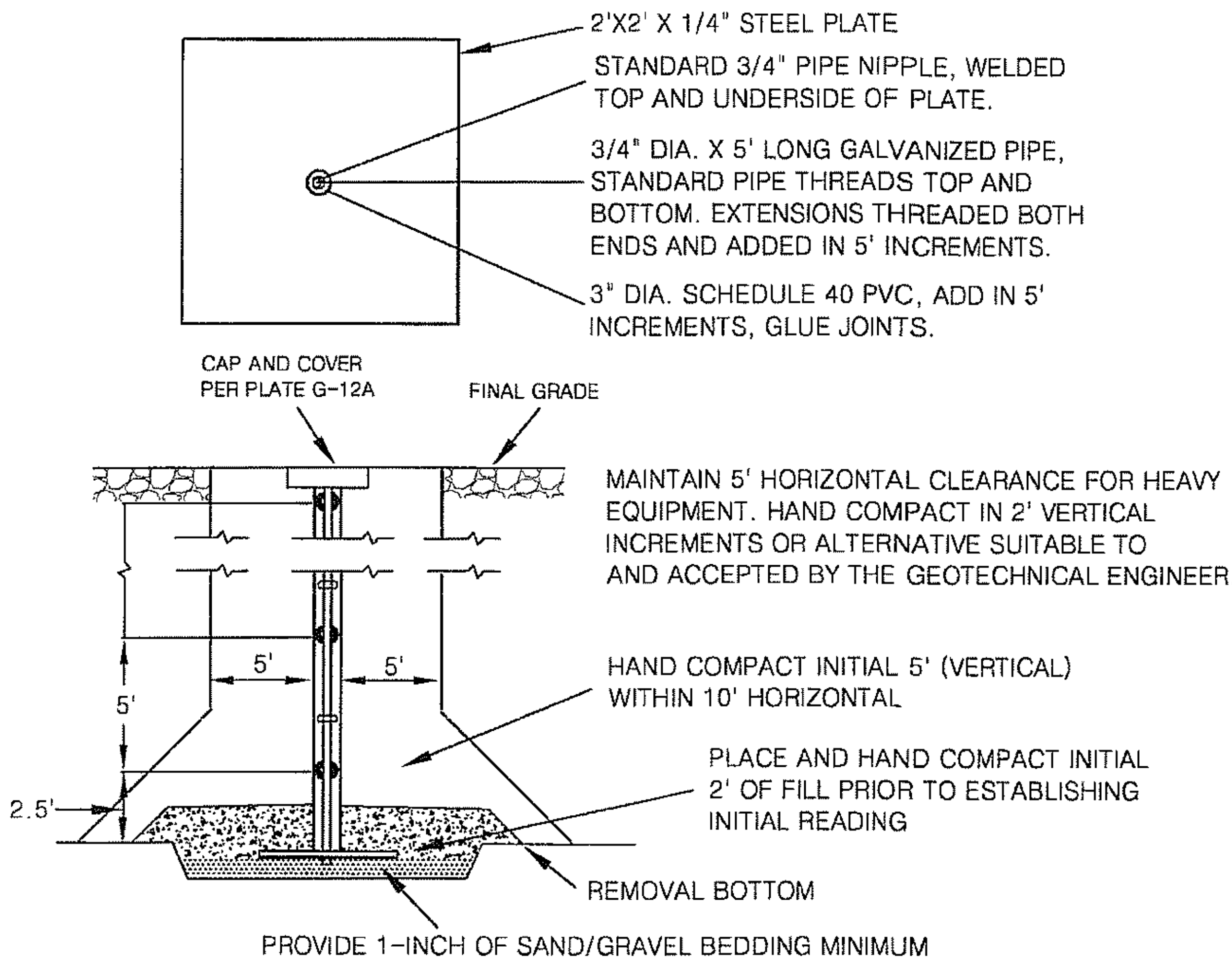
SETTLEMENT PLATE DETAIL



NOTES:

1) LOCATIONS OF SETTLEMENT PLATES SHALL BE CLEARLY MARKED AND READILY VISIBLE (RED FLAGGED) TO EQUIPMENT OPERATORS.

2) CONTRACTOR SHALL MAINTAIN 10' HORIZONTAL CLEARANCE FOR HEAVY EQUIPMENT WITHIN 5' (VERTICAL) OF PLATE BASE. FILL WITHIN CLEARANCE AREA SHALL BE HAND COMPACTED TO PROJECT SPECIFICATIONS OR COMPACTED BY ALTERNATIVE APPROVED BY THE GEOTECHNICAL ENGINEER.

3) AFTER 5' (VERTICAL) OF FILL IS IN PLACE, CONTRACTOR SHALL MAINTAIN 5' HORIZONTAL EQUIPMENT CLEARANCE. FILL IN CLEARANCE AREA SHALL BE HAND COMPACTED (OR APPROVED ALTERNATIVE) IN VERTICAL INCREMENTS NOT TO EXCEED 2 FEET.

4) IN THE EVENT OF DAMAGE TO SETTLEMENT PLATE OR EXTENSION RESULTING FROM EQUIPMENT OPERATING WITHIN PRESCRIBED CLEARANCE AREA, CONTRACTOR SHALL IMMEDIATELY NOTIFY GEOTECHNICAL ENGINEER AND SHALL BE RESPONSIBLE FOR RESTORING THE SETTLEMENT PLATE AND EXTENSION RODS TO WORKING ORDER.

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VER. 3/12

PLATE G-17

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SURFACE SETTLEMENT MONUMENT DETAIL

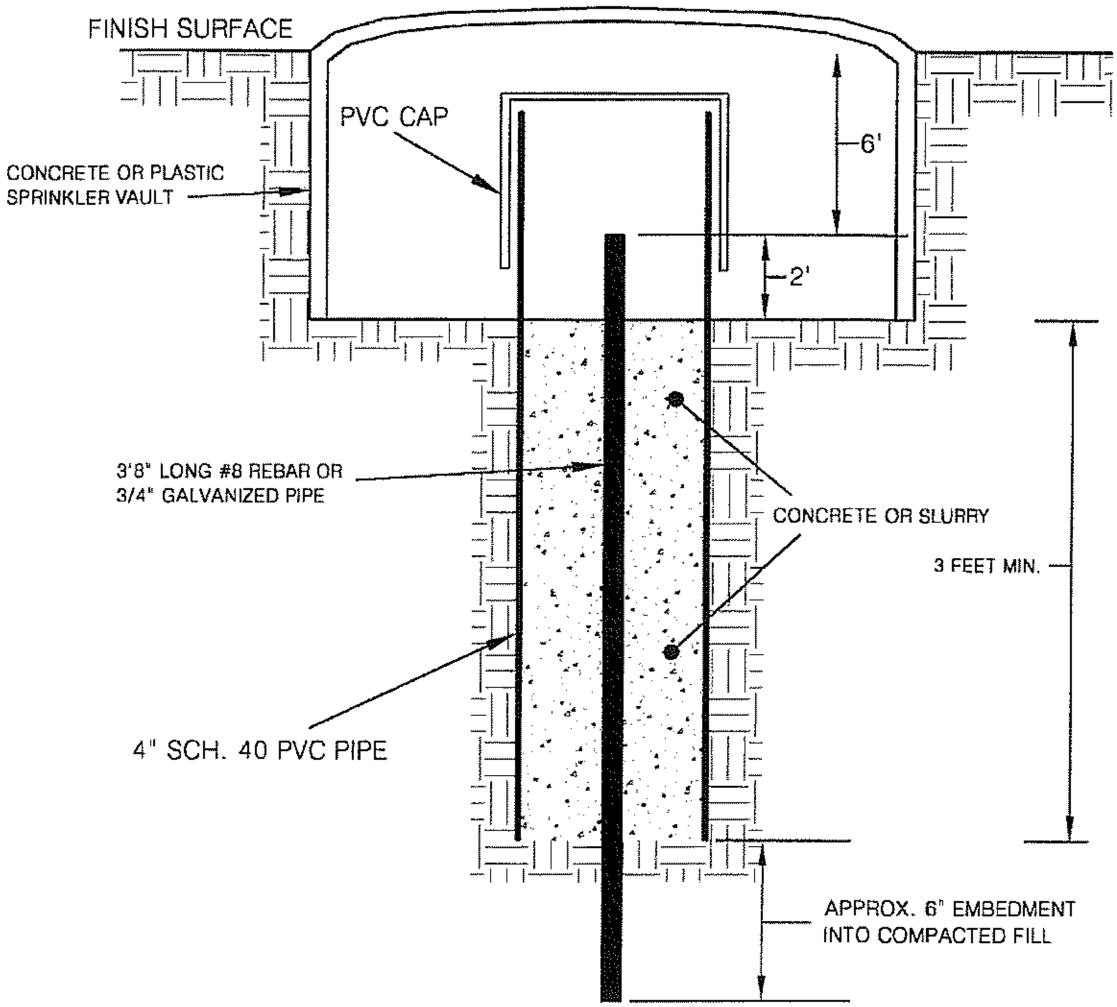

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PLATE G-18

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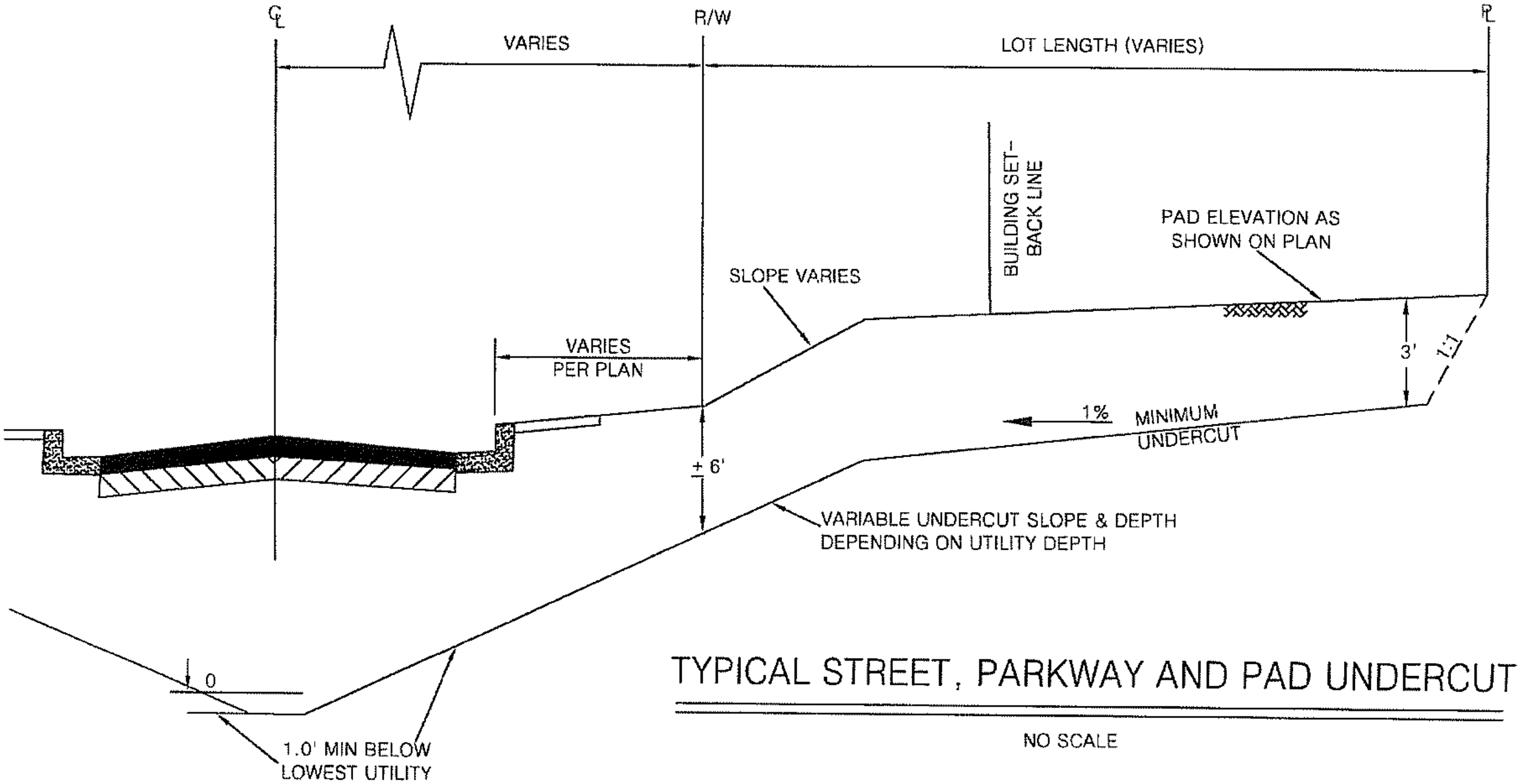


TYPICAL STREET, PARKWAY AND PAD UNDERCUT

NO SCALE

ALTA CALIFORNIA GEOTECHNICAL, INC .
VER. 3/13

PLATE G-19

PATH: \\LS-WTGL96E\share\Alta California Geotechnical\Drafting\GRADING DETAILS\G-19.dwg

ALTA CALIFORNIA
GEOTECHNICAL INC.

170 North Maple Street, Suite 108
Corona, CA 92880
www.altageotechnical.com

CV COMMUNITIES
3121 Michleson Drive, Suite 150
Irvine, California 92612

August 5, 2015
Project Number 1-0152

Attention: Mr. Adam Smith

Subject: ***SUPPLEMENTAL TO PRELIMINARY GEOTECHNICAL INVESTIGATION***
Armstrong Ranch Specific Plan, DeBoer Parcels
City of Ontario, California

References:

1. Preliminary Geotechnical Investigation, Armstrong Ranch Specific Plan, DeBoer Parcels, City of Ontario, County of San Bernardino, California, by Alta California Geotechnical, Inc., dated April 14, 2015 (Project Number 1-0152).
2. 2013 Annual report of the Land Subsidence Committee, prepared for Chino Basin Watermaster, dated July 10, 2014, by Wildermuth Environmental, Inc.

Mr. Smith:

Presented herein is Alta California Geotechnical, Inc.'s (Alta's) supplemental to the referenced preliminary geotechnical investigation report for the Armstrong Ranch Specific Plan, in the City of Ontario, California. Specifically, this letter addresses the potential for subsidence onsite and provides the design peak ground acceleration.

Subsidence

There is a potential for subsidence within the Ontario area due to groundwater extraction from the Chino Basin. Per the Reference 2 report, subsidence throughout the area is relatively slow and uniform. As such, it is anticipated that if subsidence due to groundwater extraction were to occur, it would affect the entire region and not result in significant differential settlement across the site.

Peak Ground Acceleration

To determine site specific earthquake acceleration information, Alta performed a probabilistic seismic hazard analysis utilizing the USGS Interactive Deaggregation web site: https://geohazards.usgs.gov/deaggint/2008/. The resultant peak ground acceleration was 0.703g, utilizing a 2% probability of exceedance in 50 years, per the 2013 CBC (See Plate 1 for result).

The opportunity to be of service is greatly appreciated. If you have any questions or should you require any additional information, please contact the undersigned at (858) 674-6636. Alta appreciates the opportunity to provide geotechnical consulting services for your project.

Sincerely,

Alta California Geotechnical, Inc.

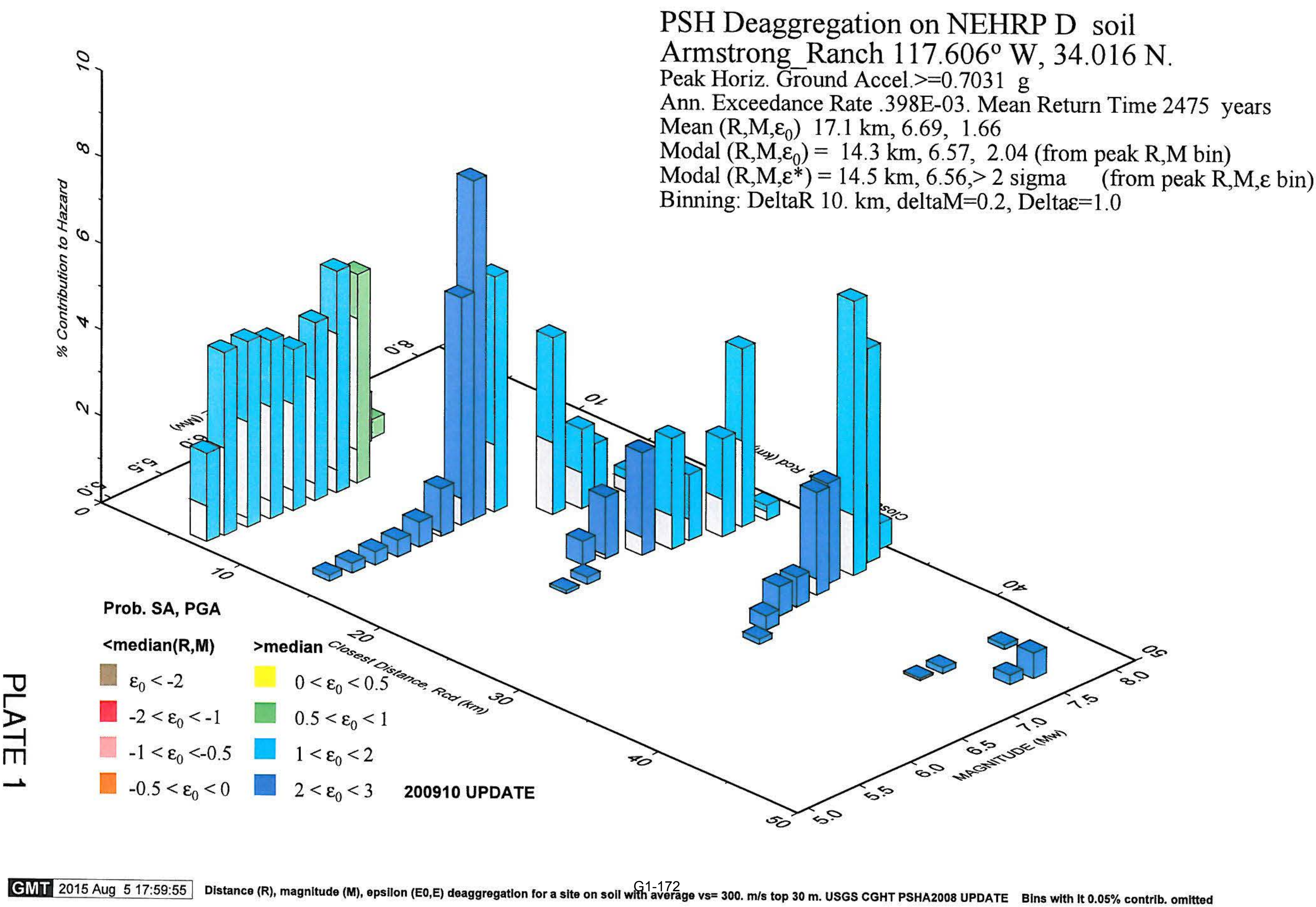
By: ______________________

SCOTT A. GRAY/RGE 2857
Reg. Exp.: 12-31-16
Registered Geotechnical Engineer
Vice President

REGISTERED PROFESSIONAL ENGINEER
SCOTT A. GRAY
No. 2857
Exp. 12-31-16
GEOTECHNICAL
STATE OF CALIFORNIA

Distribution: (1) Addressee

SAG: 1-0152, August 5, 2015 (Supplemental to Geo Investigation, Armstrong Ranch)



PSH Deaggregation on NEHRP D soil
Armstrong_Ranch 117.606° W, 34.016 N.
Peak Horiz. Ground Accel.>=0.7031 g
Ann. Exceedance Rate .398E-03. Mean Return Time 2475 years
Mean (R,M,ε_0) 17.1 km, 6.69, 1.66
Modal (R,M,ε_0) = 14.3 km, 6.57, 2.04 (from peak R,M bin)
Modal (R,M,ε*) = 14.5 km, 6.56,> 2 sigma (from peak R,M,ε bin)
Binning: DeltaR 10. km, deltaM=0.2, Deltaε=1.0
% Contribution to Hazard
0
2
4
6
8
10
Closest Distance, Rcd (km)
10
20
30
40
50
MAGNITUDE (Mw)
5.0
5.5
6.0
6.5
7.0
7.5
8.0
Prob. SA, PGA
<median(R,M)
>median
$\varepsilon_0 < -2$
$-2 < \varepsilon_0 < -1$
$-1 < \varepsilon_0 < -0.5$
$-0.5 < \varepsilon_0 < 0$
$0 < \varepsilon_0 < 0.5$
$0.5 < \varepsilon_0 < 1$
$1 < \varepsilon_0 < 2$
$2 < \varepsilon_0 < 3$
200910 UPDATE
GMT 2015 Aug 5 17:59:55
Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on soil with average vs= 300. m/s top 30 m. USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

PLATE 1

Appendix G2 Stadium Geotechnical Report

Appendices

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GEOTECHNICAL INVESTIGATION
FOR
ONTARIO SPORTS COMPLEX
SE CORNER OF EAST RIVERSIDE DR AND ONTARIO AVE
ONTARIO, CA

for

City of Ontario
1425 S Bon View Ave.
Ontario, CA 91761

October 18, 2023
Updated December 6, 2023

00-232255-01

RMA Group
Every *Project* **Matters** | www.rmacompanies.com

October 18, 2023
Updated December 6, 2023

City of Ontario
1425 S Bon View Ave.
Ontario, CA 91761

Attention: Daniel Beers, Design & Construction – Principal Project Manager

Subject: Geotechnical Investigation for
Ontario Sports Complex
SE Corner of East Riverside Dr and Ontario Ave
Ontario, CA

Dear Mr. Beers:

In accordance with your request, a geotechnical investigation has been completed for the above referenced project. The report addresses both engineering geologic and geotechnical conditions. The results of the investigation are presented in the accompanying report, which includes a description of site conditions, results of our field exploration, laboratory testing, conclusions, and recommendations.

We appreciate this opportunity to be of continued service to you. If you have any questions regarding this report, please do not hesitate to contact us at your convenience.

Respectfully submitted,

RMA Group

Ken Dowell, PG, CEG
Project Geologist
CEG 2470

PROFESSIONAL GEOLOGIST
KENNETH R. DOWELL
No. 2470
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Haitham Dawood, PhD|PE|GE
Engineering Manager
GE 3227

REGISTERED PROFESSIONAL ENGINEER
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Carson 310.684.4854 | Concord 925.243.6662 | Rancho Cucamonga 909.989.1751
Sacramento 916.631.7194 | San Diego 858.609.7138 | San Jose 408.362.4920

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(Continued)

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1.00 INTRODUCTION

1.01 Purpose

A draft geotechnical investigation has been completed for a portion of the proposed Sports Complex located at the southeast corner of Vineyard Avenue and East Riverside Drive in the City of Ontario, California, California. This draft reports includes the northeastern portion of the project, specifically the proposed baseball stadium and parking structure. Location of the area subject to this draft report is indicated on Figure 3. A final report will be issued for the whole project area once full field exploration is completed. The purpose of the investigation was to summarize geotechnical and geologic conditions at the site, to assess their potential impact on the proposed development, and to develop geotechnical and engineering geologic design parameters.

1.02 Scope of the Investigation

The general scope of this investigation included the following:

- Review of published and unpublished geologic, seismic, groundwater and geotechnical literature.
- Examination of aerial photographs.
- Contacting of underground service alert to locate onsite utility lines.
- Logging, sampling and backfilling of 17 exploratory borings drilled with a CME-75 drill rig for this portion of the project. At total of 22 borings are proposed throughout the entire project area.
- Performance of 2 soil infiltration tests in accordance with the borehole method detailed in the San Bernardino County Technical Guidance for Water Quality Management Plans.
- Laboratory testing of representative soil samples.
- Geotechnical evaluation of the compiled data.
- Preparation of this report presenting our findings, conclusions and recommendations.

Our scope of work did not include a preliminary site assessment for the potential of hazardous materials onsite.

1.03 Site Location and Description

The proposed sports complex will be located at the southeast corner of southeast corner of East Riverside Drive and Vineyard Avenue in the southeast portion of the City of Ontario, San Bernardino County, California. Ontario Avenue crosses the site. The proposed baseball stadium and parking structure is located in the northeast portion of the overall site.

The site is bounded by East Riverside Drive to the north, the Cucamonga Creek Channel to the east, Chino Avenue to the south and, a nursery, and RV and boat storage property, and agricultural fields to the west (Figure 1). Its geographic position is at Latitude 34.017890° and Longitude -117.604962°. Elevation range from 750 to 780 feet above sea level.

1.04 Current and Past Land Usage

The site is currently utilized for various purposes. A dairy is located in the northeast part, agricultural fields are located on the south half of the site and an unused field is located in the northwest portion of the site. The dairy includes animal pens, a milk barn, other structures used for residences, office, equipment and feed storage. The pens are surrounded by metal pipe fencing and there are additional perimeter and some interior barbed wire fencing. The portion of the site between Ontario Avenue and the Cucamonga Creek Channel is used for nurseries, a few residential structures and horse stables. Five basins used to hold dairy water is located south of the dairy. The basins are surrounded by earthen berms. An earthen berm is located at the south end of the site, along Chino Avenue. Three dry basins surrounded by earthen berms are also located in the southeast corner of the site.

Historically, the site was used as orchards and agricultural fields since before 1938 until the late 1950’s and early 1960’s when the dairy was constructed. The east half of the current dairy was at this time used to house and train racehorses. The portion of the site east of Ontario Avenue had a dairy constructed on the north half in the late 1950’s. A few residential structures and agricultural fields appear in the south half in the 1980’s. The current nursery appears in the 2010’s.

1.05 Planned Usage

It is our understanding that the proposed construction will consist of A minor league baseball stadium, a hotel, two parking structures, a gymnasium building, community center, community pool, a skate park retail structures, several sports fields including soccer, baseball and tennis courts and associated surface paved parking and roads.

Our investigation was performed prior to the preparation of grading or foundation plans. To aid in preparation of this report, we utilized the following assumptions:

- Maximum foundation loads of 2 to 3 kips per linear foot for continuous footings and 50 kips for isolated spread footings. As foundation loads are known they should be provided to determine if revised recommendations would be needed.
- Cuts and fills will be less than 5 feet except in the area of the baseball stadium where excavation of up to 20 feet is proposed.

1.06 Investigation Methods

Our investigation consisted of office research, field exploration, laboratory testing, review of the compiled data, and preparation of this report. It has been performed in a manner consistent with generally accepted engineering and geologic principles and practices, and has incorporated applicable requirements of California Building Code. Definitions of technical terms and symbols used in this report include those of the ASTM International, the California Building Code, and commonly used geologic nomenclature.

Technical supporting data are presented in the attached appendices. Appendix A presents a description of the methods and equipment used in performing the field exploration and logs of our subsurface exploration. Appendix B presents a description of our laboratory testing and the test results. Standard grading specifications and references are presented in Appendices C and D, respectively.

2.00 Findings

2.01 Geologic Setting

The site is located on a deep structural depression known as the upper Santa Ana River Valley. According to Fife and others (1976), the alluvial deposits beneath the site are approximately 700 to 900 feet thick and rest on a basement of granitic bedrock.

The upper Santa Ana River Valley is bordered by the San Gabriel Mountains and the active Cucamonga fault to the north, and the Puente Hills and potentially active Chino fault to the west. To the south are the Jurupa Mountains and other resistant granitic and metamorphic hills. The eastern boundary of the valley is the San Bernardino Mountains and the active San Andreas fault.

According to regional geologic mapping by Bedrossian, Hayhurst and Roffers (2010), the site is underlain by Holocene to late Pleistocene age young eolian and dune deposits (Figure 2).

2.02 Earth Materials

Our subsurface investigation encountered manure and manure impacted soil, asphalt, concrete, artificial fill and alluvium.

The manure and manure impacted soils were encountered and observed in the animal pens. The manure and manure impacted soils thickness ranged from only a few inches up to a couple feet. The manure and manure impacted soils were thicker along the edges of the pens and, particularly, between the feed aisle and shade structures in the pens where the cows congregate. Actual thickness of the manure and manure impacted soils will vary. It is typical that dairy operators will drag the pens to limit wet manure buildup by redistributing the surface by dragging the surface and moving areas of wet manure. They will also typically remove manure buildup prior to winter and then again after winter. The areas of thicker manure are the pens used for the dairy cows. The pens not used for dairy cows have thinner amounts of manure. The basins should be expected to include manure impacted soil at their bottom, but how much is unknown at this time since the basins contained water at the time of our field investigation and thus inaccessible.

Asphalt was observed as pavement throughout the dairy and is three to four inches or less in thickness. The concrete was observed and encountered as pavement, particularly in the feed aisles between the pens. The concrete pavement is assumed to be six to eight inches thick. Other area of concrete pavement was found to be three to four inches thick.

Artificial fill was encountered consisting of gray silty sand in the pens that was encountered under the manure and was about a foot thick. This fill is expected to range from a few inches to up to three feet in the pens. The fill was placed to create drainage in the pens away from the feed aisles to the rear of the pens. Artificial fill was also observed as earthen berm around the basins and in the southern portion of the site. The soil in the berms appears to be excavated from the basins and is similar to the alluvial soil.

Alluvial soils encountered in our borings and observed around the site consisted of consisted of light brown to grayish-brown and brown silty fine sand with thin layers of clay, sandy silt and trace to minor amounts of gravel. Isolated filled old stream channels were also encountered where layers of sand were encountered in a boring, but these sand layers were not continuous across the site between borings. This is typical of alluvial depositional environments.

The subsurface soils encountered in the exploratory borings drilled at the site are described in greater detail on the logs contained in Appendix A.

2.03 Expansive Soils

Expansion testing performed in accordance with ASTM D4829 indicates that earth materials underlying the site have an expansion classification of very low.

Results of expansion test and other soil index tests are presented in Appendix B. Since site grading will redistribute earth materials, potential expansive properties should be verified at the completion of rough grading.

2.04 Surface and Groundwater Conditions

Areas of ponding or standing water were present at the time of our study. Standing water was observed within the dairy wash ponds located in the east center of the site. Based upon the topography of the site, the depth of water within the basins is expected to be less than 10 feet. Water within these basins is from runoff of wash water from the milk barn and not surface expression of groundwater levels and subsurface infiltration from the basins is expected to yield very limited saturated soils around the base of the basins, particularly south of the basins due to the natural gradient of the site. Since the basing will be pumped dry and filled with engineered fill, the water in the basins will not affect the proposed development.

Further, no springs or areas of natural seepage were found. According to Carson and Matti, 1985, the depth to groundwater beneath the project is ranges from 150 to 175 feet below the ground surface. A water well (State well 340045N1176407W001) located about 2 miles southwest of the site had a groundwater measurement on April 14, 2022 of 136 feet below the ground surface. The ground surface elevation at the well is 30 to 60 feet below the site, therefore the depth to groundwater based on the well measurement would be about 160 to 190 feet below the ground surface.

2.05 Faults

The site is not located within the boundaries of an Earthquake Fault Zone for fault-rupture hazard as defined by the Alquist-Priolo Earthquake Fault Zoning Act and no faults are known to pass through the property. The nearest Earthquake Fault Zone is located about 7 miles to the west of the site along the Chino Central Avenue fault.

The nearest fault is the Chino Central Avenue fault located approximately 7 miles to the west.

The accompanying Regional Fault Map (Figure 4) illustrates the location of the site with respect to major faults in the region. The distance to notable faults within 100 kilometers of the site is presented on Table 1.

2.06 Historic Seismicity

The nearest historic strong earthquakes were epicentered within about 18 miles from the site. They were the 6.0 magnitude San Bernardino Earthquake that occurred in 1923 on the San Jacinto Fault and the 6.0 magnitude that occurred in the San Bernardino area in 1858. Historic strong earthquakes in the southern California region are summarized on Table 2.

Strong earthquakes that have occurred in this region in historic time and their approximate epicentral distances are summarized in Table 2.

2.07 Flooding Potential

According to the Federal Emergency Management Agency (F.I.R.M. Map No. 06071C8638H, dated August 28, 2008) the site is located in a flood hazard zone designated Zone X with 0.2 percent annual chance flood hazard, typically referred to a 500-year flood zone.

Control of surface runoff originating from within and outside of the site should, of course, be included in design of the project.

2.08 Landslides

Due to the low gradient of the site and surrounding area, landsliding is not a hazard at this property.

3.00 Conclusions and Recommendations

3.01 General Conclusion

Based on specific data and information contained in this report, our understanding of the project and our general experience in engineering geology and geotechnical engineering, it is our professional judgment that the proposed development is geologically and geotechnically feasible. This is provided that the recommendations presented below are fully implemented during design, grading and construction.

3.02 General Earthwork and Grading

All grading should be performed in accordance with the General Earthwork and Grading Specifications outlined in Appendix C, unless specifically revised or amended below. Recommendations contained in Appendix C are general specifications for typical grading projects and may not be entirely applicable to this project.

It is also recommended that all earthwork and grading be performed in accordance with Appendix J of the 2022 California Building Code and all applicable governmental agency requirements. In the event of conflicts between this report and Appendix J, this report shall govern.

3.03 Earthwork Shrinkage and Subsidence

Shrinkage is the decrease in volume of soil upon removal and recompaction expressed as a percentage of the original in-place volume. Subsidence occurs as natural ground is densified to receive fill. These factors account for changes in earth volumes that will occur during grading. Our estimates are as follows:

- Shrinkage factor = 7% - 12% for soil removed and replaced as compacted fill.
- Subsidence factor = 0.15 foot.

The degree to which fill soils are compacted and variations in the insitu density of existing soils will influence earth volume changes. Consequently, some adjustments in grades near the completion of grading could be required to balance the earthwork.

3.04 Removals and Overexcavation

All vegetation, trash and debris should be cleared from the grading area and removed from the site. Prior to placement of compacted fills, all non-engineered fills and loose, porous, or compressible soils will need to be removed down to competent ground. Removal and requirements will also apply to cut areas, if the depth of cut is not sufficient to reach competent ground. Removed and/or overexcavated soils may be moisture-conditioned and recompacted as engineered fill, except for soils containing detrimental amounts of organic material. Estimated depths of removals are as follows:

- Non-engineered fill ranging from less than 1 foot to 3 feet deep was encountered and observed within the property, particularly within the existing cattle pens. Non-engineered fill ranging from 1 to 10 feet in height was also observed as earthen berms around the dairy basins and in the southern portion of the site. Complete removal of these fills and underlying compressible native soils will need to be performed. If other non-engineered fills are encountered during grading, they will also need to be removed along with any underlying compressible native soils.

- Manure and manure impacted soils were encountered and observed within the existing cattle pens. At the time of our field investigation, manure in the pens ranged from only a few inches up to 2 to 3 feet thick. The amount of manure on the surface of the pens will vary and the actual thickness when dairy operations cease will be different than what was encountered during our field investigation. Additional investigation of manure and manure impacted soil should be done after dairy operations have ceased or during demolition and cleanup of the dairies and prior to commencement of grading to determine actual removals needed. It is expected that manure impacted soils will be found at the bottom of the dairy wash ponds, however at the time of our field investigation they were full of water and inaccessible. Actual depth of removal of these soils should be reviewed once the basing have been pumped dry after the dairy operations cease.

- Loose, porous and compressible native soils were encountered to depths of about 2 to 5 feet below existing grades. The average depth of removal of these soils is expected to be 4 feet with some local areas extending to 6 feet below the existing ground surface or the base of existing non-engineered fill.

- Areas of deep excavations, such as the baseball stadium that is planned for excavation to reach field level of over 15 feet, that competent native soil will be encountered. At these deeper removals, once design elevation is reached the geotechnical engineer's representative should review soil conditions and if found suitable the surface should be scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density.

- It is expected that competent native soils will be encountered in cuts deeper than approximately 3 to 5 feet below existing grade or the base of existing non-engineered fill. Provided competent soils are exposed, these cut surfaces should be scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density, provided that footing overexcavation requirements are met.

- Soils disturbed by demolition of existing structures will need to be over-excavated to competent native ground and then scarified to a minimum depth of 12 inches, moisture conditioned and compacted to at least 90 percent of the maximum dry density

- The asphalt and concrete currently onsite may be either processed and placed in the compacted fill, or hauled off the site. If the asphalt and concrete is use as fill material, it must be broken down to approximately 4 to 8-inch particles and mixed thoroughly with on-site soils. No large and flat pieces are to be used for fill. If asphalt is processed by grinding, it cannot be used in fills and must be removed from the site.

In addition to the above requirements, overexcavation will also need to meet the following criteria for the building pads, concrete flatwork and pavement areas:

- All footing areas, both continuous and spread, shall be undercut, moistened, and compacted as necessary to produce soils compacted to a minimum of 90% relative compaction to a depth equal to the width of the footing below the bottom of the footing or to a depth of 3 feet below the bottom of the footing, whichever is less. Footing areas shall be defined as the area extending from the edge of the footing for a distance of 5 feet.

- All floor slabs, concrete flatwork and paved areas shall be underlain by a minimum of 12 inches of soil compacted to a minimum of 90% relative compaction.

- Overexcavation will not be required for the pole foundations.

The exposed soils beneath all overexcavation should be scarified an additional 12 inches, moisture conditioned and compacted to a minimum of 90% relative compaction.

The above recommendations are based on the assumption that soils encountered during field exploration are representative of soils throughout the site. However, there can be unforeseen and unanticipated variations in soils between points of subsurface exploration. Hence, overexcavation depths must be verified, and adjusted if necessary, at the time of grading. The overexcavated materials may be moisture-conditioned and re-compacted as engineered fill.

3.05 Rippability and Rock Disposal

Our exploratory borings were advanced without difficulty and no oversize materials were encountered in our subsurface investigation. Accordingly we expect that all earth materials will be rippable with conventional heavy duty grading equipment and oversized materials are not expected.

3.06 Subdrains

Groundwater and surface water were not encountered during the course of our investigation, the proposed grading is will not fill any large canyons and the underlying soils are fairly permeable. Consequently, installation of canyon subdrains is not expected to be necessary.

3.07 Permanent Fill and Cut Slopes

Fill and cut slopes constructed at inclinations of 2 horizontal to 1 vertical or flatter are expected to be grossly and surficially stable. This is provided that fill slopes are properly keyed and compacted, as indicated in Appendix C, and cut slopes expose competent native soils. Cut and fill slope stability should be further reviewed upon development of a grading plan.

3.08 Faulting

Since the site is not located within the boundaries of an Earthquake Fault Zone and no faults are known to pass through the property, surface fault rupture within the site is considered unlikely.

3.09 Seismic Design Parameters

The potential damaging effects of regional earthquake activity must be considered in the design of structures.

ASCE 7-16, Site-Specific Response Spectra

A site-specific seismic hazard has been performed using the SCEC UGMS MCER Tool available at https://data2.scec.org/ugms-mcerGM-tool_v18.4/ in accordance with the 2022 California Building Code and Section 21 of ASCE 7-16. A risk category of III was also utilized. The methodology and results of the site-specific analysis are presented in Appendix D. The recommended site-specific seismic design parameters are summarized in the table below.

Site Specific Design Parameters

Design Acceleration Parameter	Value (g)
S_{DS}	1.349
S_{D1}	0.806
S_{MS}	2.024
S_{M1}	1.210

The numerical values for the site-specific MCE_R and Design response spectra are provided in the table below.

Period (s)	Site Specific MCER Sa (g)	Site Specific Design Response Spectrum (g)
0.01	0.932	0.621
0.02	0.936	0.624
0.03	0.955	0.637
0.05	1.066	0.711
0.075	1.269	0.846
0.1	1.442	0.961
0.15	1.716	1.144
0.2	1.928	1.285
0.25	2.111	1.408
0.3	2.249	1.499
0.4	2.24	1.493
0.5	2.07	1.38
0.75	1.58	1.054
1	1.21	0.806
1.5	0.785	0.523
2	0.559	0.372
3	0.348	0.232
4	0.248	0.165
5	0.192	0.128
7.5	0.117	0.078
10.0	0.077	0.052

The Seismic Design Category is D for all Risk Categories (CBC Section 1613A.5.6). Consequently, as required for Seismic Design Categories D through F by CBC Section 1803A.5.12, lateral pressures for earthquake ground motions, liquefaction and soil strength loss have been evaluated (see Sections 3.10 and 3.16).

In addition, the calculated maximum considered earthquake geometric mean peak ground acceleration (MCE_G) is PGA_M = 0.778g.

3.10 Liquefaction and Secondary Earthquake Hazards

Potential secondary seismic hazards that can affect land development projects include liquefaction, tsunamis, seiches, seismically induced settlement, seismically induced flooding and seismically induced landsliding.

Liquefaction

Liquefaction is a phenomenon where earthquake-induced ground motions increase the pore pressure in saturated, sand-like soils until it is equal to the confining, overburden pressure. When this occurs, the soil can completely lose its shear strength and enter a liquefied state. The possibility of liquefaction is dependent upon grain size, relative density, confining pressure, saturation of the soils, and intensity and duration of ground motion. In order for liquefaction to occur, three criteria must be met: underlying loose, sand-like soils, a groundwater depth of less than about 50 feet, and a potential for seismic shaking from nearby large-magnitude earthquake.

As ground water table was not encountered in the upper 50 ft and per Section 2.04 above, the ground water table may be much deeper, liquefaction at the site is unlikely to occur and hence it is not a design concern.

Tsunamis and Seiches

Tsunamis are sea waves that are generated in response to large-magnitude earthquakes. When these waves reach shorelines, they sometimes produce coastal flooding. Seiches are the oscillation of large bodies of standing water, such as lakes, that can occur in response to ground shaking. Tsunamis and seiches do not pose hazards due to the inland location of the site and lack of nearby bodies of standing water.

Seismically Induced Settlement

Seismically induced settlement occurs most frequently in areas underlain by loose, granular sediments. Damage as a result of seismically induced settlement is most dramatic when differential settlement occurs in areas with large variations in the thickness of underlying sediments. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement.

Seismic settlement was evaluated for the Design Earthquake event using an empirical method developed by Tokimatsu and Seed (1987) based on site-specific SPT blow count and grain size data obtained from our borings. We estimate 0.70-inch of total seismically induced ground settlement may occur at the site when subjected to a Design Earthquake event (see calculations in Appendix D). In our opinion, differential seismic settlement may be taken as one-half of the computed total seismic settlement over 30 feet. Calculations of seismically induced settlements are presented in Appendix D.

Seismically Induced Flooding

According to City of Ontario General Plan (2010), the site is located in the potential inundation area of San Antonio Dam.

Seismically Induced Landsliding

Due to the low gradient of the site, the potential for seismically induced landsliding is nil. This assumes that any slopes created during development of the site will be properly designed and constructed. It should be noted that the California Geological Survey has not yet prepared a Seismic Hazard Zone Map of potential earthquake-induced landslide hazards for the quadrangle in which the site is located.

3.11 Foundations

Isolated spread footings and/or continuous wall footings are recommended to support the proposed structures. If the recommendations in the section on grading are followed and footings are established in firm native soils or compacted fill materials, footings may be designed using the following allowable soil bearing values:

- Continuous Wall Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 2,000 pounds per square foot (psf). This value may be increased by 10% for each additional foot of width and/or depth to a maximum value of 3,500 psf.

- Isolated Spread Footings:

  Footings having a minimum width of 12 inches and a minimum depth of 12 inches below the lowest adjacent grade have allowable bearing capacity of 2,000 psf. This value may be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf.

- Retaining Wall Footings:

  Footings for retaining walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. However, when calculating passive resistance, the upper 6 inches of the footings should be ignored in areas where the footings will not be covered with concrete flatwork. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,000 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

- Sitework Element Footings:

  Footings for sitework elements (i.e. seat walls, planters, site/screening walls not retaining soil, and ball walls should be founded a minimum depth of 12 inches and have a minimum width of 12 inches. Footings may be designed using the allowable bearing capacity and lateral resistance values recommended for building footings. This value may also be increased by 10% for each additional foot of width or depth to a maximum value of 3,500 psf. Reinforcement should be provided for structural considerations as determined by the design engineer.

- Lateral Earth Resistance for Pole Foundations:

  Lateral bearing pressures of 150 psf/ft below design grade may be used.

Construction

Exploratory borings drilled for this investigation were advanced using continuous augers. Therefore, there is no indication as to the amount of caving that should be anticipated. However, caving of granular soils would be expected to occur during installation of pole foundations. It should be cautioned that the diameter of the piles may vary along their lengths possibly due to over-drilling or soil caving during construction. The contractor should be prepared to employ proper equipment for successful drilling. The contractor shall be prepared to employ temporary casing at his discretion, or to utilize other methods of advancing the pole foundations or other temporary shoring elements, to mitigate the potential of soil caving. Excavations should not be allowed to stand open overnight; excavations should be poured as soon as possible after inspection. The actual required depths should be field verified by the project geotechnical engineer or his representative.

- Musco Lighting Pole Foundations:

  The following may be used for pier/pole foundation recommendations for Musco Lighting light poles:

Allowable skin friction / vertical bearing pressure: 500psf

The allowable lateral bearing pressure shall be taken as 150 psf/ft with allowable increase of 50% for depths greater than 12 feet.

The effective width for lateral bearing pressure will be 3 times the diameter of the pier footing.

The minimum distance of the pole foundations from the adjacent building shall be no less than 3 times the diameter of the pole foundation to prevent surcharging the adjacent building foundations. If this minimum distance cannot be maintained, then the design shall neglect the passive pressure to a depth equal to 3 times the diameter of the pile below the ground surface.

There are no requirements for casing during construction. Groundwater was not encountered in our borings and not expected during excavation for the pole foundation.

The above bearing capacities represent an allowable net increase in soil pressure over existing soil pressure and may be increased by one-third for short-term wind or seismic loads. The maximum expected settlement of footings designed with the recommended allowable bearing capacity is expected to be on the order of ½ inch with differential settlement on the order of ¼ inch.

3.12 Foundation Setbacks from Slopes

Setbacks for footings adjacent to slopes should conform to the requirements of the California Building Code. Specifically, footings should maintain a horizontal distance or setback between any adjacent slope face and the bottom outer edge of the footing.

For slopes descending away from the foundation, the horizontal distance may be calculated by using h/3, where h is the height of the slope. The horizontal setback should not be less than 5 feet, nor need not be greater than 40 feet per the California Building Code. Where structures encroach within the zone of h/3 from the top of the slope the setback may be maintained by deepening the foundations. Flatwork and utilities within the zone of h/3 from the top of slope may be subject to lateral distortion caused by gradual downslope creep. Walls, fences and landscaping improvements constructed at the top of descending slopes should be designed with consideration of the potential for gradual downslope creep.

For ascending slopes, the horizontal setback required may be calculated by using h/2 where h is the height of the slope. The horizontal setback need not be greater than 15 feet per the California Building Code.

3.13 Slabs on Grade

We recommend the use of unreinforced slabs on grade for structures. These floor slabs should have a minimum thickness of 4 inches and should be divided into squares or rectangles using weakened plane joints (contraction joints), each with maximum dimensions not exceeding 15 feet. Contraction joints should be made in accordance with American Concrete Institute (ACI) guidelines. If weakened plane joints are not used, then the slabs shall be reinforced with at a minimum 6x6-10/10 welded wire fabric placed at mid-height of the slab. The project structural engineer may require additional reinforcement.

If heavy concentrated or moving loads are anticipated, slabs should be designed using a modulus of subgrade reaction (k) of 150psi/in when soils are prepared in conformance with the grading recommendations contained within the report.

Special care should be taken on floors slabs to be covered with thin-set tile or other inflexible coverings. These areas may be reinforced with 6x6-10/10 welded wire fabric placed at mid-height of the slab, to mitigate drying shrinkage cracks. Alternatively, inflexible flooring may be installed with unbonded fabric or liners to prevent reflection of slab cracks through the flooring.

A moisture vapor retarder/barrier is recommended beneath all slabs-on-grade that will be covered by moisture-sensitive flooring materials such as vinyl, linoleum, wood, carpet, rubber, rubber-backed carpet, tile, impermeable floor coatings, adhesives, or where moisture-sensitive equipment, products, or environments will exist. We recommend that design and construction of the vapor retarder or barrier conform to Section 1805 of the 2019 California Building Code (CBC) and pertinent sections of American Concrete Institute (ACI) guidance documents 302.1R-04, 302.2R-06 and 360R-10.

The moisture vapor retarder/barrier should consist of a minimum 10 mils thick polyethylene with a maximum perm rating of 0.3 in accordance with ASTM E 1745. Seams in the moisture vapor retarder/barrier should be overlapped no less than 6 inches or in accordance with the manufacturer's recommendations. Joints and penetrations should be sealed with the manufacturer's recommended adhesives, pressure-sensitive tape, or both. The contractor must avoid damaging or puncturing the vapor retarder/barrier and repair any punctures with additional polyethylene properly lapped and sealed.

ACI guidelines allow for the placement of moisture vapor retarder/barriers either directly beneath floor slabs or below an intermediate granular soil layer.

Placing the moisture retarder/barrier directly beneath the floor slab will provide improved curing of the slab bottom and will eliminate potential problems caused by water being trapped in a granular fill layer. Concrete slabs poured directly on a vapor retarder/barrier can experience shrinkage cracking and curling due to differential rates of curing through the thickness of the slab. Therefore, for concrete placed directly on the vapor retarded, we recommend a maximum water cement ratio of 0.45 and the use of water-reducing admixtures to increase workability and decrease bleeding.

If granular soil is placed over the vapor retarder/barrier, we recommend that the layer be at least 2 inches thick in accordance with traditional practice in southern California. Granular fill should consist of clean fine graded materials with 10 to 30% passing the No. 100 sieve and free from clay or silt. The granular layer should be uniformly compacted and trimmed to provide the full design thickness of the proposed slab. The granular fill layer should not be left exposed to rain or other sources of water such as wet-grinding, power washing, pipe leaks or other processes, and should be dry at the time of concrete placement. Granular fill layers that become saturated should be removed and replaced prior to concrete placement.

An additional layer of sand may be placed beneath the vapor retarder/barrier at the developer's discretion to minimize the potential of the retarder/barrier being punctured by underlying soils.

3.14 Miscellaneous Concrete Flatwork

Miscellaneous concrete flatwork and walkways may be designed with a minimum thickness of 4 inches. Large slabs should be reinforced with a minimum of 6x6-10/10 welded wire mesh placed at mid-height in the slab. Control joints should be constructed to create squares or rectangles with a maximum spacing of 15 feet.

Walkways may be constructed without reinforcement. Walkways should be separated from foundations with a thick expansion joint filler. Control joints should be constructed into non-reinforced walkways at a maximum of 5 feet spacing.

The subgrade soils beneath all miscellaneous concrete flatwork should be compacted to a minimum of 90 percent relative compaction for a minimum depth of 12 inches. The geotechnical engineer should monitor the compaction of the subgrade soils and perform testing to verify that proper compaction has been obtained.

3.15 Footing Excavation and Slab Preparations

All footing excavations should be observed by the geotechnical consultant to verify that they have been excavated into competent soils. The foundation excavations should be observed prior to the placement of forms, reinforcement steel, or concrete. These excavations should be evenly trimmed and level. Prior to concrete placement, any loose or soft soils should be removed. Excavated soils should not be placed on slab or footing areas unless properly compacted.

Prior to the placement of the moisture barrier and sand, the subgrade soils underlying the slab should be observed by the geotechnical consultant to verify that all under-slab utility trenches have been properly backfilled and compacted, that no loose or soft soils are present, and that the slab subgrade has been properly compacted to a minimum of 90 percent relative compaction within the upper 12 inches.

Footings may experience and overall loss in bearing capacity or an increased potential to settle where located in close proximity to existing or future utility trenches. Furthermore, stresses imposed by the footings on the utility lines may cause cracking, collapse and/or a loss of serviceability. To reduce this risk, footings should extend below a 1:1 plane projected upward from the closest bottom of the trench.

Slabs on grade and walkways should be brought to a minimum of 2% and a maximum of 6% above their optimum moisture content for a depth of 18 inches prior to the placement of concrete. The geotechnical consultant should perform insitu moisture tests to verify that the appropriate moisture content has been achieved a maximum of 24 hours prior to the placement of concrete or moisture barriers.

3.16 Lateral Load Resistance

Lateral loads may be resisted by soil friction and the passive resistance of the soil. The following parameters are recommended.

- Passive Earth Pressure = 500 pcf (equivalent fluid weight).
- Coefficient of Friction (soil to footing) = 0.48
- Retaining structures should be designed to resist the following lateral active earth pressures:

Surface Slope of Retained Materials (Horizontal:Vertical)	**Equivalent Fluid Weight (pcf)**
Level	30
5:1	32
4:1	33
3:1	35
2:1	41

These active earth pressures are only applicable if the retained earth is allowed to strain sufficiently to achieve the active state. The required minimum horizontal strain to achieve the active state is approximately 0.0025H. Retaining structures should be designed to resist an at-rest lateral earth pressure if this horizontal strain cannot be achieved.

- At-rest Lateral Earth Pressure = 50 pcf (equivalent fluid weight)

The Mononobe-Okabe method is commonly utilized for calculating seismically induced active and passive lateral earth pressures and is based on the limit equilibrium Coulomb theory for static stress conditions. This method entails three fundamental assumptions (e.g., Seed and Whitman, 1970): Wall movement is sufficient to ensure either active or passive conditions, the driving soil wedge inducing the lateral earth pressures is formed by a planar failure surface starting at the heel of the wall and extending to the free surface of the backfill, and the driving soil wedge and the retaining structure act as rigid bodies, and therefore, experiences uniform accelerations throughout the respective bodies (U.S. Army Corps of Engineers, 2003, Engineering and Design - Stability Analysis of Concrete Structures).

- Seismic Lateral Earth Pressure = 21 pcf (equivalent fluid weight).

The seismic lateral earth pressure given above is a triangle increasing with depth, and the resultant of this pressure is an increment of force which should be applied to the back of the wall at 1/3 of the wall height from the wall base. The seismic increment of earth pressure should be added to the static active earth pressure. Even for the at-rest (Ko) condition, the seismic increment of earth pressure should be added to the static active earth pressure, not to the at-rest static earth pressure (SEAOC Seismology Committee 2019).

Per 2022 CBC Section 1803.5.12 dynamic seismic lateral earth pressures shall be applied to foundation walls and retaining walls supporting more than 6 feet of backfill. Dynamic seismic lateral earth pressures may also be applied to shorter walls at the discretion of the structural engineer.

3.17 Drainage and Moisture Proofing

Surface drainage should be directed away from the proposed structure into suitable drainage devices. Neither excess irrigation nor rainwater should be allowed to collect or pond against building foundations or within low-lying or level areas of the lot. Surface waters should be diverted away from the tops of slopes and prevented from draining over the top of slopes and down the slope face.

Walls and portions thereof that retain soil and enclose interior spaces and floors below grade should be waterproofed and dampproofed in accordance with CBC Section 1805.

Retaining structures should be drained to prevent the accumulation of subsurface water behind the walls. Backdrains should be installed behind all retaining walls exceeding 3 feet in height. A typical detail for retaining wall back drains is presented in Appendix C. All backdrains should be outlet to suitable drainage devices. Retaining wall less than 3 feet in height should be provided with backdrains or weep holes. Dampproofing and/or waterproofing should also be provided on all retaining walls exceeding 3 feet in height.

3.18 Cement Type and Corrosion Potential

Soluble sulfate tests indicate that concrete at the subject site will have a negligible exposure to water-soluble sulfate in the soil. Our recommendations for concrete exposed to sulfate-containing soils are presented in the table below.

Recommendations for Concrete exposed to Sulfate-containing Soils

Sulfate Exposure	Water Soluble Sulfate (SO_4) in Soil (% by Weight)	Sulfate (SO_4) in Water (ppm)	Cement Type (ASTM C150)	Maximum Water-Cement Ratio (by Weight)	Minimum Compressive Strength (psi)
Negligible	0.00 - 0.10	0-150	--	--	2,500
Moderate	0.10 - 0.20	150-1,500	II	0.50	4,000
Severe	0.20 - 2.00	1,500-10,000	V	0.45	4,500
Very Severe	Over 2.00	Over 10,000	V plus pozzolan or slag	0.45	4,500

Use of alternate combinations of cementitious materials may be permitted if the combinations meet design recommendations contained in American Concrete Institute guideline ACI 318-11.

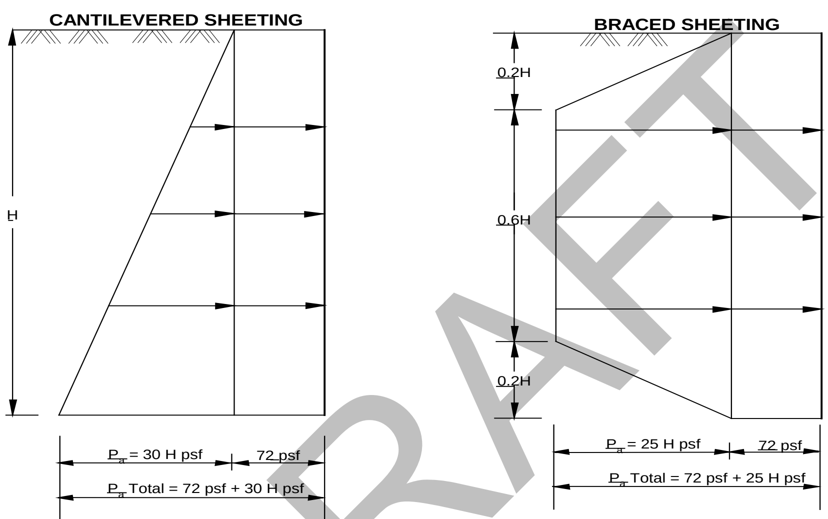
The soils were also tested for soil reactivity (pH), electrical resistivity (ohm-cm) and chloride content. The test results indicate that the on-site soils have a soil reactivity of 6.8, an electrical resistivity of 770 ohm-cm, and a chloride content of 153 ppm. Note that:

- A neutral or non-corrosive soil has a pH value ranging from 5.5 to 8.4.
- Generally, soils that could be considered moderately corrosive to ferrous metals have resistivity values of about 3,000 ohm-cm to 10,000 ohm-cm. Soils with resistivity values less than 3,000 ohm-cm can be considered corrosive and soils with resistivity values less than 1,000 ohm-cm can be considered extremely corrosive.
- Chloride contents of approximately 500 ppm or greater are generally considered corrosive.

Based on our analysis, it appears that the underlying onsite soils are corrosive to ferrous metals. Protection of buried pipes utilizing coatings on all underground pipes; clean backfills and a cathodic protection system can be effective in controlling corrosion. A qualified corrosion engineer may be consulted to further assess the corrosive properties of the soil.

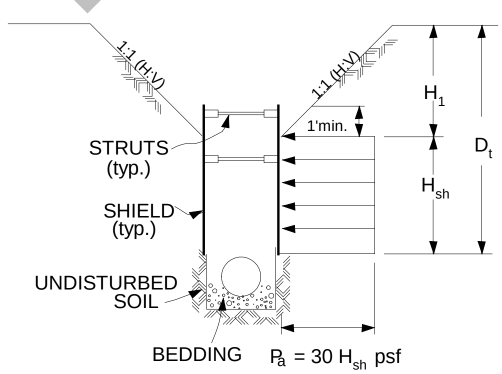
3.19 Temporary Slopes

Excavation of utility trenches will require either temporary sloped excavations or shoring. Temporary excavations in existing alluvial soils may be safely made at an inclination of 1:1 or flatter. If vertical sidewalls are required in excavations greater than 5 feet in depth, the use of cantilevered or braced shoring is recommended. Excavations less than 5 feet in depth may be constructed with vertical sidewalls without shoring or shielding. Our recommendations for lateral earth pressures to be used in the design of cantilevered and/or braced shoring are presented below. These values incorporate a uniform lateral pressure of 72 psf to provide for the normal construction loads imposed by vehicles, equipment, materials, and workmen on the surface adjacent to the trench excavation. However, if vehicles, equipment, materials, etc., are kept a minimum distance equal to the height of the excavation away from the edge of the excavation, this surcharge load need not be applied.



SHORING DESIGN: LATERAL SHORING PRESSURES

Design of the shield struts should be based on a value of 0.65 times the indicated pressure, Pa, for the approximate trench depth. The wales and sheeting can be designed for a value of 2/3 the design strut value.



HEIGHT OF SHIELD, H_{sh} = DEPTH OF TRENCH, D_t , MINUS DEPTH OF SLOPE, H_1

TYPICAL SHORING DETAIL

Placement of the shield may be made after the excavation is completed or driven down as the material is excavated from inside of the shield. If placed after the excavation, some overexcavation may be required to allow for the shield width and advancement of the shield. The shield may be placed at either the top or the bottom of the pipe zone. Due to the anticipated thinness of the shield walls, removal of the shield after construction should have negligible effects on the load factor of pipes. Shields may be successively placed with conventional trenching equipment.

Vehicles, equipment, materials, etc. should be set back away from the edge of temporary excavations a minimum distance of 15 feet from the top edge of the excavation. Surface waters should be diverted away from temporary excavations and prevented from draining over the top of the excavation and down the slope face. During periods of heavy rain, the slope face should be protected with sandbags to prevent drainage over the edge of the slope, and a visqueen liner placed on the slope face to prevent erosion of the slope face.

Periodic observations of the excavations should be made by the geotechnical consultant to verify that the soil conditions have not varied from those anticipated and to monitor the overall condition of the temporary excavations over time. If at any time during construction conditions are encountered which differ from those anticipated, the geotechnical consultant should be contacted and allowed to analyze the field conditions prior to commencing work within the excavation.

Cal/OSHA construction safety orders should be observed during all underground work.

3.20 Soil Infiltration Testing

Two soil infiltration tests were performed using the bore hole percolation test procedure described in the San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans (WQMP).

The testing was performed in 8-inch diameter borings that were drilled with a truck mounted CME-75 drill rig. The test holes extended to depths of 10 feet below the existing ground surface. The tests were performed in alluvial soil consisting of silty fine sand in Boring B-11 and sand with silt in Boring B-12, classified as SM and SP-SM, respectively, by the Unified Soil Classification System.

Prior to performing the tests, the auger used to drill the test holes was rotated until cuttings were removed from the hole. A 3-inch diameter perforated PVC pipe was then inserted into each test boring through the auger. A filter sock was installed around the pipe prior to placement in the boring in lieu of gravel or sand packing to prevent siltation in the pipe during testing and to facilitate removal of the pipe at the conclusion of the testing. Water levels were measured to the nearest 0.01 of a foot using an electronic well sounder. The test holes were presoaked for 60 minutes and water levels were measured every 30 minutes in B-11 and 10 minutes in B-12 because the initial water seeped away in less than 30 minutes. A total of 6 measurements were made following completion of presoaking.

Results of the testing are summarized in the table below.

Soil Infiltration Rates

Test No.	Depth (ft)	Soil Type	Infiltration Rate (in/hr)
P-1	10	SM	1.25
P-2	10	SP	13.25

Design of the infiltration systems should include an appropriate factor of safety to account for degradation of soil conditions by fine grained materials carried by runoff, potential growth of vegetation, accumulation of trash and other appropriate considerations. The factor of safety should be determined in accordance with the methodology presented in San Bernardino County Program – Technical Guidance Document for Water Quality Management Plans (Appendix D, Section VII) using a medium concern for the assessment method, low concerns for texture class (granular soils) and soil variability (relatively homogeneous soils), a low concern for groundwater (depth to groundwater greater than 100 feet), and appropriate design related considerations. Per the Technical Guidance Document, the factor a safety should not be less than 2. We recommend that the slowest field test rate (P-1, 1.25 in/hr) be used to determine the design rate. As discussed in Section 2.02, the sand layers encountered in some of our borings are most likely buried paleo-channels within the overall alluvial deposition pattern and are not continuous across the borings and are considered incongruous. Infiltration systems that are located within these paleo-channels may exhibit lowered infiltration rates as the wetted front encounters the prevalent silty fine sand.

The above rates apply to existing natural soils. Compaction of soils will reduce infiltration rates. Therefore soils at the bottom of the proposed infiltration systems should not be rolled or otherwise compacted, and construction traffic should not be allowed in the area where the infiltration systems will be constructed. A maintenance plan should also be developed and implemented to restore infiltration properties of soils that may be impacted by sedimentation or other adverse conditions.

The test data sheets for the soil infiltration tests are presented in Appendix A.

3.21 Utility Trench Backfill

The onsite fill soils will not be suitable for use as pipe bedding for buried utilities. All pipes should be bedded in a sand, gravel or crushed aggregate imported material complying with the requirements of the Standard Specifications for Public Works Construction Section 306-1.2.1. Crushed rock products that do not contain appreciable fines should not be utilized as pipe bedding and/or backfill. Bedding materials should be densified to at least 90% relative compaction (ASTM D1557) by mechanical methods. The geotechnical consultant should review and approve of proposed bedding materials prior to use.

All utility trench backfill within street right of way, utility easements, under or adjacent to sidewalks, driveways, or building pads should be observed and tested by the geotechnical consultant to verify proper compaction. Trenches excavated adjacent to foundations should not extend within the footing influence zone defined as the area within a line projected at a 1:1 drawn from the bottom edge of the footing. Trenches crossing perpendicular to foundations should be excavated and backfilled prior to the construction of the foundations. The excavations should be backfilled in the presence of the geotechnical engineer and tested to verify adequate compaction beneath the proposed footing.

Cal/OSHA construction safety orders should be observed during all underground work.

3.22 Pavement Sections

An R-value test was performed on the anticipated subgrade soil at the site in order to provide information on their soil properties for design of pavement structural sections. The R-value test was done in compliance with CTM-301. Structural sections were designed using the procedures outlined in Chapter 630 of the California Highway Design Manual (Caltrans, 2023) and the Caltrans Mechanistic-Emperical Tool program that utilizes an equivalent resilient modulus, traffic index and project climate to calculate asphalt pavement sections. This procedure uses the principle that the pavement structural section must be of adequate thickness to distribute the load from the design traffic index (TI) to the subgrade soils in such a manner that the stresses from the applied loads do not exceed the resilient modulus (M_r) of the soil.

Development of the design traffic indexes on the basis of a traffic study is beyond the scope of this report; however, our experience indicates that a traffic index of 5.0 is typical for automobile traffic lanes and parking and that a traffic index of 7.0 is typical for truck driving lanes and parking. We have provided alternate structural sections for each traffic index. Selection of the final pavement structural section should be based on economic considerations which are beyond the scope of this investigation. Recommended structural sections are as follows:

- Auto parking and minor streets (TI=5, R-Value=35 (M_r=20.5ksi)):
  4.0 inches of asphaltic concrete over
  4.5 inches of crushed aggregate base

- Truck and bus lanes and collector streets (TI=7, R-Value=35 (M_r=20.5ksi)):
  5.5 inches of asphaltic concrete over
  6.0 inches of crushed aggregate base

Portland cement concrete (PCC) pavements for areas which are not subject to traffic loads may be designed with a minimum thickness of 4.0 inches of Portland cement concrete on compacted non-expansive engineered fill soils. If traffic loads are anticipated, PCC pavements should be designed for a minimum thickness of 6.0 inches of Portland cement concrete on 12.0 inches of crushed aggregate base. Control joints to limit cracking of the concrete pavement should be spaced no more than 10 feet apart. According to ACI 330, reinforcement to control is not necessary when pavement is jointed to form short panel lengths of 15 feet or less. Reinforcement in the concrete paving will not add to the load carrying capacity of the concrete. Any reinforcement of concrete paving may be included in design as desired, to limit cracking of the concrete with at least number 4 reinforcing steel placed mid-height of the concrete at 18-inches on center typical.

Prior to paving, the subgrade soils should be scarified and the moisture adjusted to within 2% of the optimum moisture content. The subgrade soils should be compacted to a minimum of 90% relative compaction. All aggregate base courses should be compacted to a minimum of 95% relative compaction.

3.23 Plan Review

Once a formal grading and foundation plans are prepared for the subject property, this office should review the plans from a geotechnical viewpoint, comment on changes from the plan used during preparation of this report and revise the recommendations of this report where necessary.

3.24 Geotechnical Observation and Testing During Rough Grading

The geotechnical engineer should be contacted to provide observation and testing during the following stages of grading:

- During the clearing and grubbing of the site.
- During the demolition of any existing structures, buried utilities or other existing improvements.
- During excavation and overexcavation of compressible soils.

- During all phases of grading including ground preparation and filling operations.
- When any unusual conditions are encountered during grading.

A final geotechnical report summarizing conditions encountered during grading should be submitted upon completion of the rough grading operations.

3.25 Post-Grading Geotechnical Observation and Testing

After the completion of grading the geotechnical engineer should be contacted to provide additional observation and testing during the following construction activities:

- During trenching and backfilling operations of buried improvements and utilities to verify proper backfill and compaction of the utility trenches.
- After excavation and prior to placement of reinforcing steel or concrete within footing trenches to verify that footings are properly founded in competent materials.
- During fine or precise grading involving the placement of any fills underlying driveways, sidewalks, walkways, or other miscellaneous concrete flatwork to verify proper placement, mixing and compaction of fills.
- When any unusual conditions are encountered during construction.

4.00 Closure

The findings, conclusions and recommendations in this report were prepared in accordance with generally accepted engineering and geologic principles and practices. No other warranty, either expressed or implied, is made. This report has been prepared for City of Ontario to be used solely for design purposes. Anyone using this report for any other purpose must draw their own conclusions regarding required construction procedures and subsurface conditions.

The geotechnical and geologic consultant should be retained during the earthwork and foundation phases of construction to monitor compliance with the design concepts and recommendations and to provide additional recommendations as needed. Should subsurface conditions be encountered during construction that are different from those described in this report, this office should be notified immediately so that our recommendations may be re-evaluated.

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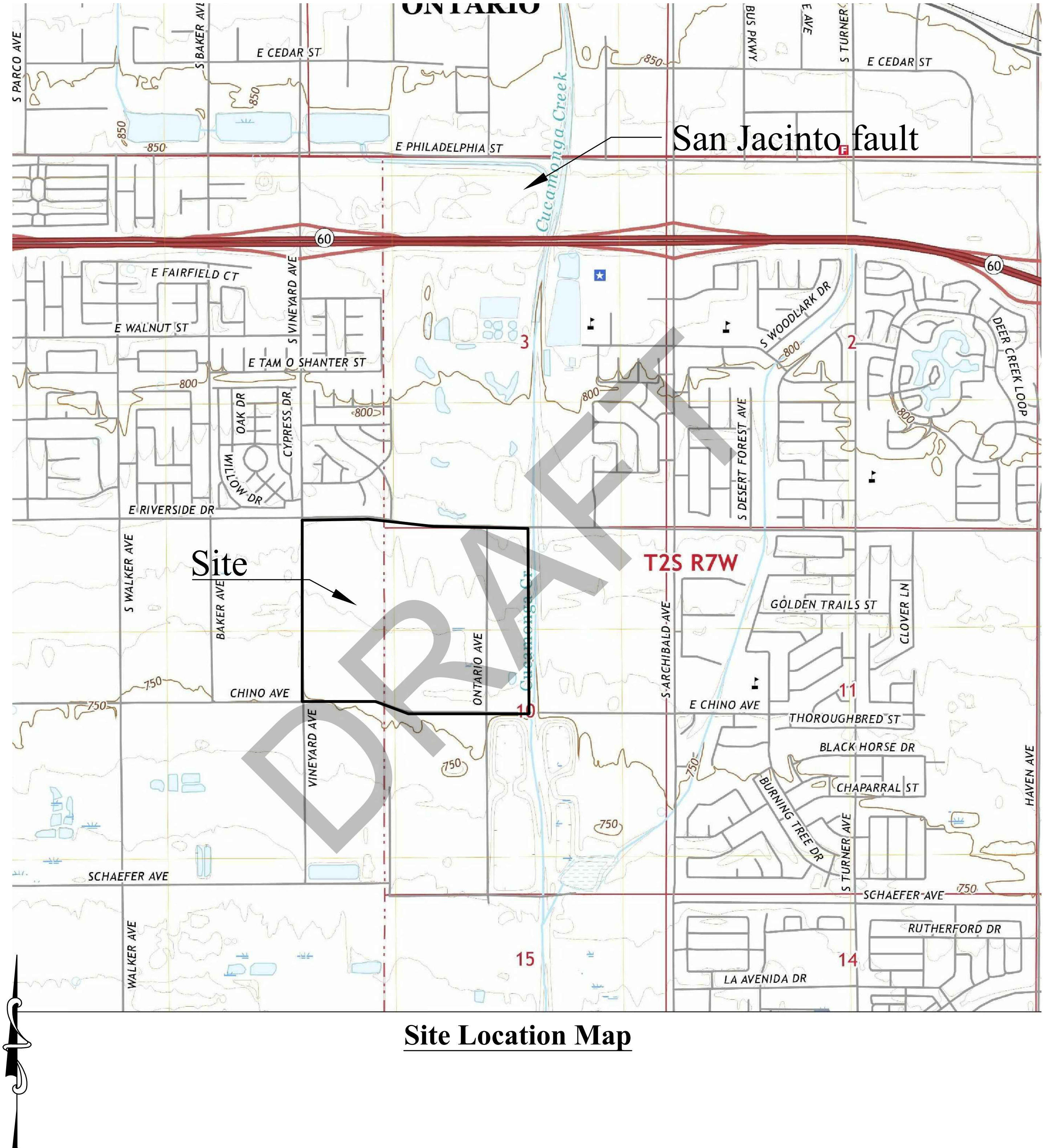
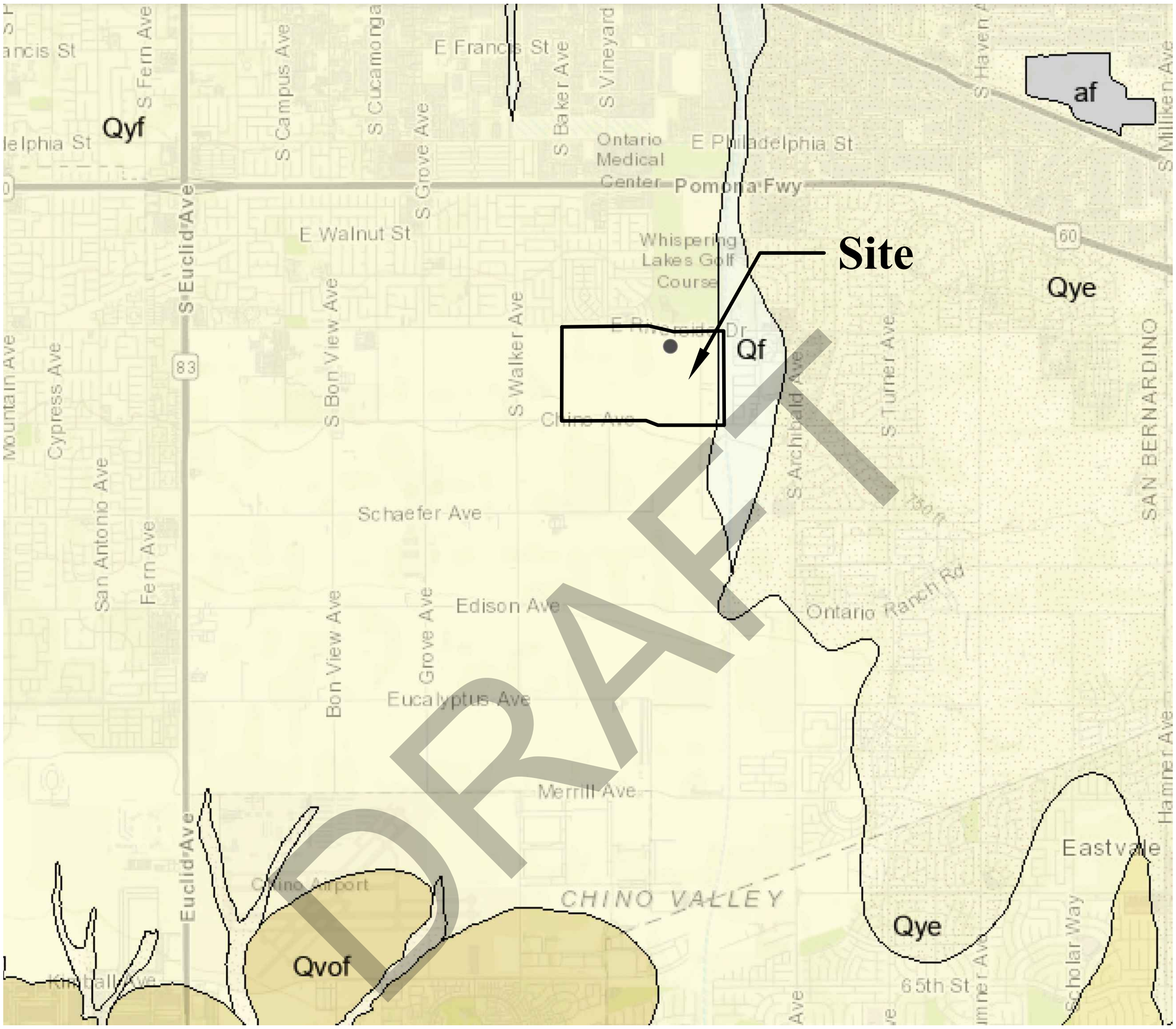
FIGURES AND TABLES



Site Location Map

Scale: 1"=2,000'

Base Map: USGS, 2021, Guast 7.5-minute Topographic Quadrangle



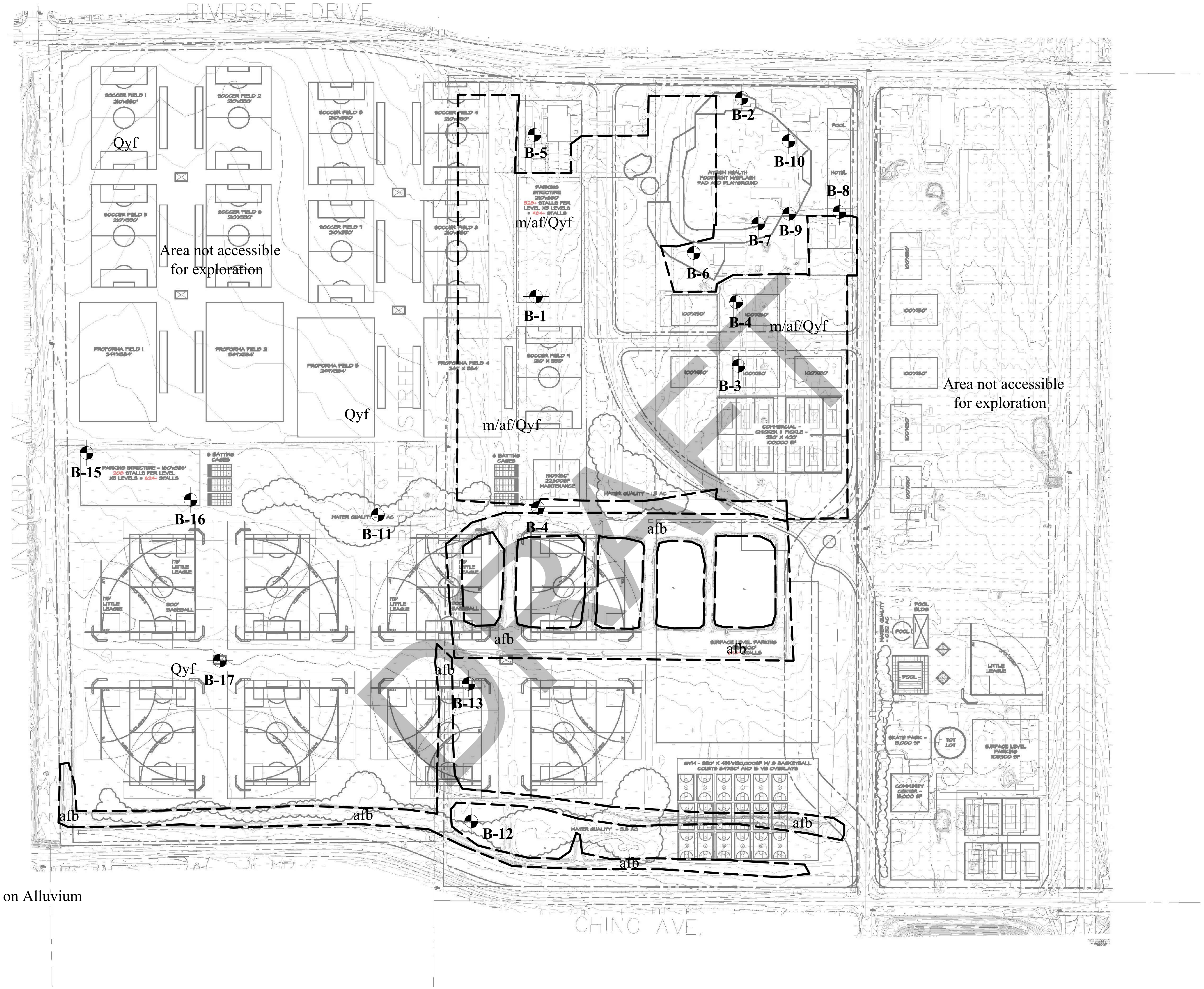
REGIONAL GEOLOGIC MAP

Partial Legend

af - Artificial Fill
Qye -Late Holocene Wash Deposits
Qyf - Holocene to Late Pleistocene Young Eolian and Dune Deposits
Qvof - Late to Middle Pleistocene Old Alluvial fan Deposits

Scale: 1"=3,000'

Source Map: Bedrossian, T.L., Hayhurst, C. A. and Roffers, P.D., 2010, Geologic Compilation of Quaternary Surficial Deposits in Southern California, San Bernardino 30' x 60' Quadrangle: California Geological Survey Special Report 217, Plate 13.



LEGEND

afb - Artificial fill (berm)

m/af/Qyf - Thin manure/Artificial fill on Alluvium

Qyf - Alluvium

- Boring Location

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GEOTECHNICAL ENGINEERING CONSTRUCTION INSPECTION MATERIALS TESTING

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DRAWN BY: DKR

DATE: October 2023

Ontario Sports Park

RMA JOB NO.: 00-232255-01

SHEET NO.: 1 OF 1

FIGURE NO.: 3

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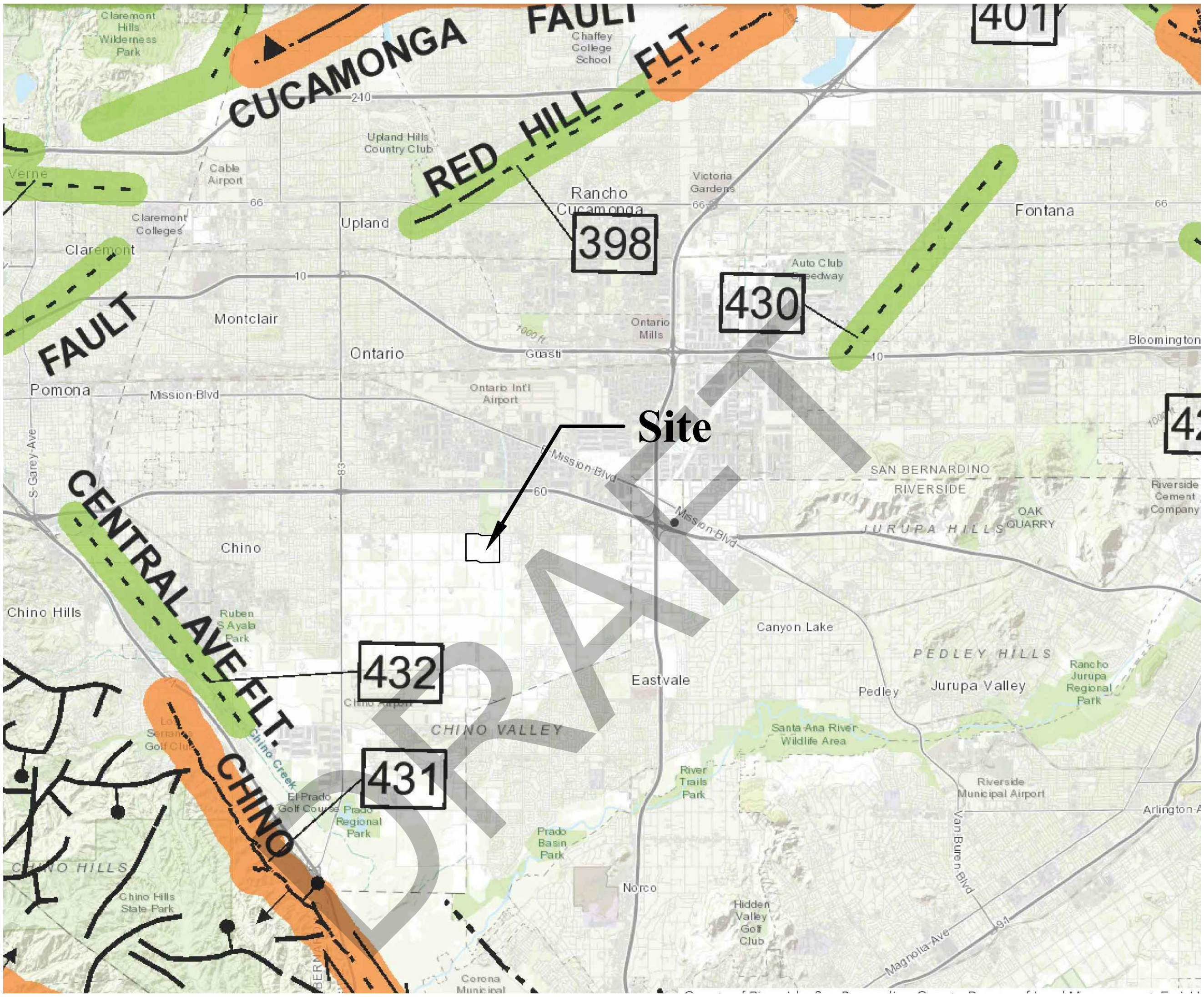

REGIONAL FAULT MAP

Scale: 1" ≈ 3 miles

Partial Legend

Orange - Holocene fault displacement

Green - Late Quaternary fault displacement

Purple - Quaternary fault

Black - Pre-Quaternary fault

Base Map: California Geological Survey Fault Activity Map of California, 2010

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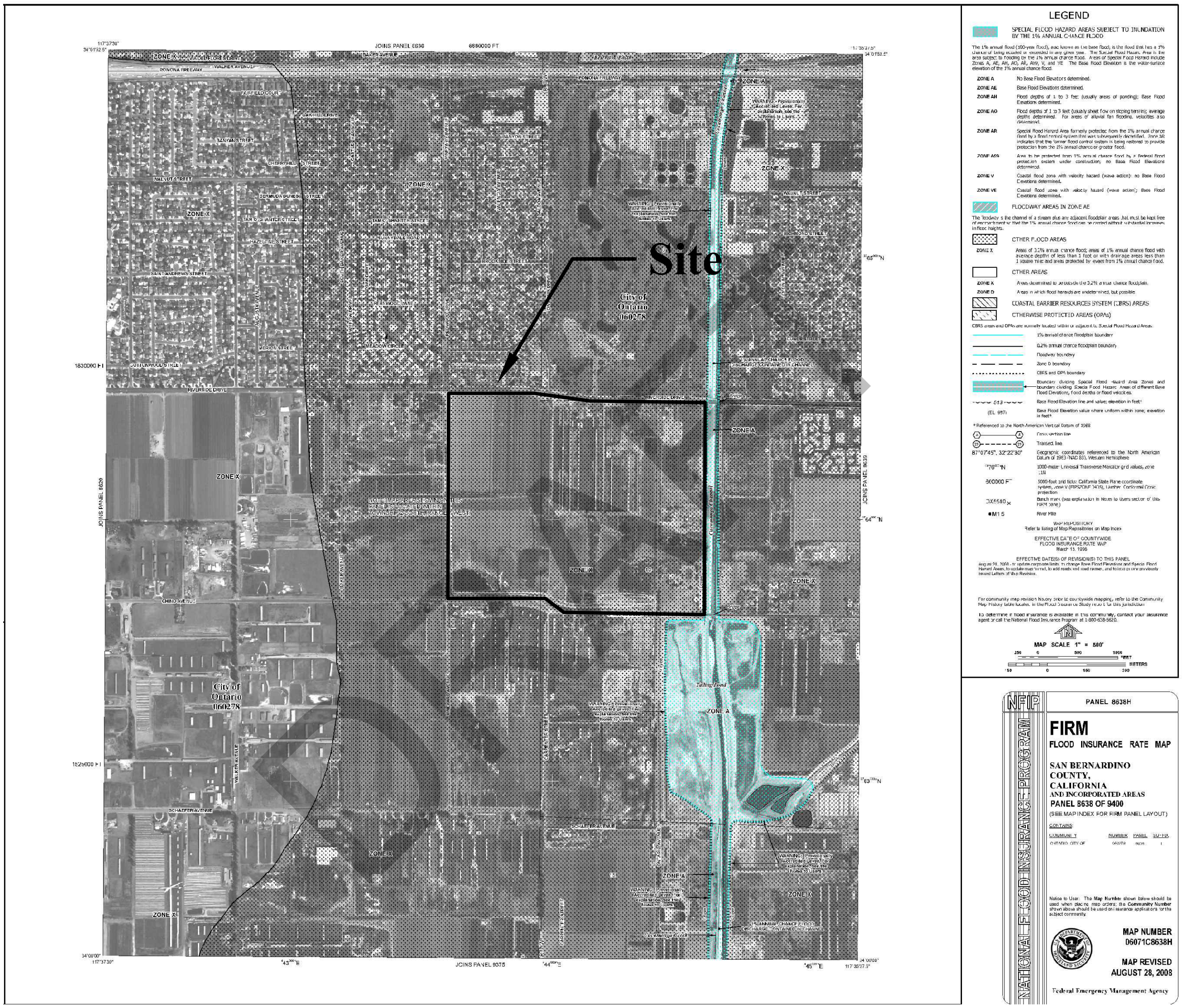

FEMA FLOOD ZONE MAP

NOTABLE FAULTS WITHIN 100 KILOMETERS AND SEISMIC DATA

Fault Zone & geometry	Distance (km)	Distance (mi.)	Maximum Moment Magnitude	Slip Rate (mm/yr)
Anacapa-Dume (r-ll-o)	88	55	7.5	3.0
Chino-Central Ave. (rl-r-o)	11	7	6.7	1.0
Clamshell-Sawpit (r)	33	21	6.5	0.5
Cleghorn (ll-ss)	35	22	6.5	3.0
Coronado Bank (rl-ss)	86	53	7.4	3.0
Cucamonga (r)	15	9	6.9	5.0
Elsinore - Temecula (rl-ss)	44	27	6.8	5.0
Elsinore - Glen Ivy (rl-ss)	19	12	6.8	5.0
Helendale - S Lockhart (rl-ss)	76	47	7.3	0.6
Hollywood (ll-r-o)	59	37	6.4	1.0
Holser (r)	98	61	6.5	0.4
Lenwood-Lockhart - Old Woman Spring	96	60	7.5	0.6
Malibu Coast (ll-r-o)	85	53	6.7	0.3
Newport-Inglewood (rl-ss)	52	32	6.9	1.5
Newport-Inglewood - Offshore (rl-ss)	55	34	7.1	1.5
North Frontal - Western (r)	45	28	7.2	1.0
North Frontal - Eastern (r)	82	51	6.7	0.5
Northridge (r)	78	48	7.0	1.5
Palos Verde (rl-ss)	67	42	7.3	3.0
Pinto Mountain (ll-ss)	82	51	7.2	2.5
Puente Hills Blind Thrust (r)	28	17	7.1	0.7
Raymond (ll-r-o)	39	24	6.5	1.5
San Andreas - Coachella (rl-ss)	38	24	7.2	25.0
San Andreas (rl-ss)	31	19	7.5	24.0
San Gabriel (rl-ss)	71	44	7.2	1.0
San Jacinto - San Jacinto Valley (rl-ss)	34	21	6.9	12.0
San Jacinto - San Bernardino (rl-ss)	26	16	6.7	12.0
San Joaquin Hills (r)	42	26	6.6	0.5
San Jose (ll-r-o)	13	8	6.4	0.5
Santa Monica (ll-r-o)	64	40	6.6	1.0
Sierra Madre (r)	17	11	7.2	2.0
San Fernando (r)	70	43	6.7	2.0
Upper Elysian Park (r)	46	29	6.4	1.3
Verdugo (r)	52	32	6.9	0.5

Notes:

Fault geometry - (ss) strike slip, (r) reverse, (n) normal, (rl) right lateral, (ll) left lateral, (o) oblique

Fault and Seismic Data - California Geological Survey (Cao), 2003

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HISTORIC STRONG EARTHQUAKES IN SOUTHERN CALIFORNIA SINCE 1812

Date	Event	Causitive Fault	Magnitude	Epicentral Distance (miles)
Dec. 12, 1812	Wrightwood	San Andreas?	7.3	28
Jan. 9, 1857	Fort Tejon	San Andreas	7.9	242
Dec. 16, 1858	San Bernardino Area	uncertain	6.0	18
Feb. 9,1890	San Jacinto	uncertain	6.3	88
May 28, 1892	San Jacinto	uncertain	6.3	88
July 30, 1894	Lytle Creek	uncertain	6.0	20
July 22, 1899	Cajon Pass	uncertain	6.4	21
Dec.25, 1899	San Jacinto	San Jacinto	6.7	39
Sept. 20, 1907	San Bernardino Area	uncertain	5.3	32
May 15, 1910	Elsinore	Elsinore	6.0	25
April 21, 1918	Hemet	San Jacinto	6.8	40
July 23, 1923	San Bernardino	San Jacinto	6.0	18
March 11, 1933	Long Beach	Newport-Inglewood	6.4	32
April 10, 1947	Manix	Manix	6.4	92
Dec. 4, 1948	Desert Hot Springs	San Andreas or Banning	6.5	72
July 21, 1952	Wheeler Ridge	White Wolf	7.3	108
Feb. 9, 1971	San Fernando	San Fernando	6.6	54
July 8, 1986	North Palm Springs	Banning or Garnet Hills	5.6	59
Oct. 1, 1987	Whittier Narrows	Puente Hills Thrust	6.0	28
Feb. 28, 1990	Upland	San Jose	5.5	10
June 28, 1991	Sierra Madre	Clamshell Sawpit	5.8	29
April 22, 1992	Joshua Tree	Eureka Peak	6.1	76
June 28, 1992	Landers	Johnson Valley & others	7.3	70
June 28, 1992	Big Bear	uncertain	6.5	47
Jan. 17, 1994	Northridge	Northridge Thrust	6.7	57
Oct. 16, 1999	Hector Mine	Lavic Lake	7.1	89
July 4, 2019	Searles Valley	Eastern Calif. Shear Zone	6.4	117
July 5, 2019	Searles Valley	Eastern Calif. Shear Zone	7.1	122

Notes:

Earthquake data: U.S. Geological Survey P.P. 1515 & online data, Southern California Earthquake Center & California Geological Survey online data

Magnitudes prior to 1932 are estimated from intensity.

Magnitudes after 1932 are moment, local or surface wave magnitudes.

Site Location:

Site Longitude: - 117.604962

Site Latitude: 34.01789

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APPENDIX A

FIELD INVESTIGATION

APPENDIX A

FIELD INVESTIGATION

A-1.00 FIELD EXPLORATION

A-1.01 Number of Borings

Our subsurface investigation consisted of 17 borings drilled with a CME-75 drill rig.

A-1.02 Location of Borings

A Site Geologic Map showing the approximate locations of the borings is presented as Figure 3.

A-1.03 Boring Logging

Logs of borings were prepared by one of our staff and are attached in this appendix. The logs contain factual information and interpretation of subsurface conditions between samples. The strata indicated on these logs represent the approximate boundary between earth units and the transition may be gradual. The logs show subsurface conditions at the dates and locations indicated, and may not be representative of subsurface conditions at other locations and times.

Identification of the soils encountered during the subsurface exploration was made using the field identification procedure of the Unified Soils Classification System (ASTM D2488). A legend indicating the symbols and definitions used in this classification system and a legend defining the terms used in describing the relative compaction, consistency or firmness of the soil are attached in this appendix. Bag samples of the major earth units were obtained for laboratory inspection and testing, and the in-place density of the various strata encountered in the exploration was determined

A-1.04 Soil Infiltration Testing

Two soil infiltration tests were performed using the boring percolation test procedure described in the San Bernardino County Stormwater Program Technical Guidance Document for Water Quality Management Plans (WQMP). Locations of the tests are shown on Figure 3.

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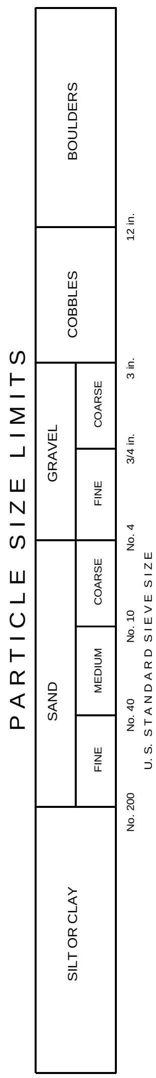

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of material is LARGER than No. 200 sieve size)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.	CLEAN GRAVELS (Little or no fines)	GW	Well graded gravel, gravel-sand mixtures. little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size)	CLEAN SANDS (Little or no 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 (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of material is SMALLER than No. 200 sieve size)	SILTS AND CLAYS (Liquid limit LESS than 50)		ML	Inorganic silts and very fine sands, rock flour silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50)		MH	Inorganic silts, micaceous or diatamaceous fine sandy or silty soils, 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 and other highly organic soils.

BOUNDARY CLASSIFICATIONS: Soils possessing characteristics of two groups are designated by combinations of group symbols.

Unified Soil Classification System

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I. SOIL STRENGTH/DENSITY

BASED ON STANDARD PENETRATION TESTS

Apparent Density of sand		Consistency of clay	
Penetration Resistance N (blows/Ft)	Apparent Density	Penetration Resistance N (blows/ft)	Consistency
0-4	Very Loose	<2	Very Soft
4-10	Loose	2-4	Soft
10-30	Medium Dense	4-8	Medium Stiff
30-50	Dense	8-15	Stiff
>50	Very Dense	15-30	Very Stiff
		>30	Hard

N = Number of blows of 140 lb. weight falling 30 in. to drive 2-in OD sampler 1 ft.

BASED ON RELATIVE COMPACTION

Compactness of sand		Consistency of clay	
% Compaction	Compactness	% Compaction	Consistency
<75	Loose	<80	Soft
75-83	Medium Dense	80-85	Medium Stiff
83-90	Dense	85-90	Stiff
>90	Very Dense	>90	Very Stiff

II. SOIL MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but not visible water
Wet	Visible free water, usually soil is below water table

SOIL DESCRIPTION LEGEND

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Exploratory Boring Log

Boring No. B-1

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
						SM		12" Manure on surface then concrete 3" Artificial fill (af): Gray silty fine to coarse sand, moist ,dense.
			Bulk			SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	12						Becomes brown in color
10	R	23						
								Trace of gravel
15	S	30		3.9				
20	S	77		4.5				
								Light brown to brown silty fine to coarse sand, trace gravel
25	S	69		4				
								Total depth 26.5' No groundwater Hole backfilled

Sample Types:

R - Ring Sample; Bulk Sample; Groundwater

T - Tube Sample; S - SPT Sample; End of Boring

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Exploratory Boring Log

Boring No. B-2

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	17		5.0				Becomes brown in color
10	R	55		5.0				Trace of gravel
			Bulk					Decrease in gravel
15	S	33		4.2				
20	S	50 for 6"		1.8				Trace to minor gravel
25	S	23		10.9				
								Gravel absent,silty fine to medium sand
								Trace of gravel, silty fine to coarse sand
	S	52		12.2				

Total depth 31.5'
No groundwater
Hole backfilled

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-2

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Young alluvial fan deposits (Qyf): Light brown to gray brown silty fine to medium sand, moist, non-porous, medium dense
5	R	50 for 6"		1.1				Becomes brown in color
10	R	58		8.4				Trace of gravel
			Bulk					Decrease in gravel
15	S	45		5.0				
20	S	54		6.5				Gravel absent, silty fine to medium sand and trace clay
25	S	65		17.4				Trace to minor grave, silty fine to coarse sand
30	S	85		6.8				

Total depth 31.5'
No groundwater
Hole backfilled

Sample Types:

R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-4

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		6 inches manure
								Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	72	Bulk	1.7				
10	R	55		9..9				Increase in gravel
15	S	44		4.5				Trace to minor gravel
20	S	58		10.1				
25	S	42		17.6				Gravel decreases ,silty fine to medium sand
	S	41		N/A				Total depth 31.5' No groundwater

Material Description note: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Sample Types:

R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-5

Sheet 1 of 3

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Geologic Map	Drive Weights:	140 lbs.
Elevation (ft):		Drop:	30"

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Sample Type	Blows (blows/ft)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		6 inches manure
								Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, dense
2–5			Bulk					
5	R	55		6.8				
10	R	45		4.8				Slight increase in gravel
12–15			Bulk					
15	S	34		4.4				Trace to minor gravel
20	S	32		7				
25	S	41		5.5				Gravel decreases ,silty fine to medium sand

Sample Types:

R - Ring Sample; Bulk Sample; - Groundwater

T - Tube Sample; S - SPT Sample; - End of Boring

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Exploratory Boring Log

Boring No. B-5

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Geologic Map	Drive Weights:	140 lbs.
Elevation (ft):		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	S	73		5.0		CL		Brown sandy clay, moist, slightly plastic, hard 57.8% passing #200
35	S	50 for 6"		4.8		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
40	S	82		5.7				
45	S	50-6"		10.7				17.3% passing #200
						SP-SM		Poorly graded fine to coarse sand with silt with trace to minor gravel, fine to medium sand, very dense, poorly sorted 7.3% passing #200
50	S	50-6"		15.5				Total depth 50.5' No groundwater Hole backfilled
55								

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Sample Types:

R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-5

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Geologic Map	Drive Weights:	140 lbs.
Elevation (ft):		Drop:	30"

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Artificial fill (af): Gray silty fine to coarse sand with gravel, moist ,dense.
1						SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, minor coarse sand, trace gravel, moist, non-porous, medium dense
2–4			Bulk					
5	R	21		3.8				
10	R	36		3.5				Increase in silt content and trace clay and gravel 24.1% passing #200
12–14			Bulk					
15	S	37		4.9				
20	S	36		N/A				Increase in gravel content, 32.0% (passing #200)
25	S	38		4.9				

Sample Types:

R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-6

Date Drilled: 09/21/2023
Logged By: SL
Location: See Geologic Map
Elevation (ft):

Drilling Equipment: CME-75
Boring Hole Diameter: 8"
Drive Weights: 140 lbs.
Drop: 30"

Depth (ft)	Sample Type	Blows (blows/ft)	Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
								This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
	S	27		5.0		CL		Brown sandy clay, moist, slightly plastic, hard 60.3% passing #200
						SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
35	S	38		13.7				
40	S	35		12.7				
45	S	43		10.5				
						CL		Brown sandy clay, moist, slightly plastic, hard 63.0% passing #200
50	S	28		21.5				
55	S	34		10.2				
						SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense

Sample Types:
R - Ring Sample
T - Tube Sample
- Bulk Sample
S - SPT Sample
- Groundwater
- End of Boring

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Exploratory Boring Log

Boring No. B-6

Date Drilled:	09/21/2023	Drilling Equipment:	CME -55
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Geologic Map	Drive Weights:	140 lbs.
Elevation (ft):		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
	S	34		21.5		SM		Brown silty fine to cvoarse sand with trace gravel, moist, poorly sorted, dense to very dense
65	S	41		10.2				
70	S	40		N/A				24.2% passing #200
75								
								Total depth 70.5' No groundwater Hole backfilled

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

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Sample Types:
R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-7

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
						SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	22		4.3				
10	R	21		10.2				
15	S	22		2.7				Increase in gravel, trace clay
20	S	26		11.2				
25	S	25		14.9				Gravel decreases ,silty fine to medium sand
	S	33						Total depth 31.5' No groundwater

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Sample Types:

R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-8

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to coarse sand, trace gravel, moist, non-porous, medium dense
5	R	17	Bulk	4.9				
10	R	24		12.1				Increase in gravel
15	S	24		2.9				
20	S	14		4.5				Gravel decreases ,silty fine to medium sand
25	S	29		12.3				
	S	24		11.2				Total depth 31.5' No groundwater

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

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Sample Types:

R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-9
Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to coarse sand, trace gravel, moist, non-porous, medium dense
5	R	13		4.9				
10	R	17		12.1				Increase in gravel
12–14.5			Bulk					
15	S	36		3.7				Dense
20	S	65		4.9				Gravel decreases ,silty fine to medium sand
24						ML		Brown sandy silt, moist, fine sand, stiff
25	S	15		13.0				
26.5								Total depth 26.5' No groundwater

Sample Types:
R - Ring Sample; Bulk Sample; Groundwater
T - Tube Sample; S - SPT Sample; End of Boring

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Exploratory Boring Log

Boring No. B-10
Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		3 inches asphalt Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist, non-porous, medium dense
5	R	17		4.7				
10	R	19		4.2				Silty fine to coarse sand
15	S	29		2.9				Coarse sand, dense
20	S	19		13.9				Trace to minor gravel
25	S	22		6.6		ML		Brown sandy silt, moist, fine sand, stiff
								Total depth 26.5' No groundwater

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Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-11

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Young alluvial fan deposits (Qyf): Light brown to brown silty fine to medium sand, trace gravel, moist
2–4.5			Bulk					
5	R	12						
7.5								Hit patch of gravel, pebble to cobble size, moist
10	R	18						Total depth 10.5' No groundwater
15								
20								
25								

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

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Sample Types:

R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-12
Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	12						
						SP-SM		Poorly graded fine to coarse sand with silt with trace gravel, fine to medium sand, medium dense, poorly sorted
10	R	15						Total depth 10.5' No groundwater
15								
20								
25								

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Sample Types:
R - Ring Sample
Bulk Sample
Groundwater
T - Tube Sample
S - SPT Sample
End of Boring

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Exploratory Boring Log

Boring No. B-13

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Material Description

This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
0						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						
10	R	32						Increase in medium to coarse sand
15	S	36						
								Sand with some pebble size gravel, course sand, moist, light brown to tan
20	S	47						
								Increase in silt and decrease in gravel
25	S	50-6"						Dark clay layer about 5' thick, Tan to brown, Moist
								Total depth 30.5' No groundwater

Sample Types:

- R - Ring Sample
- Bulk Sample
- Groundwater
- T - Tube Sample
- S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-14

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						
								Increase in medium to coarse sand
10	R	29						
15	S	57						
								Sand with some pebble size gravel, course sand, moist, light brown to tan
20	S	72						
								Course sand with silt, moist, light brown to tan
25	S	45						Total depth 25.5' No groundwater

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Sample Types:
- R - Ring Sample
- Bulk Sample
- Groundwater
- T - Tube Sample
- S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-15

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	11						
								Increase in medium to coarse sand
10	R	22						
								Increase in clay content with course to fine sand, dark brown, moist
15	S	44						
20	S	54						
25	S	37						Total depth 25.5' No groundwater

Material Description: This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.

Sample Types:

R - Ring Sample
Bulk Sample
- Groundwater
T - Tube Sample
S - SPT Sample
- End of Boring

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Exploratory Boring Log

Boring No. B-16

Sheet 1 of 1

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
								This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	S	14						
								Layer of 3'-4' with medium to coarse sand
10	S	27						
15	S	18						Increase in clay content with course to fine sand, dark brown, moist
20	S	29						Total depth 20.5' No groundwater
25								

Sample Types:

R - Ring Sample; Bulk Sample; Groundwater

T - Tube Sample; S - SPT Sample; End of Boring

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Exploratory Boring Log

Boring No. B-17

Date Drilled:	09/21/2023	Drilling Equipment:	CME-75
Logged By:	SL	Boring Hole Diameter:	8"
Location:	See Site Geologic Map	Drive Weights:	140 lbs.
		Drop:	30"

Depth (ft)	Samples: Sample Type	Samples: Blows (blows/ft)	Samples: Bulk Sample	Moisture Content (%)	Dry Density (pcf)	USCS	Graphic Symbol	Material Description
								This log contains factual information and interpretation of the subsurface conditions between the samples. The stratum indicated on this log represent the approximate boundary between earth units and the transition may be gradual. The log show subsurface conditions at the date and location indicated, and may not be representative of subsurface conditions at other locations and times.
						SM		Young alluvial fan deposits (Qyf): Light brown to brown fine to medium sand, trace gravel, moist
5	R	10						
10	R	18						Layer of 7-10' with medium to coarse sand
15	S	22						
20	S	37						Increase in clay content with course to fine sand, dark brown, moist
25	S	68						Total depth 25.5' No groundwater

Sample Types:

R - Ring Sample; Bulk Sample; Groundwater

T - Tube Sample; S - SPT Sample; End of Boring

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Percolation Test Data Sheet

Project:	Ontario MiLB Stadium		Project No.:	00-232255-0		Date:	10/16/2023
Test Hole No.:		P-1	Tested By:	SL			
Test Hole Depth (In.) , D_T:		120	USCS Soil Classification:		SM		
Test Hole Dimensions (inches)					Length	Width	
Diameter In.) if round=		8	Sides (if rectangular)=				
Sandy Soil Criteria*							
Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or equal to 6"? (y/n)
1	8:30 AM	9:00 AM	30	24.0	32.0	8.0	Y
2	9:00 AM	9:30 AM	30	24.0	30.4	6.4	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight.

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (In.)	D_f Final Depth to Water (In.)	ΔD Change in Water Level (In.)	Percolation Rate (min./in.)
1	9:40 AM	10:10 AM	30	12.0	48.2	36.2	0.829
2	10:10 AM	10:40 PM	30	48.2	72.1	23.9	1.258
3	10:40 AM	11:10 AM	30	72.1	84.2	12.2	2.469
4	11:10 AM	11:40 PM	30	84.2	94.8	10.6	2.830
5	11:50 AM	12:10 PM	30	84.3	94.7	10.4	2.885
6	12:10 PM	12:40:00 PM	30	84.6	94.7	10.1	2.970

Infiltration Rate (in/hr) = $(\Delta H*60min/hr*r)/\Delta t\ (r+2Havg)$

H avg = $(H_o - Hf)/2$

Infiltration Rate (in/hr): 1.25

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Percolation Test Data Sheet

Project:	Ontario MiLB Stadium		Project No.:	00-232576-2	Date:	10/13/2023
Test Hole No.:		P-2	Tested By:	SL		
Test Hole Depth (In.) , D_T:		120	USCS Soil Classification:	SP-SM		
Test Hole Dimensions (inches)				Length	Width	
Diameter In.) if round=		8	Sides (if rectangular)=			

Sandy Soil Criteria*

Trial No.	Start Time	Stop Time	Time Interval (min.)	Initial Depth to Water (in.)	Final Depth to Water (in.)	Change in Water Level (in.)	Greater than or equal to 6"? (y/n)
1	12:10 PM	12:40 PM	30	16.0	120.0	104.0	Y
2	12:45 PM	1:15 PM	30	16.0	120.0	104.0	Y

*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Otherwise, pre-soak (fill) overnight.

Trial No.	Start Time	Stop Time	Δt Time Interval (min.)	D_o Initial Depth to Water (In.)	D_f Final Depth to Water (In.)	ΔD Change in Water Level (In.)	Percolation Rate (min./in.)
1	12:30 PM	12:40 PM	10	12.0	86.4	74.4	0.134
2	12:45 PM	12:55 PM	10	12.0	93.0	81.0	0.123
3	1:00 PM	1:10 PM	10	12.0	90.4	78.4	0.128
4	1:15 PM	1:25 PM	10	12.0	90.2	78.2	0.128
5	1:25 PM	1:35 PM	10	12.0	90.1	78.1	0.128
6	1:35 PM	1:45 PM	10	12.0	89.8	77.8	0.129

COMMEN' Infiltration Rate (in/hr) = $(\Delta H*60min/hr*r)/\Delta t\ (r+2Havg)$

H avg = $(H_o - Hf)/2$

Infiltration Rate (in/hr): 13.24

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APPENDIX B

LABORATORY TESTS

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APPENDIX B

LABORATORY TESTS

B-1.00 LABORATORY TESTS

B-1.01 Maximum Density

Maximum density - optimum moisture relationships for the major soil types encountered during the field exploration were performed in the laboratory using the standard procedures of ASTM D1557.

B-1.02 Atterberg Limits

The liquid limit, plastic limit, and the plasticity index of the major soil types encountered in the test holes were determined using the standard test methods of ASTM D4318.

B-1.03 Expansion Tests

Expansion index tests were performed on representative samples of the major soil types encountered by the test methods outlined in ASTM D4829.

B-1.04 Soluble Sulfates and Chlorides

A test was performed on representative sample encountered during the investigation using the Caltrans Test Methods CTM 417 and CTM 422.

B-1.05 Sand Equivalence

Sand Equivalent tests were performed on representative samples of the major soil types encountered by the test methods of ASTM D2419.

B-1.06 Soil Reactivity (pH) and Electrical Resistivity

Representative soil sample was tested for soil reactivity (pH) and electrical resistivity using California Test Method 643. The pH measurement determines the degree of acidity or alkalinity in the soils.

B-1.07 Particle Size Analysis

Particle size analysis was performed on representative samples of the major soils types in accordance to the standard test methods of the ASTM D422. The hydrometer portion of the standard procedure was not performed and the material retained on the #200 screen was washed.

B-1.08 Direct Shear

Direct shear tests were performed on representative samples of the major soil types encountered in the test holes using the standard test method of ASTM D3080 (consolidated and drained). Tests were performed on remolded samples. Remolded samples were tested at 90 percent relative compaction.

Shear tests were performed on a direct shear machine of the strain-controlled type. To simulate possible adverse field conditions, the samples were saturated prior to shearing. Several samples were sheared at varying normal loads and the results plotted to establish the angle of the internal friction and cohesion of the tested samples.

B-1.09 Resistance Value (R-Value)

Resistance Value tests were performed on representative samples of the major soil types encountered by the test methods outlined in California 301.

B-1.10 Moisture Determination

Moisture content of the soil samples was performed in accordance to standard method for determination of water content of soil by drying oven, ASTM D2216. The mass of material remaining after oven drying is used as the mass of the solid particles.

B-1.11 Density of Split-Barrel Samples

Soil samples were obtained by using a split-barrel sampler in accordance to standard method of ASTM D1586.

B-1.12 Test Results

Test results for all laboratory tests performed on the subject project are presented in this appendix.

SAMPLE INFORMATION

Sample Number	Sample Description	Sample Location Boring No.	Sample Location Depth (ft)
1	Light brown silty sand	B-1	2-5 feet
2	Light brown silty sand	B-2	2-5 feet
3	Light brown silty sand	B-3	12-15 feet
4	Light brown silty sand	B-4	2-5 feet
5	Light brown silty sand	B-5	12-16 feet
7	Light brown silty sand	B-7	2-5 feet

MAXIMUM DENSITY - OPTIMUM MOISTURE

Test Method: ASTM D1557

Sample Number	Optimum Moisture (Percent)	Maximum Density (lbs/ft^3)
1	9.9	129.9
2	9.2	130.3
5	8.5	133.7

ATTERBERG LIMITS

Test Method: ASTM D4318

Sample Location	Liquid Limit	Plastic Index	Soil Classification
B-6 @ 50 feet	34	16	CL

EXPANSION TEST

Test Method: ASTM D4829

Sample Number	Molding Moisture Content (Percent)	Final Moisture Content (Percent)	Initial Dry Density (lbs/ft^3)	Expansion Index	Expansion Classification
1	7.5	15.1	117.6	4	Very low
7	6.2	14.8	118.3	2	Very low

<u>SOLUBLE SULFATES AND CHLORIDES</u>

Test Method: CTM 417 and CTM 422

Sample Number	Soluble Sulfate (% by weight)	Soluble Chloride (ppm)
3	0.0261	153

<u>SOIL REACTIVITY (pH) AND ELECTRICAL RESISTIVITY</u>

Test Method: CTM 643

Sample Number	pH	Resistivity (Ohm-cm)
3	6.8	770

<u>SAND EQUIVALENT</u>

Test Method: ASTM D2419

Sample Number	Sand Equivalent
2	19

<u>PERCENT PASSING #200 SIEVE</u>

Test Method: ASTM D422

Sample Location	Percent Passing #200 Sieve
B-1 @ 5 feet	37.6%
B-6 @10 feet	24.1%
B-6 @ 20 feet	32.0%
B-5 @ 30 feet	57.8%
B-5 @ 45 feet	17.3%
B-5 @ 50 feet	7.3%
B-6 @ 30 feet	60.3%
B-6 @ 50 feet	63.0%
B-6 @ 70 feet	24.2%

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PARTICLE SIZE ANALYSIS

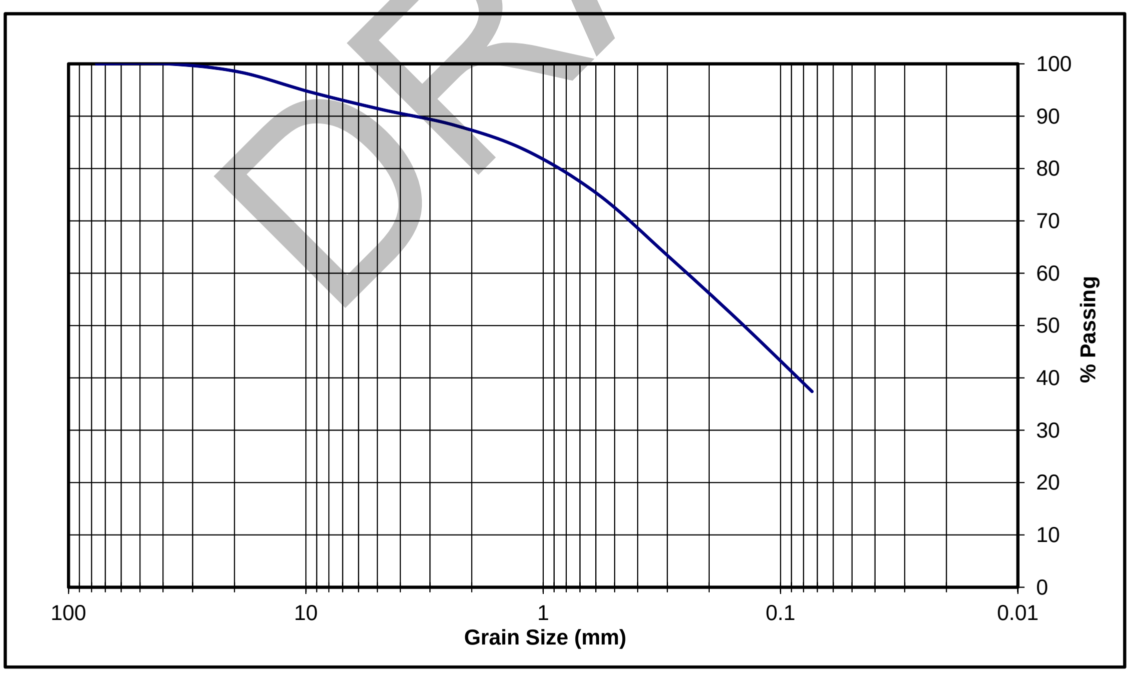
ASTM D422

Sample ID: 1
Location: B-1 @ 2-5 feet

Fraction A: Dry Net Weight (gms): 5,444
Fraction B: Dry Net Weight (gms): 486

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	5444	100
	1-1/2"	0	5444	100
	3/4"	85	5359	98
	3/8"	295	5149	95
	#4	477	4967	91

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	15.6	470.4	88
	#16	41.0	445.0	84
	#30	85.9	400.1	75
	#50	149.1	336.9	63
	#100	214.9	271.1	51
	#200	286.8	199.2	37



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PARTICLE SIZE ANALYSIS

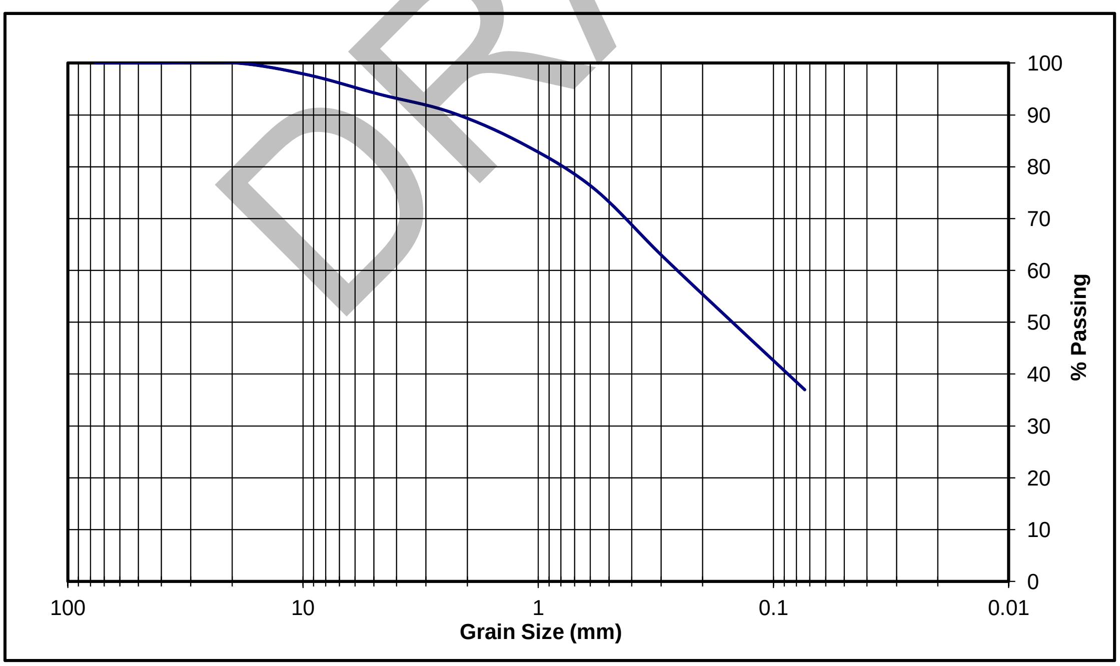
ASTM D422

Sample ID: 5
Location: B-5 @ 12-16 feet

Fraction A: Dry Net Weight (gms): 4,888
Fraction B: Dry Net Weight (gms): 523.8

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	4888	100
	1-1/2"	0	4888	100
	3/4"	0	4888	100
	3/8"	112	4776	98
	#4	294	4594	94

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	19.0	504.8	91
	#16	52.0	471.8	85
	#30	100.0	423.8	76
	#50	174.0	349.8	63
	#100	245.0	278.8	50
	#200	317.8	206.0	37



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PARTICLE SIZE ANALYSIS

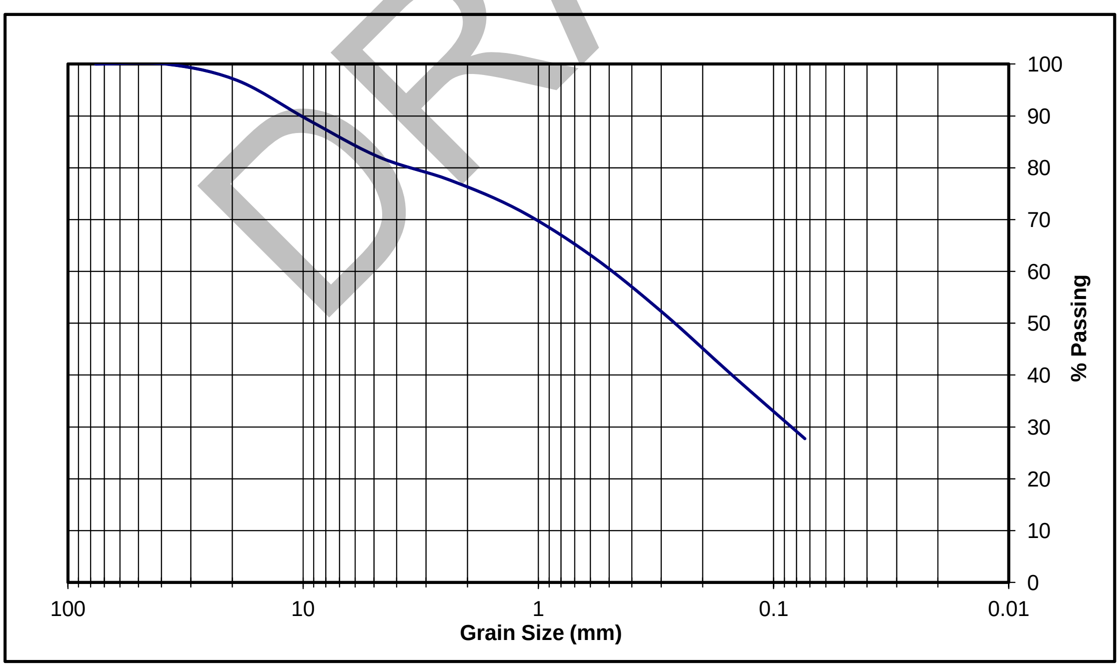
ASTM D422

Sample ID: 7
Location: B-7 @ 2-5 feet

Fraction A: Dry Net Weight (gms): 18,947
Fraction B: Dry Net Weight (gms): 508.4

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction A:	3"	0	18947	100
	1-1/2"	0	18947	100
	3/4"	597	18350	97
	3/8"	2036	16911	89
	#4	3400	15547	82

	Screen Size	Net Retained Weight (gms)	Net Passing Weight (gms)	% Passing
Fraction B:	#8	27.4	481.0	78
	#16	64.3	444.1	72
	#30	118.7	389.7	63
	#50	185.5	322.9	52
	#100	260.7	247.7	40
	#200	336.5	171.9	28



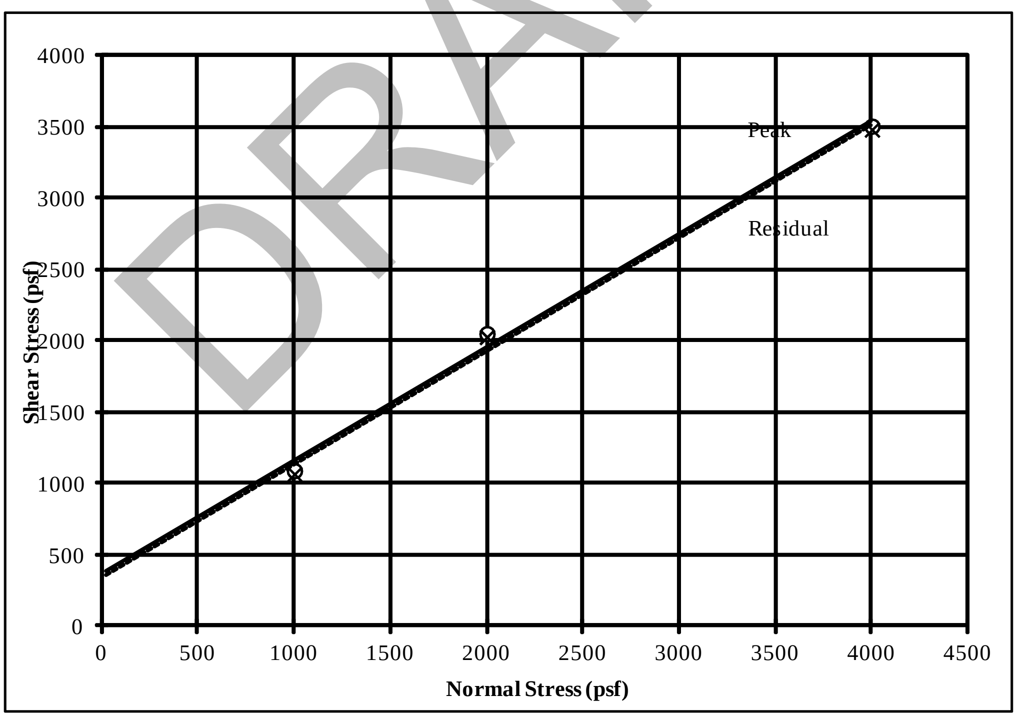
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 1

Maximum Dry Density (pcf) =	130.3
Optimum Moisture Content (%) =	9.2
Initial Dry Density (pcf) =	117.3
Initial Moisture Content (%) =	9.9
Final Moisture Content (%) =	14.6

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	1092	1068
2000	2052	2028
4000	3504	3480

	Peak	Residual
Cohesion (psf) =	370	340
Friction Angle (deg) =	38	38



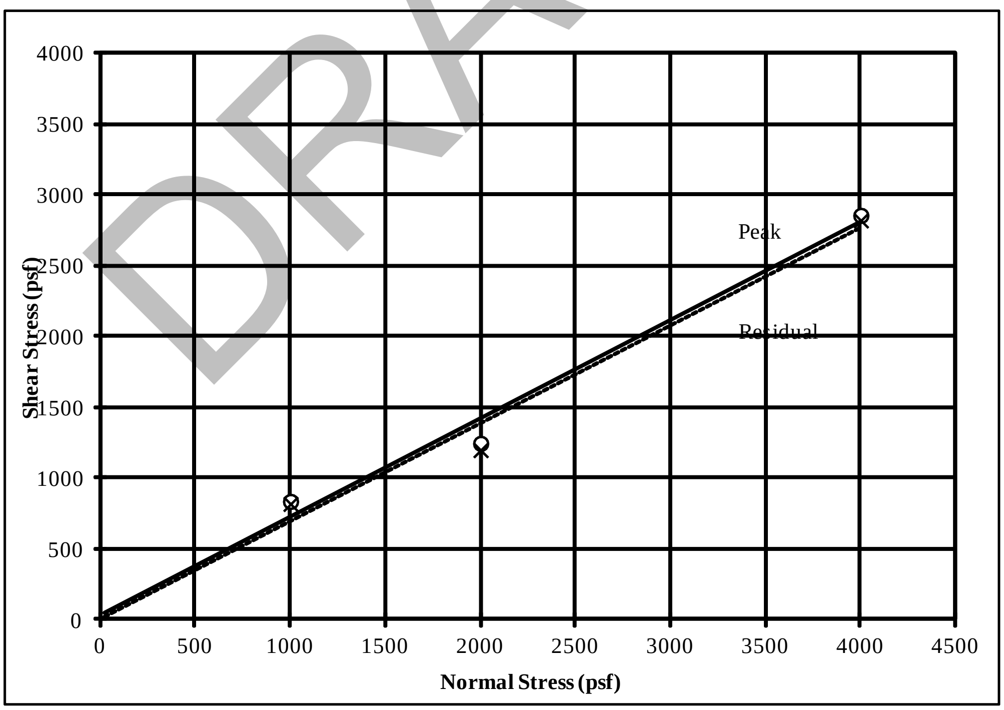
DIRECT SHEAR TEST
ASTM D3080

Sample ID: 5

Maximum Dry Density (pcf) =	133.7
Optimum Moisture Content (%) =	8.5
Initial Dry Density (pcf) =	120.3
Initial Moisture Content (%) =	8.6
Final Moisture Content (%) =	15.7

Normal Pressure	Peak Shear Resist	Residual Shear Resist
1000	838	820
2000	1248	1200
4000	2856	2820

	Peak	Residual
Cohesion (psf) =	30	10
Friction Angle (deg) =	35	34



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CTM 301 - DETERMINATION OF RESISTANCE "R" VALUE OF TREATED AND UNTREATED BASES, SUBBASES, AND BASEMENT SOILS BY THE STABILOMETER

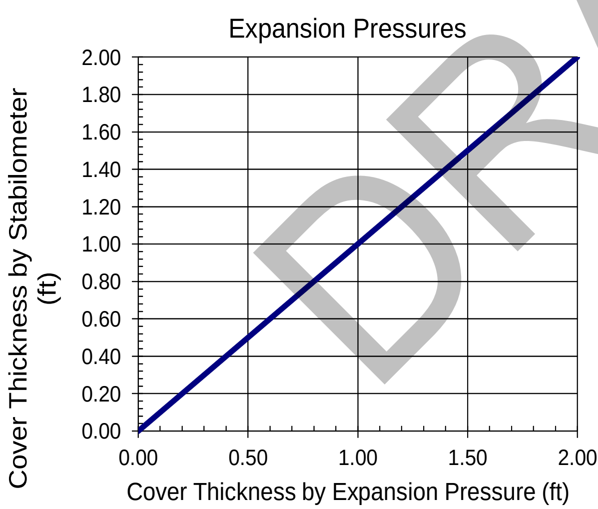
Sample ID: 1

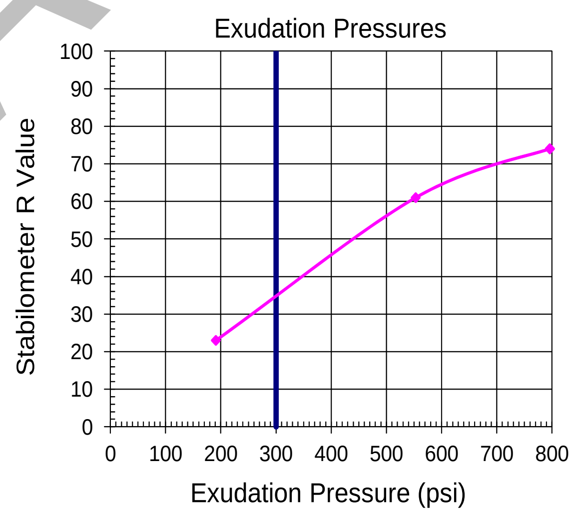
Specimen No	A	B	C
Moisture Content (%)	10.6	10.0	10.3
Dry Density (pcf)	120.0	120.0	119.5
Exudation Pressure (psi)	191	796	553
Stabilometer R Value	23	74	61
Expansion Pressure Dial	0	0	0

Use: Traffic Index = 6.0 Gravel Factor = 1.00

Thickness by Expansion (ft)			
Thickness by Stabilometer (ft)	1.48	0.50	0.75
Equilibrium Thick (ft)		-	
Equilibrium Pressure R Value		**n/a**	
Exudation Pressure R Value @ 300 psi		**35**	

Use Exudation R Value





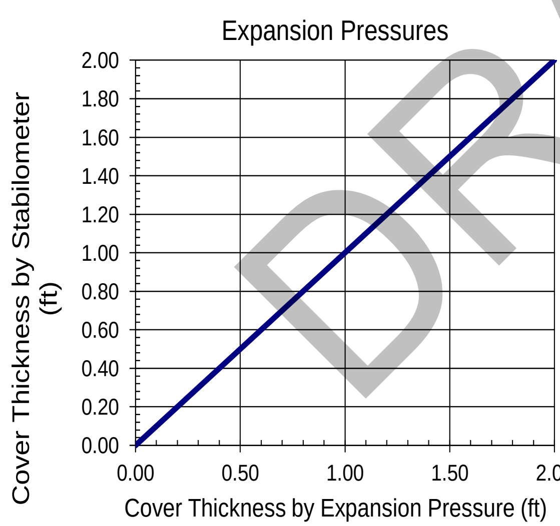
Expansion Pressure R-Value is based on the following structural section:

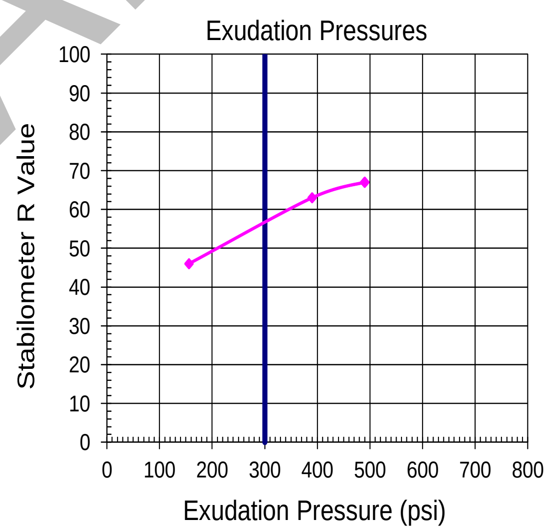
Thickness of AC (ft)=	**0.42**	G_f(ac) =	2.31	W(ac) =	145
Thickness of Aggregate Base (ft)=	**0.50**	G_f(base) =	1.10	W(base) =	130
		G_f(avg) =	1.65	W(avg) =	137

CTM 301 - DETERMINATION OF RESISTANCE "R" VALUE OF TREATED AND UNTREATED BASES, SUBBASES, AND BASEMENT SOILS BY THE STABILOMETER

Sample ID: 2

Specimen No	A	B	C
Moisture Content (%)	11.2	10.2	9.7
Dry Density (pcf)	119.7	121.6	122.3
Exudation Pressure (psi)	156	390	490
Stabilometer R Value	46	63	67
Expansion Pressure Dial	0	0	0
Use: Traffic Index = 6.0 Gravel Factor = 1.00			
Thickness by Expansion (ft)			
Thickness by Stabilometer (ft)	1.04	0.71	0.63
Equilibrium Thick (ft)		-	
Equilibrium Pressure R Value		**n/a**	
Exudation Pressure R Value @ 300 psi		**57**	***Use Exudation R Value***





Expansion Pressure R-Value is based on the following structural section:

Thickness of AC (ft)=	**0.42**	G_f(ac) =	2.31	W(ac) =	145
Thickness of Aggregate Base (ft)=	**0.50**	G_f(base) =	1.10	W(base) =	130
		G_f(avg) =	1.65	W(avg) =	137

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APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

APPENDIX C

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

C-1.00 GENERAL DESCRIPTION

C-1.01 Introduction

These specifications present our general recommendations for earthwork and grading as shown on the approved grading plans for the subject project. These specifications shall cover all clearing and grubbing, removal of existing structures, preparation of land to be filled, filling of the land, spreading, compaction and control of the fill, and all subsidiary work necessary to complete the grading of the filled areas to conform with the lines, grades and slopes as shown on the approved plans.

The recommendations contained in the geotechnical report of which these general specifications are a part of shall supersede the provisions contained hereinafter in case of conflict.

C-1.02 Laboratory Standard and Field Test Methods

The laboratory standard used to establish the maximum density and optimum moisture shall be ASTM D1557.

The insitu density of earth materials (field compaction tests) shall be determined by the sand cone method (ASTM D1556), direct transmission nuclear method (ASTM D6938) or other test methods as considered appropriate by the geotechnical consultant.

Relative compaction is defined, for purposes of these specifications, as the ratio of the in-place density to the maximum density as determined in the previously mentioned laboratory standard.

C-2.00 CLEARING

C-2.01 Surface Clearing

All structures marked for removal, timber, logs, trees, brush and other rubbish shall be removed and disposed of off the site. Any trees to be removed shall be pulled in such a manner so as to remove as much of the root system as possible.

C-2.02 Subsurface Removals

A thorough search should be made for possible underground storage tanks and/or septic tanks and cesspools. If found, tanks should be removed and cesspools pumped dry.

Any concrete irrigation lines shall be crushed in place and all metal underground lines shall be removed from the site.

C-2.03 Backfill of Cavities

All cavities created or exposed during clearing and grubbing operations or by previous use of the site shall be cleared of deleterious material and backfilled with native soils or other materials approved by the soil engineer. Said backfill shall be compacted to a minimum of 90% relative compaction.

C-3.00 ORIGINAL GROUND PREPARATION

C-3.01 Stripping of Vegetation

After the site has been properly cleared, all vegetation and topsoil containing the root systems of former vegetation shall be stripped from areas to be graded. Materials removed in this stripping process may be used as fill in areas designated by the soil engineer, provided the vegetation is mixed with a sufficient amount of soil to assure that no appreciable settlement or other detriment will occur due to decaying of the organic matter. Soil materials containing more than 3% organics shall not be used as structural fill.

C-3.02 Removals of Non-Engineered Fills

Any non-engineered fills encountered during grading shall be completely removed and the underlying ground shall be prepared in accordance to the recommendations for original ground preparation contained in this section. After cleansing of any organic matter the fill material may be used for engineered fill.

C-3.03 Overexcavation of Fill Areas

The existing ground in all areas determined to be satisfactory for the support of fills shall be scarified to a minimum depth of 6 inches. Scarification shall continue until the soils are broken down and free from lumps or clods and until the scarified zone is uniform. The moisture content of the scarified zone shall be adjusted to within 2% of optimum moisture. The scarified zone shall then be uniformly compacted to 90% relative compaction.

Where fill material is to be placed on ground with slopes steeper than 5:1 (H:V) the sloping ground shall be benched. The lowermost bench shall be a minimum of 15 feet wide, shall be a minimum of 2 feet deep, and shall expose firm material as determined by the geotechnical consultant. Other benches shall be excavated to firm material as determined by the geotechnical consultant and shall have a minimum width of 4 feet.

Existing ground that is determined to be unsatisfactory for the support of fills shall be overexcavated in accordance to the recommendations contained in the geotechnical report of which these general specifications are a part.

C-4.00 FILL MATERIALS

C-4.01 General

Materials for the fill shall be free from vegetable matter and other deleterious substances, shall not contain rocks or lumps of a greater dimension than is recommended by the geotechnical consultant, and shall be approved by the geotechnical consultant. Soils of poor gradation, expansion, or strength properties shall be placed in areas designated by the geotechnical consultant or shall be mixed with other soils providing satisfactory fill material.

C-4.02 Oversize Material

Oversize material, rock or other irreducible material with a maximum dimension greater than 12 inches, shall not be placed in fills, unless the location, materials, and disposal methods are specifically approved by the geotechnical consultant. Oversize material shall be placed in such a manner that nesting of oversize material does not occur and in such a manner that the oversize material is completely surrounded by fill material compacted to a minimum of 90% relative compaction. Oversize material shall not be placed within 10 feet of finished grade without the approval of the geotechnical consultant.

C-4.03 Import

Material imported to the site shall conform to the requirements of Section 4.01 of these specifications. Potential import material shall be approved by the geotechnical consultant prior to importation to the subject site.

C-5.00 PLACING AND SPREADING OF FILL

C-5.01 Fill Lifts

The selected fill material shall be placed in nearly horizontal layers which when compacted will not exceed approximately 6 inches in thickness. Thicker lifts may be placed if testing indicates the compaction procedures are such that the required compaction is being achieved and the geotechnical consultant approves their use.
Each layer shall be spread evenly and shall be thoroughly blade mixed during the spreading to insure uniformity of material in each layer.

C-5.02 Fill Moisture

When the moisture content of the fill material is below that recommended by the soils engineer, water shall then be added until he moisture content is as specified to assure thorough bonding during the compacting process.

When the moisture content of the fill material is above that recommended by the soils engineer, the fill material shall be aerated by blading or other satisfactory methods until the moisture content is as specified.

C-5.03 Fill Compaction

After each layer has been placed, mixed, and spread evenly, it shall be thoroughly compacted to not less than 90% relative compaction. Compaction shall be by sheepsfoot rollers, multiple-wheel pneumatic tired rollers, or other types approved by the soil engineer.

Rolling shall be accomplished while the fill material is at the specified moisture content. Rolling of each layer shall be continuous over its entire area and the roller shall make sufficient trips to insure that the desired density has been obtained.

C-5.04 Fill Slopes

Fill slopes shall be compacted by means of sheepsfoot rollers or other suitable equipment. Compacting of the slopes may be done progressively in increments of 3 to 4 feet in fill height. At the completion of grading, the slope face shall be compacted to a minimum of 90% relative compaction. This may require track rolling or rolling with a grid roller attached to a tractor mounted side-boom.

Slopes may be over filled and cut back in such a manner that the exposed slope faces are compacted to a minimum of 90% relative compaction.

The fill operation shall be continued in six inch (6") compacted layers, or as specified above, until the fill has been brought to the finished slopes and grades as shown on the accepted plans.

C-5.05 Compaction Testing

Field density tests shall be made by the geotechnical consultant of the compaction of each layer of fill. Density tests shall be made at locations selected by the geotechnical consultant.

Frequency of field density tests shall be not less than one test for each 2.0 feet of fill height and at least every one thousand cubic yards of fill. Where fill slopes exceed four feet in height their finished faces shall be tested at a frequency of one test for each 1000 square feet of slope face.

Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density reading shall be taken in the compacted material below the disturbed surface. When these readings indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked until the required density has been obtained.

C-6.00 SUBDRAINS

C-6.01 Subdrain Material

Subdrains shall be constructed of a minimum 4-inch diameter pipe encased in a suitable filter material. The subdrain pipe shall be Schedule 40 Acrylonitrile Butadiene Styrene (ABS) or Schedule 40 Polyvinyl Chloride Plastic (PVC) pipe or approved equivalent. Subdrain pipe shall be installed with perforations down. Filter material shall consist of 3/4" to 1 1/2" clean gravel wrapped in an envelope of filter fabric consisting of Mirafi 140N or approved equivalent.

C-6.02 Subdrain Installation

Subdrain systems, if required, shall be installed in approved ground to conform the approximate alignment and details shown on the plans or herein. The subdrain locations shall not be changed or modified without the approval of the geotechnical consultant. The geotechnical consultant may recommend and direct changes in the subdrain line, grade or material upon approval by the design civil engineer and the appropriate governmental agencies.

C-7.00 EXCAVATIONS

C-7.01 General

Excavations and cut slopes shall be examined by the geotechnical consultant. If determined necessary by the geotechnical consultant, further excavation or overexcavation and refilling of overexcavated areas shall be performed, and/or remedial grading of cut slopes shall be performed.

C-7.02 Fill-Over-Cut Slopes

Where fill-over-cut slopes are to be graded the cut portion of the slope shall be made and approved by the geotechnical consultant prior to placement of materials for construction of the fill portion of the slope.

C-8.00 TRENCH BACKFILL

C-.01 General

Trench backfill within street right of ways shall be compacted to 90% relative compaction as determined by the ASTM D1557 test method. Backfill may be jetted as a means of initial compaction; however, mechanical compaction will be required to obtain the required percentage of relative compaction. If trenches are jetted, there must be a suitable delay for drainage of excess water before mechanical compaction is applied.

C-9.00 SEASONAL LIMITS

C-9.01 General

No fill material shall be placed, spread or rolled while it is frozen or thawing or during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the soils engineer indicate that the moisture content and density of the fill are as previously specified.

C-10.00 SUPERVISION

C-10.01 Prior to Grading

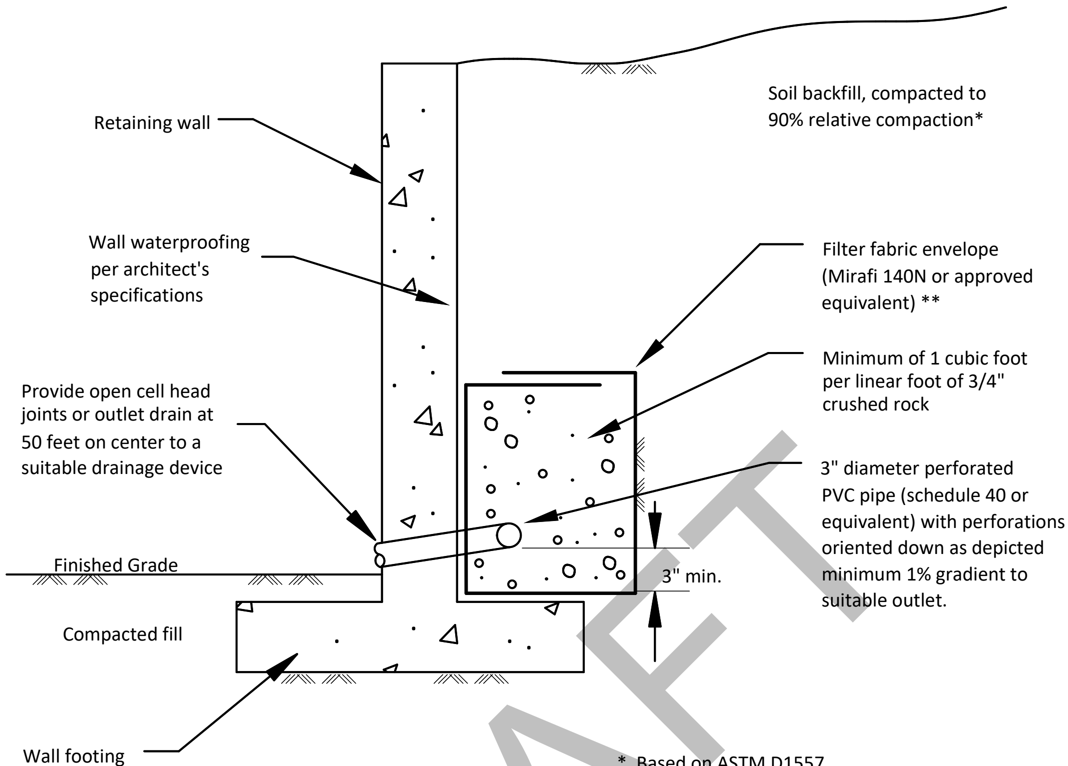
The site shall be observed by the geotechnical consultant upon completion of clearing and grubbing, prior to the preparation of any original ground for preparation of fill.

The supervisor of the grading contractor and the field representative of the geotechnical consultant shall have a meeting and discuss the geotechnical aspects of the earthwork prior to commencement of grading.

C-10.02 During Grading

Site preparation of all areas to receive fill shall be tested and approved by the geotechnical consultant prior to the placement of any fill.

The geotechnical consultant or his representative shall observe the fill and compaction operations so that he can provide an opinion regarding the conformance of the work to the recommendations contained in this report.



* Based on ASTM D1557

** If class 2 permeable material (See gradation to left) is used in place of 3/4" - 1 1/2" gravel. Filter fabric may be deleted. Class 2 permeable material compacted to 90% relative compaction. *

SPECIFICATIONS FOR CLASS 2 PERMEABLE MATERIAL (CAL TRANS SPECIFICATIONS)

Sieve Size	% Passing
1"	100
3/4"	90-100
3/8"	40-100
No.4	25-40
No.8	18-33
No.30	5-15
No.50	0-7
No.200	0-3

RETAINING WALL DRAINAGE DETAIL

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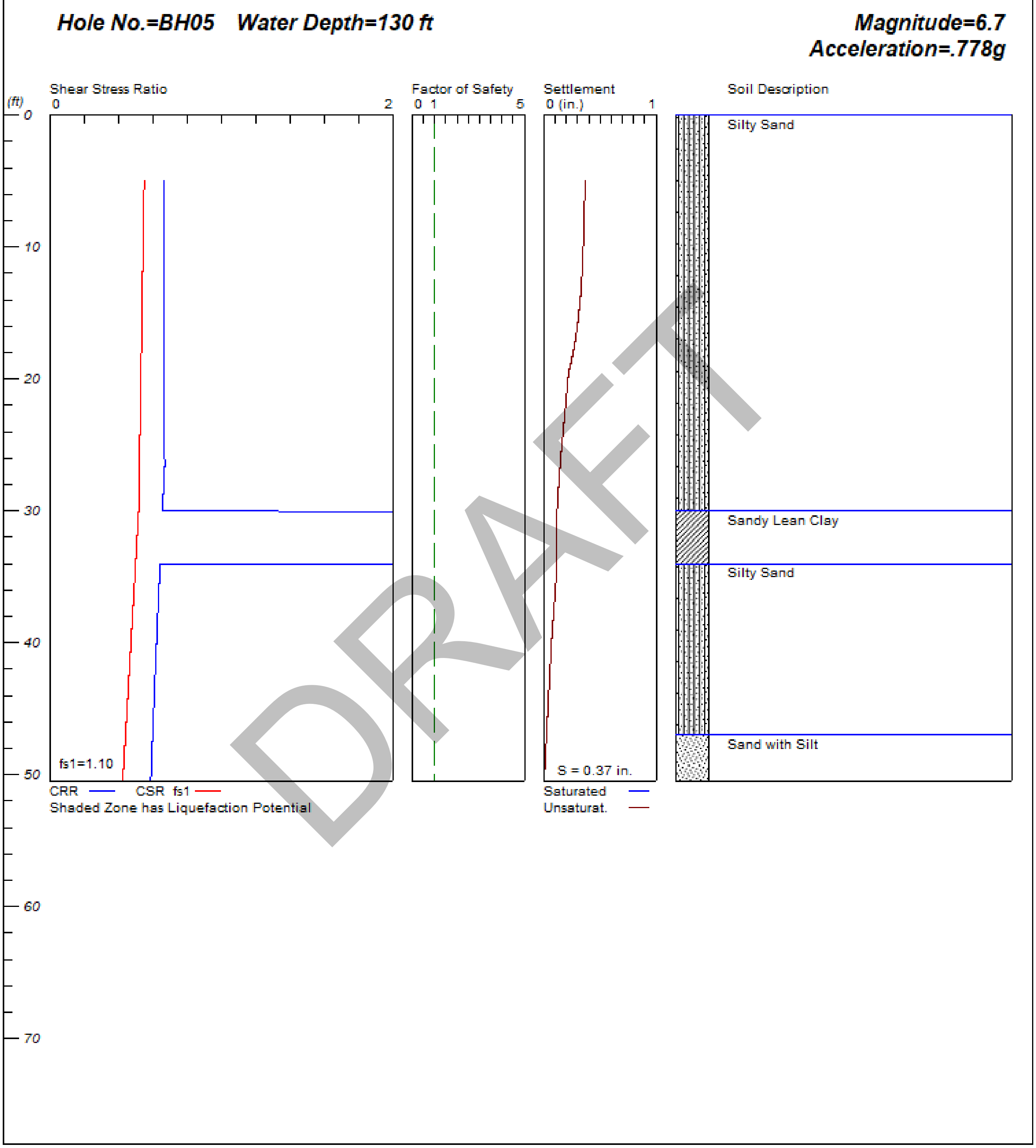
APPENDIX D

CALCULATIONS OF LIQUEFACTION POTENTIAL AND SEISMICALLY INDUCED SETTLEMENTS

LIQUEFACTION ANALYSIS

Ontario Sports Park



CivilTech Corporation

Plate A-1

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    Surface Elev.=
    Hole No.=BH05
    Depth of Hole= 50.50 ft
    Water Table during Earthquake= 130.00 ft
    Water Table during In-Situ Testing= 130.00 ft
    Max. Acceleration= 0.78 g
    Earthquake Magnitude= 6.70

 Input Data:
    Surface Elev.=
    Hole No.=BH05
    Depth of Hole=50.50 ft
    Water Table during Earthquake= 130.00 ft
    Water Table during In-Situ Testing= 130.00 ft
    Max. Acceleration=0.78 g
    Earthquake Magnitude=6.70
    No-Liquefiable Soils:   CL, OL are Non-Liq. Soil

    1. SPT or BPT Calculation.
    2. Settlement Analysis Method: Tokimatsu, M-correction
    3. Fines Correction for Liquefaction: Idriss/Seed
    4. Fine Correction for Settlement: During Liquefaction*
    5. Settlement Calculation in: All zones*
    6. Hammer Energy Ratio,                                 Ce = 1.25
    7. Borehole Diameter,                                       Cb= 1
    8. Sampling Method,                                        Cs= 1.2
    9. User request factor of safety (apply to CSR) ,   User= 1.1
       Plot one CSR curve (fs1=User)
    10. Use Curve Smoothing: Yes*
    * Recommended Options

    In-Situ Test Data:
```

Depth ft	SPT	gamma pcf	Fines %
5.00	55.00	125.00	12.00
10.00	45.00	125.00	12.00
15.00	34.00	125.00	12.00
20.00	32.00	125.00	12.00
25.00	41.00	125.00	12.00
30.00	73.00	110.00	NoLiq
35.00	100.00	125.00	17.30
40.00	82.00	125.00	17.30
45.00	100.00	125.00	17.30
50.00	100.00	125.00	7.30

```
Output Results:
    Settlement of Saturated Sands=0.00 in.
    Settlement of Unsaturated Sands=0.37 in.
    Total Settlement of Saturated and Unsaturated Sands=0.37 in.
    Differential Settlement=0.183 to 0.241 in.
```

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.67	0.55	5.00	0.00	0.37	0.37
5.05	0.67	0.55	5.00	0.00	0.36	0.36
5.10	0.67	0.55	5.00	0.00	0.36	0.36
5.15	0.67	0.55	5.00	0.00	0.36	0.36
5.20	0.67	0.55	5.00	0.00	0.36	0.36
5.25	0.67	0.55	5.00	0.00	0.36	0.36
5.30	0.67	0.55	5.00	0.00	0.36	0.36
5.35	0.67	0.55	5.00	0.00	0.36	0.36
5.40	0.67	0.55	5.00	0.00	0.36	0.36
5.45	0.67	0.55	5.00	0.00	0.36	0.36
5.50	0.67	0.55	5.00	0.00	0.36	0.36

5.55	0.67	0.55	5.00	0.00	0.36	0.36
5.60	0.67	0.55	5.00	0.00	0.36	0.36
5.65	0.67	0.55	5.00	0.00	0.36	0.36
5.70	0.67	0.55	5.00	0.00	0.36	0.36
5.75	0.67	0.55	5.00	0.00	0.36	0.36
5.80	0.67	0.55	5.00	0.00	0.36	0.36
5.85	0.67	0.55	5.00	0.00	0.36	0.36
5.90	0.67	0.55	5.00	0.00	0.36	0.36
5.95	0.67	0.55	5.00	0.00	0.36	0.36
6.00	0.67	0.55	5.00	0.00	0.36	0.36
6.05	0.67	0.55	5.00	0.00	0.36	0.36
6.10	0.67	0.55	5.00	0.00	0.36	0.36
6.15	0.67	0.55	5.00	0.00	0.36	0.36
6.20	0.67	0.55	5.00	0.00	0.36	0.36
6.25	0.67	0.55	5.00	0.00	0.36	0.36
6.30	0.67	0.55	5.00	0.00	0.36	0.36
6.35	0.67	0.55	5.00	0.00	0.36	0.36
6.40	0.67	0.55	5.00	0.00	0.36	0.36
6.45	0.67	0.55	5.00	0.00	0.36	0.36
6.50	0.67	0.55	5.00	0.00	0.36	0.36
6.55	0.67	0.55	5.00	0.00	0.36	0.36
6.60	0.67	0.55	5.00	0.00	0.36	0.36
6.65	0.67	0.55	5.00	0.00	0.36	0.36
6.70	0.67	0.55	5.00	0.00	0.36	0.36
6.75	0.67	0.55	5.00	0.00	0.36	0.36
6.80	0.67	0.55	5.00	0.00	0.36	0.36
6.85	0.67	0.55	5.00	0.00	0.36	0.36
6.90	0.67	0.55	5.00	0.00	0.36	0.36
6.95	0.67	0.55	5.00	0.00	0.36	0.36
7.00	0.67	0.55	5.00	0.00	0.36	0.36
7.05	0.67	0.55	5.00	0.00	0.36	0.36
7.10	0.67	0.55	5.00	0.00	0.36	0.36
7.15	0.67	0.55	5.00	0.00	0.36	0.36
7.20	0.67	0.55	5.00	0.00	0.36	0.36
7.25	0.67	0.55	5.00	0.00	0.36	0.36
7.30	0.67	0.55	5.00	0.00	0.36	0.36
7.35	0.67	0.55	5.00	0.00	0.36	0.36
7.40	0.67	0.55	5.00	0.00	0.36	0.36
7.45	0.67	0.55	5.00	0.00	0.36	0.36
7.50	0.67	0.55	5.00	0.00	0.36	0.36
7.55	0.67	0.55	5.00	0.00	0.36	0.36
7.60	0.67	0.55	5.00	0.00	0.36	0.36
7.65	0.67	0.55	5.00	0.00	0.36	0.36
7.70	0.67	0.55	5.00	0.00	0.36	0.36
7.75	0.67	0.55	5.00	0.00	0.36	0.36
7.80	0.67	0.55	5.00	0.00	0.36	0.36
7.85	0.67	0.55	5.00	0.00	0.36	0.36
7.90	0.67	0.55	5.00	0.00	0.36	0.36
7.95	0.67	0.55	5.00	0.00	0.36	0.36
8.00	0.67	0.55	5.00	0.00	0.36	0.36
8.05	0.67	0.55	5.00	0.00	0.36	0.36
8.10	0.67	0.55	5.00	0.00	0.36	0.36
8.15	0.67	0.55	5.00	0.00	0.36	0.36
8.20	0.67	0.55	5.00	0.00	0.36	0.36
8.25	0.67	0.55	5.00	0.00	0.36	0.36
8.30	0.67	0.55	5.00	0.00	0.36	0.36
8.35	0.67	0.55	5.00	0.00	0.36	0.36
8.40	0.67	0.55	5.00	0.00	0.36	0.36
8.45	0.67	0.55	5.00	0.00	0.36	0.36
8.50	0.67	0.55	5.00	0.00	0.36	0.36
8.55	0.67	0.55	5.00	0.00	0.35	0.35
8.60	0.67	0.55	5.00	0.00	0.35	0.35
8.65	0.67	0.55	5.00	0.00	0.35	0.35
8.70	0.67	0.54	5.00	0.00	0.35	0.35
8.75	0.67	0.54	5.00	0.00	0.35	0.35
8.80	0.67	0.54	5.00	0.00	0.35	0.35
8.85	0.67	0.54	5.00	0.00	0.35	0.35
8.90	0.67	0.54	5.00	0.00	0.35	0.35
8.95	0.67	0.54	5.00	0.00	0.35	0.35
9.00	0.67	0.54	5.00	0.00	0.35	0.35
9.05	0.67	0.54	5.00	0.00	0.35	0.35
9.10	0.67	0.54	5.00	0.00	0.35	0.35
9.15	0.67	0.54	5.00	0.00	0.35	0.35
9.20	0.67	0.54	5.00	0.00	0.35	0.35
9.25	0.67	0.54	5.00	0.00	0.35	0.35
9.30	0.67	0.54	5.00	0.00	0.35	0.35
9.35	0.67	0.54	5.00	0.00	0.35	0.35
9.40	0.67	0.54	5.00	0.00	0.35	0.35
9.45	0.67	0.54	5.00	0.00	0.35	0.35

9.50	0.67	0.54	5.00	0.00	0.35	0.35
9.55	0.67	0.54	5.00	0.00	0.35	0.35
9.60	0.67	0.54	5.00	0.00	0.35	0.35
9.65	0.67	0.54	5.00	0.00	0.35	0.35
9.70	0.67	0.54	5.00	0.00	0.35	0.35
9.75	0.67	0.54	5.00	0.00	0.35	0.35
9.80	0.67	0.54	5.00	0.00	0.35	0.35
9.85	0.67	0.54	5.00	0.00	0.35	0.35
9.90	0.67	0.54	5.00	0.00	0.35	0.35
9.95	0.67	0.54	5.00	0.00	0.35	0.35
10.00	0.67	0.54	5.00	0.00	0.35	0.35
10.05	0.67	0.54	5.00	0.00	0.35	0.35
10.10	0.67	0.54	5.00	0.00	0.35	0.35
10.15	0.67	0.54	5.00	0.00	0.35	0.35
10.20	0.67	0.54	5.00	0.00	0.35	0.35
10.25	0.67	0.54	5.00	0.00	0.35	0.35
10.30	0.67	0.54	5.00	0.00	0.35	0.35
10.35	0.67	0.54	5.00	0.00	0.35	0.35
10.40	0.67	0.54	5.00	0.00	0.35	0.35
10.45	0.67	0.54	5.00	0.00	0.35	0.35
10.50	0.67	0.54	5.00	0.00	0.35	0.35
10.55	0.67	0.54	5.00	0.00	0.35	0.35
10.60	0.67	0.54	5.00	0.00	0.35	0.35
10.65	0.67	0.54	5.00	0.00	0.35	0.35
10.70	0.67	0.54	5.00	0.00	0.35	0.35
10.75	0.67	0.54	5.00	0.00	0.35	0.35
10.80	0.67	0.54	5.00	0.00	0.35	0.35
10.85	0.67	0.54	5.00	0.00	0.35	0.35
10.90	0.67	0.54	5.00	0.00	0.34	0.34
10.95	0.67	0.54	5.00	0.00	0.34	0.34
11.00	0.67	0.54	5.00	0.00	0.34	0.34
11.05	0.67	0.54	5.00	0.00	0.34	0.34
11.10	0.67	0.54	5.00	0.00	0.34	0.34
11.15	0.67	0.54	5.00	0.00	0.34	0.34
11.20	0.67	0.54	5.00	0.00	0.34	0.34
11.25	0.67	0.54	5.00	0.00	0.34	0.34
11.30	0.67	0.54	5.00	0.00	0.34	0.34
11.35	0.67	0.54	5.00	0.00	0.34	0.34
11.40	0.67	0.54	5.00	0.00	0.34	0.34
11.45	0.67	0.54	5.00	0.00	0.34	0.34
11.50	0.67	0.54	5.00	0.00	0.34	0.34
11.55	0.67	0.54	5.00	0.00	0.34	0.34
11.60	0.67	0.54	5.00	0.00	0.34	0.34
11.65	0.67	0.54	5.00	0.00	0.34	0.34
11.70	0.67	0.54	5.00	0.00	0.34	0.34
11.75	0.67	0.54	5.00	0.00	0.34	0.34
11.80	0.67	0.54	5.00	0.00	0.34	0.34
11.85	0.67	0.54	5.00	0.00	0.34	0.34
11.90	0.67	0.54	5.00	0.00	0.34	0.34
11.95	0.67	0.54	5.00	0.00	0.34	0.34
12.00	0.67	0.54	5.00	0.00	0.34	0.34
12.05	0.67	0.54	5.00	0.00	0.34	0.34
12.10	0.67	0.54	5.00	0.00	0.34	0.34
12.15	0.67	0.54	5.00	0.00	0.34	0.34
12.20	0.67	0.54	5.00	0.00	0.34	0.34
12.25	0.67	0.54	5.00	0.00	0.34	0.34
12.30	0.67	0.54	5.00	0.00	0.34	0.34
12.35	0.67	0.54	5.00	0.00	0.34	0.34
12.40	0.67	0.54	5.00	0.00	0.34	0.34
12.45	0.67	0.54	5.00	0.00	0.34	0.34
12.50	0.67	0.54	5.00	0.00	0.34	0.34
12.55	0.67	0.54	5.00	0.00	0.33	0.33
12.60	0.67	0.54	5.00	0.00	0.33	0.33
12.65	0.67	0.54	5.00	0.00	0.33	0.33
12.70	0.67	0.54	5.00	0.00	0.33	0.33
12.75	0.67	0.54	5.00	0.00	0.33	0.33
12.80	0.67	0.54	5.00	0.00	0.33	0.33
12.85	0.67	0.54	5.00	0.00	0.33	0.33
12.90	0.67	0.54	5.00	0.00	0.33	0.33
12.95	0.67	0.54	5.00	0.00	0.33	0.33
13.00	0.67	0.54	5.00	0.00	0.33	0.33
13.05	0.67	0.54	5.00	0.00	0.33	0.33
13.10	0.67	0.54	5.00	0.00	0.33	0.33
13.15	0.67	0.54	5.00	0.00	0.33	0.33
13.20	0.67	0.54	5.00	0.00	0.33	0.33
13.25	0.67	0.54	5.00	0.00	0.33	0.33
13.30	0.67	0.54	5.00	0.00	0.33	0.33
13.35	0.67	0.54	5.00	0.00	0.33	0.33
13.40	0.67	0.54	5.00	0.00	0.33	0.33

13.45	0.67	0.54	5.00	0.00	0.33	0.33
13.50	0.67	0.54	5.00	0.00	0.33	0.33
13.55	0.67	0.54	5.00	0.00	0.33	0.33
13.60	0.67	0.54	5.00	0.00	0.33	0.33
13.65	0.67	0.54	5.00	0.00	0.33	0.33
13.70	0.67	0.54	5.00	0.00	0.32	0.32
13.75	0.67	0.54	5.00	0.00	0.32	0.32
13.80	0.67	0.54	5.00	0.00	0.32	0.32
13.85	0.67	0.54	5.00	0.00	0.32	0.32
13.90	0.67	0.54	5.00	0.00	0.32	0.32
13.95	0.67	0.54	5.00	0.00	0.32	0.32
14.00	0.67	0.54	5.00	0.00	0.32	0.32
14.05	0.67	0.54	5.00	0.00	0.32	0.32
14.10	0.67	0.54	5.00	0.00	0.32	0.32
14.15	0.67	0.54	5.00	0.00	0.32	0.32
14.20	0.67	0.54	5.00	0.00	0.32	0.32
14.25	0.67	0.54	5.00	0.00	0.32	0.32
14.30	0.67	0.54	5.00	0.00	0.32	0.32
14.35	0.67	0.54	5.00	0.00	0.32	0.32
14.40	0.67	0.54	5.00	0.00	0.32	0.32
14.45	0.67	0.54	5.00	0.00	0.32	0.32
14.50	0.67	0.54	5.00	0.00	0.32	0.32
14.55	0.67	0.54	5.00	0.00	0.32	0.32
14.60	0.67	0.54	5.00	0.00	0.31	0.31
14.65	0.67	0.54	5.00	0.00	0.31	0.31
14.70	0.67	0.54	5.00	0.00	0.31	0.31
14.75	0.67	0.54	5.00	0.00	0.31	0.31
14.80	0.67	0.54	5.00	0.00	0.31	0.31
14.85	0.67	0.54	5.00	0.00	0.31	0.31
14.90	0.67	0.54	5.00	0.00	0.31	0.31
14.95	0.67	0.54	5.00	0.00	0.31	0.31
15.00	0.67	0.54	5.00	0.00	0.31	0.31
15.05	0.67	0.54	5.00	0.00	0.31	0.31
15.10	0.67	0.54	5.00	0.00	0.31	0.31
15.15	0.67	0.54	5.00	0.00	0.31	0.31
15.20	0.67	0.54	5.00	0.00	0.31	0.31
15.25	0.67	0.54	5.00	0.00	0.31	0.31
15.30	0.67	0.54	5.00	0.00	0.31	0.31
15.35	0.67	0.54	5.00	0.00	0.31	0.31
15.40	0.67	0.54	5.00	0.00	0.30	0.30
15.45	0.67	0.54	5.00	0.00	0.30	0.30
15.50	0.67	0.54	5.00	0.00	0.30	0.30
15.55	0.67	0.54	5.00	0.00	0.30	0.30
15.60	0.67	0.54	5.00	0.00	0.30	0.30
15.65	0.67	0.54	5.00	0.00	0.30	0.30
15.70	0.67	0.54	5.00	0.00	0.30	0.30
15.75	0.67	0.54	5.00	0.00	0.30	0.30
15.80	0.67	0.54	5.00	0.00	0.30	0.30
15.85	0.67	0.54	5.00	0.00	0.30	0.30
15.90	0.67	0.54	5.00	0.00	0.30	0.30
15.95	0.67	0.54	5.00	0.00	0.30	0.30
16.00	0.67	0.54	5.00	0.00	0.30	0.30
16.05	0.67	0.54	5.00	0.00	0.30	0.30
16.10	0.67	0.54	5.00	0.00	0.29	0.29
16.15	0.67	0.54	5.00	0.00	0.29	0.29
16.20	0.67	0.54	5.00	0.00	0.29	0.29
16.25	0.67	0.54	5.00	0.00	0.29	0.29
16.30	0.67	0.54	5.00	0.00	0.29	0.29
16.35	0.67	0.54	5.00	0.00	0.29	0.29
16.40	0.67	0.53	5.00	0.00	0.29	0.29
16.45	0.67	0.53	5.00	0.00	0.29	0.29
16.50	0.67	0.53	5.00	0.00	0.29	0.29
16.55	0.67	0.53	5.00	0.00	0.29	0.29
16.60	0.67	0.53	5.00	0.00	0.29	0.29
16.65	0.67	0.53	5.00	0.00	0.29	0.29
16.70	0.67	0.53	5.00	0.00	0.28	0.28
16.75	0.67	0.53	5.00	0.00	0.28	0.28
16.80	0.67	0.53	5.00	0.00	0.28	0.28
16.85	0.67	0.53	5.00	0.00	0.28	0.28
16.90	0.67	0.53	5.00	0.00	0.28	0.28
16.95	0.67	0.53	5.00	0.00	0.28	0.28
17.00	0.67	0.53	5.00	0.00	0.28	0.28
17.05	0.67	0.53	5.00	0.00	0.28	0.28
17.10	0.67	0.53	5.00	0.00	0.28	0.28
17.15	0.67	0.53	5.00	0.00	0.28	0.28
17.20	0.67	0.53	5.00	0.00	0.28	0.28
17.25	0.67	0.53	5.00	0.00	0.27	0.27
17.30	0.67	0.53	5.00	0.00	0.27	0.27
17.35	0.67	0.53	5.00	0.00	0.27	0.27

17.40	0.67	0.53	5.00	0.00	0.27	0.27
17.45	0.67	0.53	5.00	0.00	0.27	0.27
17.50	0.67	0.53	5.00	0.00	0.27	0.27
17.55	0.67	0.53	5.00	0.00	0.27	0.27
17.60	0.67	0.53	5.00	0.00	0.27	0.27
17.65	0.67	0.53	5.00	0.00	0.27	0.27
17.70	0.67	0.53	5.00	0.00	0.27	0.27
17.75	0.67	0.53	5.00	0.00	0.26	0.26
17.80	0.67	0.53	5.00	0.00	0.26	0.26
17.85	0.67	0.53	5.00	0.00	0.26	0.26
17.90	0.67	0.53	5.00	0.00	0.26	0.26
17.95	0.67	0.53	5.00	0.00	0.26	0.26
18.00	0.67	0.53	5.00	0.00	0.26	0.26
18.05	0.67	0.53	5.00	0.00	0.26	0.26
18.10	0.67	0.53	5.00	0.00	0.26	0.26
18.15	0.67	0.53	5.00	0.00	0.26	0.26
18.20	0.67	0.53	5.00	0.00	0.25	0.25
18.25	0.67	0.53	5.00	0.00	0.25	0.25
18.30	0.67	0.53	5.00	0.00	0.25	0.25
18.35	0.67	0.53	5.00	0.00	0.25	0.25
18.40	0.67	0.53	5.00	0.00	0.25	0.25
18.45	0.67	0.53	5.00	0.00	0.25	0.25
18.50	0.67	0.53	5.00	0.00	0.25	0.25
18.55	0.67	0.53	5.00	0.00	0.25	0.25
18.60	0.67	0.53	5.00	0.00	0.24	0.24
18.65	0.67	0.53	5.00	0.00	0.24	0.24
18.70	0.67	0.53	5.00	0.00	0.24	0.24
18.75	0.67	0.53	5.00	0.00	0.24	0.24
18.80	0.67	0.53	5.00	0.00	0.24	0.24
18.85	0.67	0.53	5.00	0.00	0.24	0.24
18.90	0.67	0.53	5.00	0.00	0.24	0.24
18.95	0.67	0.53	5.00	0.00	0.23	0.23
19.00	0.67	0.53	5.00	0.00	0.23	0.23
19.05	0.67	0.53	5.00	0.00	0.23	0.23
19.10	0.67	0.53	5.00	0.00	0.23	0.23
19.15	0.67	0.53	5.00	0.00	0.23	0.23
19.20	0.67	0.53	5.00	0.00	0.23	0.23
19.25	0.67	0.53	5.00	0.00	0.23	0.23
19.30	0.67	0.53	5.00	0.00	0.22	0.22
19.35	0.67	0.53	5.00	0.00	0.22	0.22
19.40	0.67	0.53	5.00	0.00	0.22	0.22
19.45	0.67	0.53	5.00	0.00	0.22	0.22
19.50	0.67	0.53	5.00	0.00	0.22	0.22
19.55	0.67	0.53	5.00	0.00	0.22	0.22
19.60	0.67	0.53	5.00	0.00	0.22	0.22
19.65	0.67	0.53	5.00	0.00	0.22	0.22
19.70	0.67	0.53	5.00	0.00	0.22	0.22
19.75	0.67	0.53	5.00	0.00	0.22	0.22
19.80	0.67	0.53	5.00	0.00	0.22	0.22
19.85	0.67	0.53	5.00	0.00	0.21	0.21
19.90	0.67	0.53	5.00	0.00	0.21	0.21
19.95	0.67	0.53	5.00	0.00	0.21	0.21
20.00	0.67	0.53	5.00	0.00	0.21	0.21
20.05	0.67	0.53	5.00	0.00	0.21	0.21
20.10	0.67	0.53	5.00	0.00	0.21	0.21
20.15	0.67	0.53	5.00	0.00	0.21	0.21
20.20	0.67	0.53	5.00	0.00	0.21	0.21
20.25	0.67	0.53	5.00	0.00	0.21	0.21
20.30	0.67	0.53	5.00	0.00	0.21	0.21
20.35	0.67	0.53	5.00	0.00	0.21	0.21
20.40	0.67	0.53	5.00	0.00	0.21	0.21
20.45	0.67	0.53	5.00	0.00	0.21	0.21
20.50	0.67	0.53	5.00	0.00	0.21	0.21
20.55	0.67	0.53	5.00	0.00	0.21	0.21
20.60	0.67	0.53	5.00	0.00	0.21	0.21
20.65	0.67	0.53	5.00	0.00	0.21	0.21
20.70	0.67	0.53	5.00	0.00	0.21	0.21
20.75	0.67	0.53	5.00	0.00	0.21	0.21
20.80	0.67	0.53	5.00	0.00	0.20	0.20
20.85	0.67	0.53	5.00	0.00	0.20	0.20
20.90	0.67	0.53	5.00	0.00	0.20	0.20
20.95	0.67	0.53	5.00	0.00	0.20	0.20
21.00	0.67	0.53	5.00	0.00	0.20	0.20
21.05	0.67	0.53	5.00	0.00	0.20	0.20
21.10	0.67	0.53	5.00	0.00	0.20	0.20
21.15	0.67	0.53	5.00	0.00	0.20	0.20
21.20	0.67	0.53	5.00	0.00	0.20	0.20
21.25	0.67	0.53	5.00	0.00	0.20	0.20
21.30	0.67	0.53	5.00	0.00	0.20	0.20

21.35	0.67	0.53	5.00	0.00	0.20	0.20
21.40	0.67	0.53	5.00	0.00	0.20	0.20
21.45	0.67	0.53	5.00	0.00	0.20	0.20
21.50	0.67	0.53	5.00	0.00	0.20	0.20
21.55	0.67	0.53	5.00	0.00	0.20	0.20
21.60	0.67	0.53	5.00	0.00	0.20	0.20
21.65	0.67	0.53	5.00	0.00	0.20	0.20
21.70	0.67	0.53	5.00	0.00	0.20	0.20
21.75	0.67	0.53	5.00	0.00	0.19	0.19
21.80	0.67	0.53	5.00	0.00	0.19	0.19
21.85	0.67	0.53	5.00	0.00	0.19	0.19
21.90	0.67	0.53	5.00	0.00	0.19	0.19
21.95	0.67	0.53	5.00	0.00	0.19	0.19
22.00	0.67	0.53	5.00	0.00	0.19	0.19
22.05	0.67	0.53	5.00	0.00	0.19	0.19
22.10	0.67	0.53	5.00	0.00	0.19	0.19
22.15	0.67	0.53	5.00	0.00	0.19	0.19
22.20	0.67	0.53	5.00	0.00	0.19	0.19
22.25	0.67	0.53	5.00	0.00	0.19	0.19
22.30	0.67	0.53	5.00	0.00	0.19	0.19
22.35	0.67	0.53	5.00	0.00	0.19	0.19
22.40	0.67	0.53	5.00	0.00	0.19	0.19
22.45	0.67	0.53	5.00	0.00	0.19	0.19
22.50	0.67	0.53	5.00	0.00	0.19	0.19
22.55	0.67	0.53	5.00	0.00	0.19	0.19
22.60	0.67	0.53	5.00	0.00	0.19	0.19
22.65	0.67	0.53	5.00	0.00	0.19	0.19
22.70	0.67	0.53	5.00	0.00	0.18	0.18
22.75	0.67	0.53	5.00	0.00	0.18	0.18
22.80	0.67	0.53	5.00	0.00	0.18	0.18
22.85	0.67	0.53	5.00	0.00	0.18	0.18
22.90	0.67	0.53	5.00	0.00	0.18	0.18
22.95	0.67	0.53	5.00	0.00	0.18	0.18
23.00	0.67	0.53	5.00	0.00	0.18	0.18
23.05	0.67	0.53	5.00	0.00	0.18	0.18
23.10	0.67	0.53	5.00	0.00	0.18	0.18
23.15	0.67	0.53	5.00	0.00	0.18	0.18
23.20	0.67	0.53	5.00	0.00	0.18	0.18
23.25	0.67	0.53	5.00	0.00	0.18	0.18
23.30	0.67	0.53	5.00	0.00	0.18	0.18
23.35	0.67	0.53	5.00	0.00	0.18	0.18
23.40	0.67	0.53	5.00	0.00	0.18	0.18
23.45	0.67	0.53	5.00	0.00	0.18	0.18
23.50	0.67	0.53	5.00	0.00	0.18	0.18
23.55	0.67	0.53	5.00	0.00	0.18	0.18
23.60	0.67	0.53	5.00	0.00	0.17	0.17
23.65	0.67	0.53	5.00	0.00	0.17	0.17
23.70	0.67	0.53	5.00	0.00	0.17	0.17
23.75	0.67	0.53	5.00	0.00	0.17	0.17
23.80	0.67	0.53	5.00	0.00	0.17	0.17
23.85	0.67	0.53	5.00	0.00	0.17	0.17
23.90	0.67	0.53	5.00	0.00	0.17	0.17
23.95	0.67	0.53	5.00	0.00	0.17	0.17
24.00	0.67	0.53	5.00	0.00	0.17	0.17
24.05	0.67	0.53	5.00	0.00	0.17	0.17
24.10	0.67	0.53	5.00	0.00	0.17	0.17
24.15	0.67	0.52	5.00	0.00	0.17	0.17
24.20	0.67	0.52	5.00	0.00	0.17	0.17
24.25	0.67	0.52	5.00	0.00	0.17	0.17
24.30	0.67	0.52	5.00	0.00	0.17	0.17
24.35	0.67	0.52	5.00	0.00	0.17	0.17
24.40	0.67	0.52	5.00	0.00	0.17	0.17
24.45	0.67	0.52	5.00	0.00	0.16	0.16
24.50	0.67	0.52	5.00	0.00	0.16	0.16
24.55	0.67	0.52	5.00	0.00	0.16	0.16
24.60	0.67	0.52	5.00	0.00	0.16	0.16
24.65	0.67	0.52	5.00	0.00	0.16	0.16
24.70	0.67	0.52	5.00	0.00	0.16	0.16
24.75	0.67	0.52	5.00	0.00	0.16	0.16
24.80	0.67	0.52	5.00	0.00	0.16	0.16
24.85	0.67	0.52	5.00	0.00	0.16	0.16
24.90	0.67	0.52	5.00	0.00	0.16	0.16
24.95	0.67	0.52	5.00	0.00	0.16	0.16
25.00	0.67	0.52	5.00	0.00	0.16	0.16
25.05	0.67	0.52	5.00	0.00	0.16	0.16
25.10	0.67	0.52	5.00	0.00	0.16	0.16
25.15	0.67	0.52	5.00	0.00	0.16	0.16
25.20	0.67	0.52	5.00	0.00	0.16	0.16
25.25	0.67	0.52	5.00	0.00	0.16	0.16

25.30	0.67	0.52	5.00	0.00	0.15	0.15
25.35	0.67	0.52	5.00	0.00	0.15	0.15
25.40	0.67	0.52	5.00	0.00	0.15	0.15
25.45	0.67	0.52	5.00	0.00	0.15	0.15
25.50	0.67	0.52	5.00	0.00	0.15	0.15
25.55	0.67	0.52	5.00	0.00	0.15	0.15
25.60	0.67	0.52	5.00	0.00	0.15	0.15
25.65	0.67	0.52	5.00	0.00	0.15	0.15
25.70	0.67	0.52	5.00	0.00	0.15	0.15
25.75	0.67	0.52	5.00	0.00	0.15	0.15
25.80	0.67	0.52	5.00	0.00	0.15	0.15
25.85	0.67	0.52	5.00	0.00	0.15	0.15
25.90	0.67	0.52	5.00	0.00	0.15	0.15
25.95	0.67	0.52	5.00	0.00	0.15	0.15
26.00	0.67	0.52	5.00	0.00	0.15	0.15
26.05	0.67	0.52	5.00	0.00	0.15	0.15
26.10	0.67	0.52	5.00	0.00	0.15	0.15
26.15	0.67	0.52	5.00	0.00	0.15	0.15
26.20	0.67	0.52	5.00	0.00	0.15	0.15
26.25	0.67	0.52	5.00	0.00	0.15	0.15
26.30	0.67	0.52	5.00	0.00	0.15	0.15
26.35	0.67	0.52	5.00	0.00	0.14	0.14
26.40	0.67	0.52	5.00	0.00	0.14	0.14
26.45	0.67	0.52	5.00	0.00	0.14	0.14
26.50	0.67	0.52	5.00	0.00	0.14	0.14
26.55	0.67	0.52	5.00	0.00	0.14	0.14
26.60	0.67	0.52	5.00	0.00	0.14	0.14
26.65	0.67	0.52	5.00	0.00	0.14	0.14
26.70	0.67	0.52	5.00	0.00	0.14	0.14
26.75	0.67	0.52	5.00	0.00	0.14	0.14
26.80	0.67	0.52	5.00	0.00	0.14	0.14
26.85	0.67	0.52	5.00	0.00	0.14	0.14
26.90	0.67	0.52	5.00	0.00	0.14	0.14
26.95	0.67	0.52	5.00	0.00	0.14	0.14
27.00	0.67	0.52	5.00	0.00	0.14	0.14
27.05	0.67	0.52	5.00	0.00	0.14	0.14
27.10	0.67	0.52	5.00	0.00	0.14	0.14
27.15	0.67	0.52	5.00	0.00	0.14	0.14
27.20	0.67	0.52	5.00	0.00	0.14	0.14
27.25	0.67	0.52	5.00	0.00	0.14	0.14
27.30	0.67	0.52	5.00	0.00	0.14	0.14
27.35	0.67	0.52	5.00	0.00	0.14	0.14
27.40	0.67	0.52	5.00	0.00	0.14	0.14
27.45	0.67	0.52	5.00	0.00	0.14	0.14
27.50	0.67	0.52	5.00	0.00	0.13	0.13
27.55	0.67	0.52	5.00	0.00	0.13	0.13
27.60	0.67	0.52	5.00	0.00	0.13	0.13
27.65	0.67	0.52	5.00	0.00	0.13	0.13
27.70	0.66	0.52	5.00	0.00	0.13	0.13
27.75	0.66	0.52	5.00	0.00	0.13	0.13
27.80	0.66	0.52	5.00	0.00	0.13	0.13
27.85	0.66	0.52	5.00	0.00	0.13	0.13
27.90	0.66	0.52	5.00	0.00	0.13	0.13
27.95	0.66	0.52	5.00	0.00	0.13	0.13
28.00	0.66	0.52	5.00	0.00	0.13	0.13
28.05	0.66	0.52	5.00	0.00	0.13	0.13
28.10	0.66	0.52	5.00	0.00	0.13	0.13
28.15	0.66	0.52	5.00	0.00	0.13	0.13
28.20	0.66	0.52	5.00	0.00	0.13	0.13
28.25	0.66	0.52	5.00	0.00	0.13	0.13
28.30	0.66	0.52	5.00	0.00	0.13	0.13
28.35	0.66	0.52	5.00	0.00	0.13	0.13
28.40	0.66	0.52	5.00	0.00	0.13	0.13
28.45	0.66	0.52	5.00	0.00	0.13	0.13
28.50	0.66	0.52	5.00	0.00	0.13	0.13
28.55	0.66	0.52	5.00	0.00	0.13	0.13
28.60	0.66	0.52	5.00	0.00	0.13	0.13
28.65	0.66	0.52	5.00	0.00	0.13	0.13
28.70	0.66	0.52	5.00	0.00	0.13	0.13
28.75	0.66	0.52	5.00	0.00	0.12	0.12
28.80	0.66	0.52	5.00	0.00	0.12	0.12
28.85	0.66	0.52	5.00	0.00	0.12	0.12
28.90	0.66	0.52	5.00	0.00	0.12	0.12
28.95	0.66	0.52	5.00	0.00	0.12	0.12
29.00	0.66	0.52	5.00	0.00	0.12	0.12
29.05	0.66	0.52	5.00	0.00	0.12	0.12
29.10	0.66	0.52	5.00	0.00	0.12	0.12
29.15	0.66	0.52	5.00	0.00	0.12	0.12
29.20	0.66	0.52	5.00	0.00	0.12	0.12

29.25	0.66	0.52	5.00	0.00	0.12	0.12
29.30	0.66	0.52	5.00	0.00	0.12	0.12
29.35	0.66	0.52	5.00	0.00	0.12	0.12
29.40	0.66	0.52	5.00	0.00	0.12	0.12
29.45	0.66	0.52	5.00	0.00	0.12	0.12
29.50	0.66	0.52	5.00	0.00	0.12	0.12
29.55	0.66	0.52	5.00	0.00	0.12	0.12
29.60	0.66	0.52	5.00	0.00	0.12	0.12
29.65	0.66	0.52	5.00	0.00	0.12	0.12
29.70	0.66	0.52	5.00	0.00	0.12	0.12
29.75	0.66	0.52	5.00	0.00	0.12	0.12
29.80	0.66	0.52	5.00	0.00	0.12	0.12
29.85	0.66	0.52	5.00	0.00	0.12	0.12
29.90	0.66	0.52	5.00	0.00	0.12	0.12
29.95	0.66	0.52	5.00	0.00	0.12	0.12
30.00	0.66	0.52	5.00	0.00	0.12	0.12
30.05	2.00	0.52	5.00	0.00	0.12	0.12
30.10	2.00	0.52	5.00	0.00	0.12	0.12
30.15	2.00	0.52	5.00	0.00	0.12	0.12
30.20	2.00	0.52	5.00	0.00	0.12	0.12
30.25	2.00	0.52	5.00	0.00	0.12	0.12
30.30	2.00	0.52	5.00	0.00	0.12	0.12
30.35	2.00	0.52	5.00	0.00	0.12	0.12
30.40	2.00	0.52	5.00	0.00	0.12	0.12
30.45	2.00	0.52	5.00	0.00	0.12	0.12
30.50	2.00	0.51	5.00	0.00	0.12	0.12
30.55	2.00	0.51	5.00	0.00	0.12	0.12
30.60	2.00	0.51	5.00	0.00	0.12	0.12
30.65	2.00	0.51	5.00	0.00	0.12	0.12
30.70	2.00	0.51	5.00	0.00	0.12	0.12
30.75	2.00	0.51	5.00	0.00	0.12	0.12
30.80	2.00	0.51	5.00	0.00	0.12	0.12
30.85	2.00	0.51	5.00	0.00	0.12	0.12
30.90	2.00	0.51	5.00	0.00	0.12	0.12
30.95	2.00	0.51	5.00	0.00	0.12	0.12
31.00	2.00	0.51	5.00	0.00	0.12	0.12
31.05	2.00	0.51	5.00	0.00	0.12	0.12
31.10	2.00	0.51	5.00	0.00	0.12	0.12
31.15	2.00	0.51	5.00	0.00	0.12	0.12
31.20	2.00	0.51	5.00	0.00	0.12	0.12
31.25	2.00	0.51	5.00	0.00	0.12	0.12
31.30	2.00	0.51	5.00	0.00	0.12	0.12
31.35	2.00	0.51	5.00	0.00	0.12	0.12
31.40	2.00	0.51	5.00	0.00	0.12	0.12
31.45	2.00	0.51	5.00	0.00	0.12	0.12
31.50	2.00	0.51	5.00	0.00	0.12	0.12
31.55	2.00	0.51	5.00	0.00	0.12	0.12
31.60	2.00	0.51	5.00	0.00	0.12	0.12
31.65	2.00	0.51	5.00	0.00	0.12	0.12
31.70	2.00	0.51	5.00	0.00	0.12	0.12
31.75	2.00	0.51	5.00	0.00	0.12	0.12
31.80	2.00	0.51	5.00	0.00	0.12	0.12
31.85	2.00	0.51	5.00	0.00	0.12	0.12
31.90	2.00	0.51	5.00	0.00	0.12	0.12
31.95	2.00	0.51	5.00	0.00	0.12	0.12
32.00	2.00	0.51	5.00	0.00	0.12	0.12
32.05	2.00	0.51	5.00	0.00	0.12	0.12
32.10	2.00	0.51	5.00	0.00	0.12	0.12
32.15	2.00	0.51	5.00	0.00	0.12	0.12
32.20	2.00	0.51	5.00	0.00	0.12	0.12
32.25	2.00	0.51	5.00	0.00	0.12	0.12
32.30	2.00	0.51	5.00	0.00	0.12	0.12
32.35	2.00	0.51	5.00	0.00	0.12	0.12
32.40	2.00	0.51	5.00	0.00	0.12	0.12
32.45	2.00	0.51	5.00	0.00	0.12	0.12
32.50	2.00	0.51	5.00	0.00	0.12	0.12
32.55	2.00	0.51	5.00	0.00	0.12	0.12
32.60	2.00	0.51	5.00	0.00	0.12	0.12
32.65	2.00	0.51	5.00	0.00	0.12	0.12
32.70	2.00	0.51	5.00	0.00	0.12	0.12
32.75	2.00	0.50	5.00	0.00	0.12	0.12
32.80	2.00	0.50	5.00	0.00	0.12	0.12
32.85	2.00	0.50	5.00	0.00	0.12	0.12
32.90	2.00	0.50	5.00	0.00	0.12	0.12
32.95	2.00	0.50	5.00	0.00	0.12	0.12
33.00	2.00	0.50	5.00	0.00	0.12	0.12
33.05	2.00	0.50	5.00	0.00	0.12	0.12
33.10	2.00	0.50	5.00	0.00	0.12	0.12
33.15	2.00	0.50	5.00	0.00	0.12	0.12

33.20	2.00	0.50	5.00	0.00	0.12	0.12
33.25	2.00	0.50	5.00	0.00	0.12	0.12
33.30	2.00	0.50	5.00	0.00	0.12	0.12
33.35	2.00	0.50	5.00	0.00	0.12	0.12
33.40	2.00	0.50	5.00	0.00	0.12	0.12
33.45	2.00	0.50	5.00	0.00	0.12	0.12
33.50	2.00	0.50	5.00	0.00	0.12	0.12
33.55	2.00	0.50	5.00	0.00	0.12	0.12
33.60	2.00	0.50	5.00	0.00	0.12	0.12
33.65	2.00	0.50	5.00	0.00	0.12	0.12
33.70	2.00	0.50	5.00	0.00	0.12	0.12
33.75	2.00	0.50	5.00	0.00	0.12	0.12
33.80	2.00	0.50	5.00	0.00	0.12	0.12
33.85	2.00	0.50	5.00	0.00	0.12	0.12
33.90	2.00	0.50	5.00	0.00	0.12	0.12
33.95	2.00	0.50	5.00	0.00	0.12	0.12
34.00	2.00	0.50	5.00	0.00	0.12	0.12
34.05	0.64	0.50	5.00	0.00	0.12	0.12
34.10	0.64	0.50	5.00	0.00	0.12	0.12
34.15	0.64	0.50	5.00	0.00	0.11	0.11
34.20	0.64	0.50	5.00	0.00	0.11	0.11
34.25	0.64	0.50	5.00	0.00	0.11	0.11
34.30	0.64	0.50	5.00	0.00	0.11	0.11
34.35	0.64	0.50	5.00	0.00	0.11	0.11
34.40	0.64	0.50	5.00	0.00	0.11	0.11
34.45	0.64	0.50	5.00	0.00	0.11	0.11
34.50	0.64	0.50	5.00	0.00	0.11	0.11
34.55	0.64	0.50	5.00	0.00	0.11	0.11
34.60	0.64	0.50	5.00	0.00	0.11	0.11
34.65	0.64	0.50	5.00	0.00	0.11	0.11
34.70	0.64	0.50	5.00	0.00	0.11	0.11
34.75	0.64	0.50	5.00	0.00	0.11	0.11
34.80	0.64	0.50	5.00	0.00	0.11	0.11
34.85	0.64	0.50	5.00	0.00	0.11	0.11
34.90	0.64	0.50	5.00	0.00	0.11	0.11
34.95	0.64	0.49	5.00	0.00	0.11	0.11
35.00	0.64	0.49	5.00	0.00	0.11	0.11
35.05	0.64	0.49	5.00	0.00	0.11	0.11
35.10	0.64	0.49	5.00	0.00	0.11	0.11
35.15	0.64	0.49	5.00	0.00	0.11	0.11
35.20	0.64	0.49	5.00	0.00	0.11	0.11
35.25	0.64	0.49	5.00	0.00	0.11	0.11
35.30	0.64	0.49	5.00	0.00	0.11	0.11
35.35	0.64	0.49	5.00	0.00	0.10	0.10
35.40	0.64	0.49	5.00	0.00	0.10	0.10
35.45	0.64	0.49	5.00	0.00	0.10	0.10
35.50	0.64	0.49	5.00	0.00	0.10	0.10
35.55	0.64	0.49	5.00	0.00	0.10	0.10
35.60	0.64	0.49	5.00	0.00	0.10	0.10
35.65	0.64	0.49	5.00	0.00	0.10	0.10
35.70	0.64	0.49	5.00	0.00	0.10	0.10
35.75	0.64	0.49	5.00	0.00	0.10	0.10
35.80	0.64	0.49	5.00	0.00	0.10	0.10
35.85	0.64	0.49	5.00	0.00	0.10	0.10
35.90	0.64	0.49	5.00	0.00	0.10	0.10
35.95	0.64	0.49	5.00	0.00	0.10	0.10
36.00	0.64	0.49	5.00	0.00	0.10	0.10
36.05	0.64	0.49	5.00	0.00	0.10	0.10
36.10	0.63	0.49	5.00	0.00	0.10	0.10
36.15	0.63	0.49	5.00	0.00	0.10	0.10
36.20	0.63	0.49	5.00	0.00	0.10	0.10
36.25	0.63	0.49	5.00	0.00	0.10	0.10
36.30	0.63	0.49	5.00	0.00	0.10	0.10
36.35	0.63	0.49	5.00	0.00	0.10	0.10
36.40	0.63	0.49	5.00	0.00	0.10	0.10
36.45	0.63	0.49	5.00	0.00	0.10	0.10
36.50	0.63	0.49	5.00	0.00	0.10	0.10
36.55	0.63	0.49	5.00	0.00	0.09	0.09
36.60	0.63	0.49	5.00	0.00	0.09	0.09
36.65	0.63	0.49	5.00	0.00	0.09	0.09
36.70	0.63	0.49	5.00	0.00	0.09	0.09
36.75	0.63	0.49	5.00	0.00	0.09	0.09
36.80	0.63	0.49	5.00	0.00	0.09	0.09
36.85	0.63	0.49	5.00	0.00	0.09	0.09
36.90	0.63	0.49	5.00	0.00	0.09	0.09
36.95	0.63	0.49	5.00	0.00	0.09	0.09
37.00	0.63	0.49	5.00	0.00	0.09	0.09
37.05	0.63	0.49	5.00	0.00	0.09	0.09
37.10	0.63	0.49	5.00	0.00	0.09	0.09

37.15	0.63	0.48	5.00	0.00	0.09	0.09
37.20	0.63	0.48	5.00	0.00	0.09	0.09
37.25	0.63	0.48	5.00	0.00	0.09	0.09
37.30	0.63	0.48	5.00	0.00	0.09	0.09
37.35	0.63	0.48	5.00	0.00	0.09	0.09
37.40	0.63	0.48	5.00	0.00	0.09	0.09
37.45	0.63	0.48	5.00	0.00	0.09	0.09
37.50	0.63	0.48	5.00	0.00	0.09	0.09
37.55	0.63	0.48	5.00	0.00	0.09	0.09
37.60	0.63	0.48	5.00	0.00	0.09	0.09
37.65	0.63	0.48	5.00	0.00	0.09	0.09
37.70	0.63	0.48	5.00	0.00	0.09	0.09
37.75	0.63	0.48	5.00	0.00	0.08	0.08
37.80	0.63	0.48	5.00	0.00	0.08	0.08
37.85	0.63	0.48	5.00	0.00	0.08	0.08
37.90	0.63	0.48	5.00	0.00	0.08	0.08
37.95	0.63	0.48	5.00	0.00	0.08	0.08
38.00	0.63	0.48	5.00	0.00	0.08	0.08
38.05	0.63	0.48	5.00	0.00	0.08	0.08
38.10	0.63	0.48	5.00	0.00	0.08	0.08
38.15	0.63	0.48	5.00	0.00	0.08	0.08
38.20	0.63	0.48	5.00	0.00	0.08	0.08
38.25	0.63	0.48	5.00	0.00	0.08	0.08
38.30	0.63	0.48	5.00	0.00	0.08	0.08
38.35	0.63	0.48	5.00	0.00	0.08	0.08
38.40	0.63	0.48	5.00	0.00	0.08	0.08
38.45	0.63	0.48	5.00	0.00	0.08	0.08
38.50	0.63	0.48	5.00	0.00	0.08	0.08
38.55	0.63	0.48	5.00	0.00	0.08	0.08
38.60	0.63	0.48	5.00	0.00	0.08	0.08
38.65	0.63	0.48	5.00	0.00	0.08	0.08
38.70	0.63	0.48	5.00	0.00	0.08	0.08
38.75	0.63	0.48	5.00	0.00	0.08	0.08
38.80	0.63	0.48	5.00	0.00	0.08	0.08
38.85	0.63	0.48	5.00	0.00	0.07	0.07
38.90	0.62	0.48	5.00	0.00	0.07	0.07
38.95	0.62	0.48	5.00	0.00	0.07	0.07
39.00	0.62	0.48	5.00	0.00	0.07	0.07
39.05	0.62	0.48	5.00	0.00	0.07	0.07
39.10	0.62	0.48	5.00	0.00	0.07	0.07
39.15	0.62	0.48	5.00	0.00	0.07	0.07
39.20	0.62	0.48	5.00	0.00	0.07	0.07
39.25	0.62	0.48	5.00	0.00	0.07	0.07
39.30	0.62	0.48	5.00	0.00	0.07	0.07
39.35	0.62	0.47	5.00	0.00	0.07	0.07
39.40	0.62	0.47	5.00	0.00	0.07	0.07
39.45	0.62	0.47	5.00	0.00	0.07	0.07
39.50	0.62	0.47	5.00	0.00	0.07	0.07
39.55	0.62	0.47	5.00	0.00	0.07	0.07
39.60	0.62	0.47	5.00	0.00	0.07	0.07
39.65	0.62	0.47	5.00	0.00	0.07	0.07
39.70	0.62	0.47	5.00	0.00	0.07	0.07
39.75	0.62	0.47	5.00	0.00	0.07	0.07
39.80	0.62	0.47	5.00	0.00	0.07	0.07
39.85	0.62	0.47	5.00	0.00	0.07	0.07
39.90	0.62	0.47	5.00	0.00	0.07	0.07
39.95	0.62	0.47	5.00	0.00	0.07	0.07
40.00	0.62	0.47	5.00	0.00	0.07	0.07
40.05	0.62	0.47	5.00	0.00	0.06	0.06
40.10	0.62	0.47	5.00	0.00	0.06	0.06
40.15	0.62	0.47	5.00	0.00	0.06	0.06
40.20	0.62	0.47	5.00	0.00	0.06	0.06
40.25	0.62	0.47	5.00	0.00	0.06	0.06
40.30	0.62	0.47	5.00	0.00	0.06	0.06
40.35	0.62	0.47	5.00	0.00	0.06	0.06
40.40	0.62	0.47	5.00	0.00	0.06	0.06
40.45	0.62	0.47	5.00	0.00	0.06	0.06
40.50	0.62	0.47	5.00	0.00	0.06	0.06
40.55	0.62	0.47	5.00	0.00	0.06	0.06
40.60	0.62	0.47	5.00	0.00	0.06	0.06
40.65	0.62	0.47	5.00	0.00	0.06	0.06
40.70	0.62	0.47	5.00	0.00	0.06	0.06
40.75	0.62	0.47	5.00	0.00	0.06	0.06
40.80	0.62	0.47	5.00	0.00	0.06	0.06
40.85	0.62	0.47	5.00	0.00	0.06	0.06
40.90	0.62	0.47	5.00	0.00	0.06	0.06
40.95	0.62	0.47	5.00	0.00	0.06	0.06
41.00	0.62	0.47	5.00	0.00	0.06	0.06
41.05	0.62	0.47	5.00	0.00	0.06	0.06

41.10	0.62	0.47	5.00	0.00	0.06	0.06
41.15	0.62	0.47	5.00	0.00	0.06	0.06
41.20	0.62	0.47	5.00	0.00	0.06	0.06
41.25	0.62	0.47	5.00	0.00	0.06	0.06
41.30	0.62	0.47	5.00	0.00	0.06	0.06
41.35	0.62	0.47	5.00	0.00	0.06	0.06
41.40	0.62	0.47	5.00	0.00	0.06	0.06
41.45	0.62	0.47	5.00	0.00	0.06	0.06
41.50	0.62	0.47	5.00	0.00	0.06	0.06
41.55	0.62	0.46	5.00	0.00	0.06	0.06
41.60	0.62	0.46	5.00	0.00	0.05	0.05
41.65	0.62	0.46	5.00	0.00	0.05	0.05
41.70	0.62	0.46	5.00	0.00	0.05	0.05
41.75	0.62	0.46	5.00	0.00	0.05	0.05
41.80	0.62	0.46	5.00	0.00	0.05	0.05
41.85	0.61	0.46	5.00	0.00	0.05	0.05
41.90	0.61	0.46	5.00	0.00	0.05	0.05
41.95	0.61	0.46	5.00	0.00	0.05	0.05
42.00	0.61	0.46	5.00	0.00	0.05	0.05
42.05	0.61	0.46	5.00	0.00	0.05	0.05
42.10	0.61	0.46	5.00	0.00	0.05	0.05
42.15	0.61	0.46	5.00	0.00	0.05	0.05
42.20	0.61	0.46	5.00	0.00	0.05	0.05
42.25	0.61	0.46	5.00	0.00	0.05	0.05
42.30	0.61	0.46	5.00	0.00	0.05	0.05
42.35	0.61	0.46	5.00	0.00	0.05	0.05
42.40	0.61	0.46	5.00	0.00	0.05	0.05
42.45	0.61	0.46	5.00	0.00	0.05	0.05
42.50	0.61	0.46	5.00	0.00	0.05	0.05
42.55	0.61	0.46	5.00	0.00	0.05	0.05
42.60	0.61	0.46	5.00	0.00	0.05	0.05
42.65	0.61	0.46	5.00	0.00	0.05	0.05
42.70	0.61	0.46	5.00	0.00	0.05	0.05
42.75	0.61	0.46	5.00	0.00	0.05	0.05
42.80	0.61	0.46	5.00	0.00	0.05	0.05
42.85	0.61	0.46	5.00	0.00	0.05	0.05
42.90	0.61	0.46	5.00	0.00	0.05	0.05
42.95	0.61	0.46	5.00	0.00	0.05	0.05
43.00	0.61	0.46	5.00	0.00	0.05	0.05
43.05	0.61	0.46	5.00	0.00	0.05	0.05
43.10	0.61	0.46	5.00	0.00	0.05	0.05
43.15	0.61	0.46	5.00	0.00	0.05	0.05
43.20	0.61	0.46	5.00	0.00	0.05	0.05
43.25	0.61	0.46	5.00	0.00	0.04	0.04
43.30	0.61	0.46	5.00	0.00	0.04	0.04
43.35	0.61	0.46	5.00	0.00	0.04	0.04
43.40	0.61	0.46	5.00	0.00	0.04	0.04
43.45	0.61	0.46	5.00	0.00	0.04	0.04
43.50	0.61	0.46	5.00	0.00	0.04	0.04
43.55	0.61	0.46	5.00	0.00	0.04	0.04
43.60	0.61	0.46	5.00	0.00	0.04	0.04
43.65	0.61	0.46	5.00	0.00	0.04	0.04
43.70	0.61	0.46	5.00	0.00	0.04	0.04
43.75	0.61	0.46	5.00	0.00	0.04	0.04
43.80	0.61	0.45	5.00	0.00	0.04	0.04
43.85	0.61	0.45	5.00	0.00	0.04	0.04
43.90	0.61	0.45	5.00	0.00	0.04	0.04
43.95	0.61	0.45	5.00	0.00	0.04	0.04
44.00	0.61	0.45	5.00	0.00	0.04	0.04
44.05	0.61	0.45	5.00	0.00	0.04	0.04
44.10	0.61	0.45	5.00	0.00	0.04	0.04
44.15	0.61	0.45	5.00	0.00	0.04	0.04
44.20	0.61	0.45	5.00	0.00	0.04	0.04
44.25	0.61	0.45	5.00	0.00	0.04	0.04
44.30	0.61	0.45	5.00	0.00	0.04	0.04
44.35	0.61	0.45	5.00	0.00	0.04	0.04
44.40	0.61	0.45	5.00	0.00	0.04	0.04
44.45	0.61	0.45	5.00	0.00	0.04	0.04
44.50	0.61	0.45	5.00	0.00	0.04	0.04
44.55	0.61	0.45	5.00	0.00	0.04	0.04
44.60	0.61	0.45	5.00	0.00	0.04	0.04
44.65	0.61	0.45	5.00	0.00	0.04	0.04
44.70	0.61	0.45	5.00	0.00	0.04	0.04
44.75	0.61	0.45	5.00	0.00	0.04	0.04
44.80	0.61	0.45	5.00	0.00	0.04	0.04
44.85	0.61	0.45	5.00	0.00	0.04	0.04
44.90	0.61	0.45	5.00	0.00	0.03	0.03
44.95	0.60	0.45	5.00	0.00	0.03	0.03
45.00	0.60	0.45	5.00	0.00	0.03	0.03

45.05	0.60	0.45	5.00	0.00	0.03	0.03
45.10	0.60	0.45	5.00	0.00	0.03	0.03
45.15	0.60	0.45	5.00	0.00	0.03	0.03
45.20	0.60	0.45	5.00	0.00	0.03	0.03
45.25	0.60	0.45	5.00	0.00	0.03	0.03
45.30	0.60	0.45	5.00	0.00	0.03	0.03
45.35	0.60	0.45	5.00	0.00	0.03	0.03
45.40	0.60	0.45	5.00	0.00	0.03	0.03
45.45	0.60	0.45	5.00	0.00	0.03	0.03
45.50	0.60	0.45	5.00	0.00	0.03	0.03
45.55	0.60	0.45	5.00	0.00	0.03	0.03
45.60	0.60	0.45	5.00	0.00	0.03	0.03
45.65	0.60	0.45	5.00	0.00	0.03	0.03
45.70	0.60	0.45	5.00	0.00	0.03	0.03
45.75	0.60	0.45	5.00	0.00	0.03	0.03
45.80	0.60	0.45	5.00	0.00	0.03	0.03
45.85	0.60	0.45	5.00	0.00	0.03	0.03
45.90	0.60	0.45	5.00	0.00	0.03	0.03
45.95	0.60	0.45	5.00	0.00	0.03	0.03
46.00	0.60	0.44	5.00	0.00	0.03	0.03
46.05	0.60	0.44	5.00	0.00	0.03	0.03
46.10	0.60	0.44	5.00	0.00	0.03	0.03
46.15	0.60	0.44	5.00	0.00	0.03	0.03
46.20	0.60	0.44	5.00	0.00	0.03	0.03
46.25	0.60	0.44	5.00	0.00	0.03	0.03
46.30	0.60	0.44	5.00	0.00	0.03	0.03
46.35	0.60	0.44	5.00	0.00	0.03	0.03
46.40	0.60	0.44	5.00	0.00	0.03	0.03
46.45	0.60	0.44	5.00	0.00	0.03	0.03
46.50	0.60	0.44	5.00	0.00	0.03	0.03
46.55	0.60	0.44	5.00	0.00	0.03	0.03
46.60	0.60	0.44	5.00	0.00	0.02	0.02
46.65	0.60	0.44	5.00	0.00	0.02	0.02
46.70	0.60	0.44	5.00	0.00	0.02	0.02
46.75	0.60	0.44	5.00	0.00	0.02	0.02
46.80	0.60	0.44	5.00	0.00	0.02	0.02
46.85	0.60	0.44	5.00	0.00	0.02	0.02
46.90	0.60	0.44	5.00	0.00	0.02	0.02
46.95	0.60	0.44	5.00	0.00	0.02	0.02
47.00	0.60	0.44	5.00	0.00	0.02	0.02
47.05	0.60	0.44	5.00	0.00	0.02	0.02
47.10	0.60	0.44	5.00	0.00	0.02	0.02
47.15	0.60	0.44	5.00	0.00	0.02	0.02
47.20	0.60	0.44	5.00	0.00	0.02	0.02
47.25	0.60	0.44	5.00	0.00	0.02	0.02
47.30	0.60	0.44	5.00	0.00	0.02	0.02
47.35	0.60	0.44	5.00	0.00	0.02	0.02
47.40	0.60	0.44	5.00	0.00	0.02	0.02
47.45	0.60	0.44	5.00	0.00	0.02	0.02
47.50	0.60	0.44	5.00	0.00	0.02	0.02
47.55	0.60	0.44	5.00	0.00	0.02	0.02
47.60	0.60	0.44	5.00	0.00	0.02	0.02
47.65	0.60	0.44	5.00	0.00	0.02	0.02
47.70	0.60	0.44	5.00	0.00	0.02	0.02
47.75	0.60	0.44	5.00	0.00	0.02	0.02
47.80	0.60	0.44	5.00	0.00	0.02	0.02
47.85	0.60	0.44	5.00	0.00	0.02	0.02
47.90	0.60	0.44	5.00	0.00	0.02	0.02
47.95	0.60	0.44	5.00	0.00	0.02	0.02
48.00	0.60	0.44	5.00	0.00	0.02	0.02
48.05	0.60	0.44	5.00	0.00	0.02	0.02
48.10	0.60	0.44	5.00	0.00	0.02	0.02
48.15	0.59	0.44	5.00	0.00	0.02	0.02
48.20	0.59	0.43	5.00	0.00	0.01	0.01
48.25	0.59	0.43	5.00	0.00	0.01	0.01
48.30	0.59	0.43	5.00	0.00	0.01	0.01
48.35	0.59	0.43	5.00	0.00	0.01	0.01
48.40	0.59	0.43	5.00	0.00	0.01	0.01
48.45	0.59	0.43	5.00	0.00	0.01	0.01
48.50	0.59	0.43	5.00	0.00	0.01	0.01
48.55	0.59	0.43	5.00	0.00	0.01	0.01
48.60	0.59	0.43	5.00	0.00	0.01	0.01
48.65	0.59	0.43	5.00	0.00	0.01	0.01
48.70	0.59	0.43	5.00	0.00	0.01	0.01
48.75	0.59	0.43	5.00	0.00	0.01	0.01
48.80	0.59	0.43	5.00	0.00	0.01	0.01
48.85	0.59	0.43	5.00	0.00	0.01	0.01
48.90	0.59	0.43	5.00	0.00	0.01	0.01
48.95	0.59	0.43	5.00	0.00	0.01	0.01

49.00	0.59	0.43	5.00	0.00	0.01	0.01
49.05	0.59	0.43	5.00	0.00	0.01	0.01
49.10	0.59	0.43	5.00	0.00	0.01	0.01
49.15	0.59	0.43	5.00	0.00	0.01	0.01
49.20	0.59	0.43	5.00	0.00	0.01	0.01
49.25	0.59	0.43	5.00	0.00	0.01	0.01
49.30	0.59	0.43	5.00	0.00	0.01	0.01
49.35	0.59	0.43	5.00	0.00	0.01	0.01
49.40	0.59	0.43	5.00	0.00	0.01	0.01
49.45	0.59	0.43	5.00	0.00	0.01	0.01
49.50	0.59	0.43	5.00	0.00	0.01	0.01
49.55	0.59	0.43	5.00	0.00	0.01	0.01
49.60	0.59	0.43	5.00	0.00	0.01	0.01
49.65	0.59	0.43	5.00	0.00	0.01	0.01
49.70	0.59	0.43	5.00	0.00	0.01	0.01
49.75	0.59	0.43	5.00	0.00	0.00	0.00
49.80	0.59	0.43	5.00	0.00	0.00	0.00
49.85	0.59	0.43	5.00	0.00	0.00	0.00
49.90	0.59	0.43	5.00	0.00	0.00	0.00
49.95	0.59	0.43	5.00	0.00	0.00	0.00
50.00	0.59	0.43	5.00	0.00	0.00	0.00
50.05	0.59	0.43	5.00	0.00	0.00	0.00
50.10	0.59	0.43	5.00	0.00	0.00	0.00
50.15	0.59	0.43	5.00	0.00	0.00	0.00
50.20	0.59	0.43	5.00	0.00	0.00	0.00
50.25	0.59	0.43	5.00	0.00	0.00	0.00
50.30	0.59	0.43	5.00	0.00	0.00	0.00
50.35	0.59	0.43	5.00	0.00	0.00	0.00
50.40	0.59	0.42	5.00	0.00	0.00	0.00
50.45	0.59	0.42	5.00	0.00	0.00	0.00
50.50	0.59	0.42	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2,   CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)

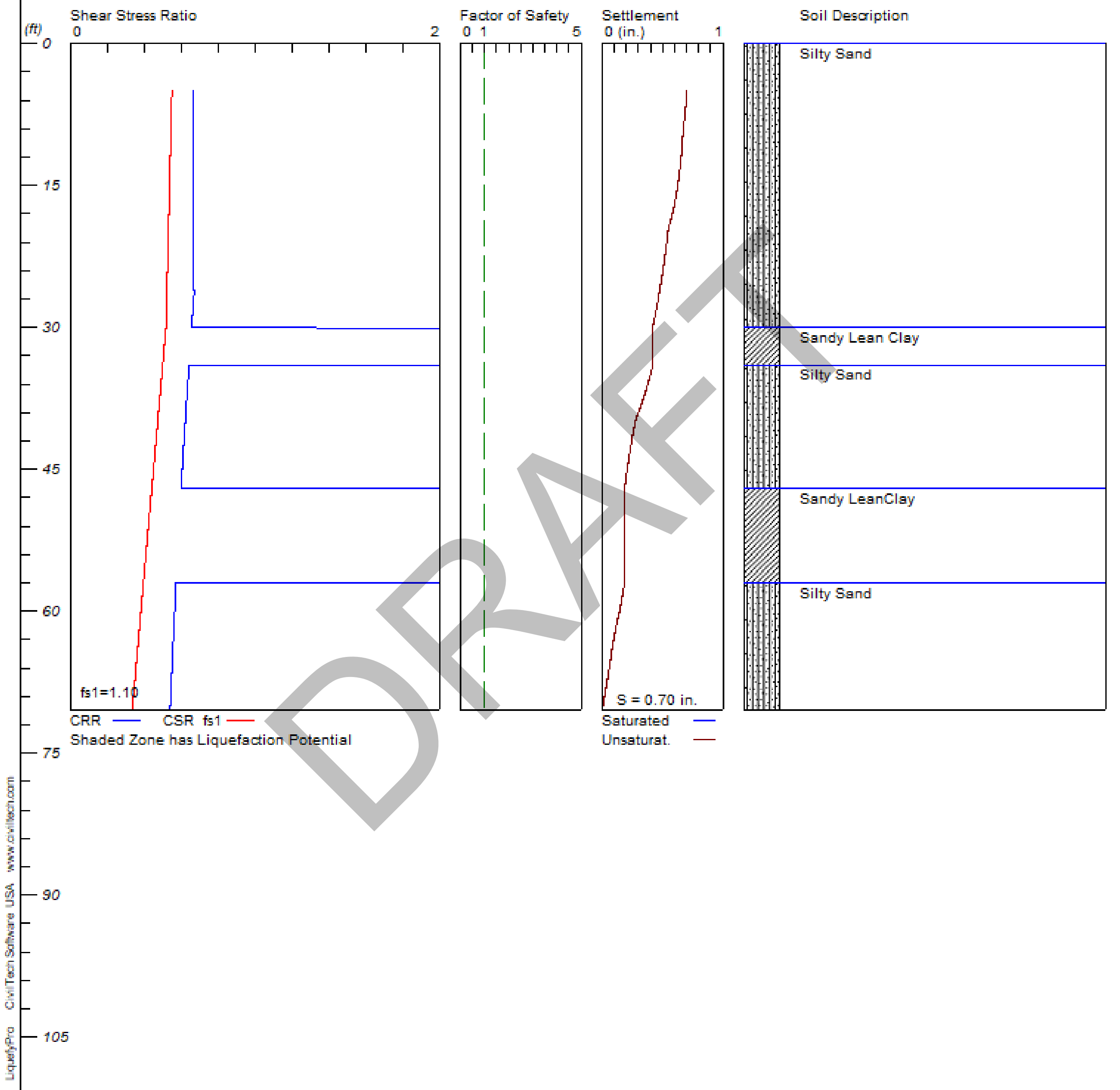
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated and Unsaturated Sands
NoLiq	No-Liquefy Soils

LIQUEFACTION ANALYSIS

Ontario Sports Park

Hole No.=BH06 Water Depth=130 ft

Magnitude=6.7
Acceleration=.778g



CivilTech Corporation

Plate A-1

****
LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: C:\Users\jmeneses\Desktop\HMD\00-23-2255--Ontario Sport Complex\Settlement\BH06.liq
Title: Ontario Sports Park
Subtitle:

Surface Elev.=
Hole No.=BH06
Depth of Hole= 70.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration= 0.78 g
Earthquake Magnitude= 6.70

Input Data:

Surface Elev.=
Hole No.=BH06
Depth of Hole=70.50 ft
Water Table during Earthquake= 130.00 ft
Water Table during In-Situ Testing= 130.00 ft
Max. Acceleration=0.78 g
Earthquake Magnitude=6.70
No-Liquefiable Soils: CL, OL are Non-Liq. Soil

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu, M-correction
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1.1
   Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
5.00	21.00	125.00	12.00
10.00	36.00	125.00	12.00
15.00	37.00	125.00	12.00
20.00	36.00	125.00	12.00
25.00	38.00	125.00	12.00
30.00	27.00	110.00	NoLiq
35.00	38.00	125.00	12.00
40.00	35.00	125.00	12.00
45.00	43.00	125.00	12.00
50.00	28.00	110.00	NoLiq
55.00	34.00	110.00	NoLiq
60.00	34.00	125.00	24.20
65.00	41.00	125.00	24.20
70.00	40.00	125.00	24.20

Output Results:

Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.70 in.
Total Settlement of Saturated and Unsaturated Sands=0.70 in.
Differential Settlement=0.350 to 0.462 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
5.00	0.67	0.55	5.00	0.00	0.70	0.70
5.05	0.67	0.55	5.00	0.00	0.70	0.70
5.10	0.67	0.55	5.00	0.00	0.70	0.70
5.15	0.67	0.55	5.00	0.00	0.70	0.70
5.20	0.67	0.55	5.00	0.00	0.70	0.70
5.25	0.67	0.55	5.00	0.00	0.70	0.70
5.30	0.67	0.55	5.00	0.00	0.70	0.70

5.35	0.67	0.55	5.00	0.00	0.70	0.70
5.40	0.67	0.55	5.00	0.00	0.70	0.70
5.45	0.67	0.55	5.00	0.00	0.70	0.70
5.50	0.67	0.55	5.00	0.00	0.70	0.70
5.55	0.67	0.55	5.00	0.00	0.70	0.70
5.60	0.67	0.55	5.00	0.00	0.70	0.70
5.65	0.67	0.55	5.00	0.00	0.70	0.70
5.70	0.67	0.55	5.00	0.00	0.70	0.70
5.75	0.67	0.55	5.00	0.00	0.70	0.70
5.80	0.67	0.55	5.00	0.00	0.70	0.70
5.85	0.67	0.55	5.00	0.00	0.70	0.70
5.90	0.67	0.55	5.00	0.00	0.70	0.70
5.95	0.67	0.55	5.00	0.00	0.70	0.70
6.00	0.67	0.55	5.00	0.00	0.70	0.70
6.05	0.67	0.55	5.00	0.00	0.70	0.70
6.10	0.67	0.55	5.00	0.00	0.70	0.70
6.15	0.67	0.55	5.00	0.00	0.70	0.70
6.20	0.67	0.55	5.00	0.00	0.70	0.70
6.25	0.67	0.55	5.00	0.00	0.69	0.69
6.30	0.67	0.55	5.00	0.00	0.69	0.69
6.35	0.67	0.55	5.00	0.00	0.69	0.69
6.40	0.67	0.55	5.00	0.00	0.69	0.69
6.45	0.67	0.55	5.00	0.00	0.69	0.69
6.50	0.67	0.55	5.00	0.00	0.69	0.69
6.55	0.67	0.55	5.00	0.00	0.69	0.69
6.60	0.67	0.55	5.00	0.00	0.69	0.69
6.65	0.67	0.55	5.00	0.00	0.69	0.69
6.70	0.67	0.55	5.00	0.00	0.69	0.69
6.75	0.67	0.55	5.00	0.00	0.69	0.69
6.80	0.67	0.55	5.00	0.00	0.69	0.69
6.85	0.67	0.55	5.00	0.00	0.69	0.69
6.90	0.67	0.55	5.00	0.00	0.69	0.69
6.95	0.67	0.55	5.00	0.00	0.69	0.69
7.00	0.67	0.55	5.00	0.00	0.69	0.69
7.05	0.67	0.55	5.00	0.00	0.69	0.69
7.10	0.67	0.55	5.00	0.00	0.69	0.69
7.15	0.67	0.55	5.00	0.00	0.69	0.69
7.20	0.67	0.55	5.00	0.00	0.69	0.69
7.25	0.67	0.55	5.00	0.00	0.69	0.69
7.30	0.67	0.55	5.00	0.00	0.69	0.69
7.35	0.67	0.55	5.00	0.00	0.69	0.69
7.40	0.67	0.55	5.00	0.00	0.69	0.69
7.45	0.67	0.55	5.00	0.00	0.69	0.69
7.50	0.67	0.55	5.00	0.00	0.69	0.69
7.55	0.67	0.55	5.00	0.00	0.69	0.69
7.60	0.67	0.55	5.00	0.00	0.69	0.69
7.65	0.67	0.55	5.00	0.00	0.69	0.69
7.70	0.67	0.55	5.00	0.00	0.69	0.69
7.75	0.67	0.55	5.00	0.00	0.68	0.68
7.80	0.67	0.55	5.00	0.00	0.68	0.68
7.85	0.67	0.55	5.00	0.00	0.68	0.68
7.90	0.67	0.55	5.00	0.00	0.68	0.68
7.95	0.67	0.55	5.00	0.00	0.68	0.68
8.00	0.67	0.55	5.00	0.00	0.68	0.68
8.05	0.67	0.55	5.00	0.00	0.68	0.68
8.10	0.67	0.55	5.00	0.00	0.68	0.68
8.15	0.67	0.55	5.00	0.00	0.68	0.68
8.20	0.67	0.55	5.00	0.00	0.68	0.68
8.25	0.67	0.55	5.00	0.00	0.68	0.68
8.30	0.67	0.55	5.00	0.00	0.68	0.68
8.35	0.67	0.55	5.00	0.00	0.68	0.68
8.40	0.67	0.55	5.00	0.00	0.68	0.68
8.45	0.67	0.55	5.00	0.00	0.68	0.68
8.50	0.67	0.55	5.00	0.00	0.68	0.68
8.55	0.67	0.55	5.00	0.00	0.68	0.68
8.60	0.67	0.55	5.00	0.00	0.68	0.68
8.65	0.67	0.55	5.00	0.00	0.68	0.68
8.70	0.67	0.54	5.00	0.00	0.68	0.68
8.75	0.67	0.54	5.00	0.00	0.68	0.68
8.80	0.67	0.54	5.00	0.00	0.67	0.67
8.85	0.67	0.54	5.00	0.00	0.67	0.67
8.90	0.67	0.54	5.00	0.00	0.67	0.67
8.95	0.67	0.54	5.00	0.00	0.67	0.67
9.00	0.67	0.54	5.00	0.00	0.67	0.67
9.05	0.67	0.54	5.00	0.00	0.67	0.67
9.10	0.67	0.54	5.00	0.00	0.67	0.67
9.15	0.67	0.54	5.00	0.00	0.67	0.67
9.20	0.67	0.54	5.00	0.00	0.67	0.67
9.25	0.67	0.54	5.00	0.00	0.67	0.67

9.30	0.67	0.54	5.00	0.00	0.67	0.67
9.35	0.67	0.54	5.00	0.00	0.67	0.67
9.40	0.67	0.54	5.00	0.00	0.67	0.67
9.45	0.67	0.54	5.00	0.00	0.67	0.67
9.50	0.67	0.54	5.00	0.00	0.67	0.67
9.55	0.67	0.54	5.00	0.00	0.67	0.67
9.60	0.67	0.54	5.00	0.00	0.67	0.67
9.65	0.67	0.54	5.00	0.00	0.67	0.67
9.70	0.67	0.54	5.00	0.00	0.67	0.67
9.75	0.67	0.54	5.00	0.00	0.67	0.67
9.80	0.67	0.54	5.00	0.00	0.67	0.67
9.85	0.67	0.54	5.00	0.00	0.67	0.67
9.90	0.67	0.54	5.00	0.00	0.67	0.67
9.95	0.67	0.54	5.00	0.00	0.67	0.67
10.00	0.67	0.54	5.00	0.00	0.67	0.67
10.05	0.67	0.54	5.00	0.00	0.67	0.67
10.10	0.67	0.54	5.00	0.00	0.67	0.67
10.15	0.67	0.54	5.00	0.00	0.67	0.67
10.20	0.67	0.54	5.00	0.00	0.67	0.67
10.25	0.67	0.54	5.00	0.00	0.67	0.67
10.30	0.67	0.54	5.00	0.00	0.67	0.67
10.35	0.67	0.54	5.00	0.00	0.67	0.67
10.40	0.67	0.54	5.00	0.00	0.66	0.66
10.45	0.67	0.54	5.00	0.00	0.66	0.66
10.50	0.67	0.54	5.00	0.00	0.66	0.66
10.55	0.67	0.54	5.00	0.00	0.66	0.66
10.60	0.67	0.54	5.00	0.00	0.66	0.66
10.65	0.67	0.54	5.00	0.00	0.66	0.66
10.70	0.67	0.54	5.00	0.00	0.66	0.66
10.75	0.67	0.54	5.00	0.00	0.66	0.66
10.80	0.67	0.54	5.00	0.00	0.66	0.66
10.85	0.67	0.54	5.00	0.00	0.66	0.66
10.90	0.67	0.54	5.00	0.00	0.66	0.66
10.95	0.67	0.54	5.00	0.00	0.66	0.66
11.00	0.67	0.54	5.00	0.00	0.66	0.66
11.05	0.67	0.54	5.00	0.00	0.66	0.66
11.10	0.67	0.54	5.00	0.00	0.66	0.66
11.15	0.67	0.54	5.00	0.00	0.66	0.66
11.20	0.67	0.54	5.00	0.00	0.66	0.66
11.25	0.67	0.54	5.00	0.00	0.66	0.66
11.30	0.67	0.54	5.00	0.00	0.66	0.66
11.35	0.67	0.54	5.00	0.00	0.66	0.66
11.40	0.67	0.54	5.00	0.00	0.66	0.66
11.45	0.67	0.54	5.00	0.00	0.66	0.66
11.50	0.67	0.54	5.00	0.00	0.66	0.66
11.55	0.67	0.54	5.00	0.00	0.66	0.66
11.60	0.67	0.54	5.00	0.00	0.66	0.66
11.65	0.67	0.54	5.00	0.00	0.66	0.66
11.70	0.67	0.54	5.00	0.00	0.66	0.66
11.75	0.67	0.54	5.00	0.00	0.66	0.66
11.80	0.67	0.54	5.00	0.00	0.66	0.66
11.85	0.67	0.54	5.00	0.00	0.66	0.66
11.90	0.67	0.54	5.00	0.00	0.66	0.66
11.95	0.67	0.54	5.00	0.00	0.65	0.65
12.00	0.67	0.54	5.00	0.00	0.65	0.65
12.05	0.67	0.54	5.00	0.00	0.65	0.65
12.10	0.67	0.54	5.00	0.00	0.65	0.65
12.15	0.67	0.54	5.00	0.00	0.65	0.65
12.20	0.67	0.54	5.00	0.00	0.65	0.65
12.25	0.67	0.54	5.00	0.00	0.65	0.65
12.30	0.67	0.54	5.00	0.00	0.65	0.65
12.35	0.67	0.54	5.00	0.00	0.65	0.65
12.40	0.67	0.54	5.00	0.00	0.65	0.65
12.45	0.67	0.54	5.00	0.00	0.65	0.65
12.50	0.67	0.54	5.00	0.00	0.65	0.65
12.55	0.67	0.54	5.00	0.00	0.65	0.65
12.60	0.67	0.54	5.00	0.00	0.65	0.65
12.65	0.67	0.54	5.00	0.00	0.65	0.65
12.70	0.67	0.54	5.00	0.00	0.65	0.65
12.75	0.67	0.54	5.00	0.00	0.65	0.65
12.80	0.67	0.54	5.00	0.00	0.65	0.65
12.85	0.67	0.54	5.00	0.00	0.65	0.65
12.90	0.67	0.54	5.00	0.00	0.65	0.65
12.95	0.67	0.54	5.00	0.00	0.65	0.65
13.00	0.67	0.54	5.00	0.00	0.65	0.65
13.05	0.67	0.54	5.00	0.00	0.65	0.65
13.10	0.67	0.54	5.00	0.00	0.65	0.65
13.15	0.67	0.54	5.00	0.00	0.65	0.65
13.20	0.67	0.54	5.00	0.00	0.64	0.64

13.25	0.67	0.54	5.00	0.00	0.64	0.64
13.30	0.67	0.54	5.00	0.00	0.64	0.64
13.35	0.67	0.54	5.00	0.00	0.64	0.64
13.40	0.67	0.54	5.00	0.00	0.64	0.64
13.45	0.67	0.54	5.00	0.00	0.64	0.64
13.50	0.67	0.54	5.00	0.00	0.64	0.64
13.55	0.67	0.54	5.00	0.00	0.64	0.64
13.60	0.67	0.54	5.00	0.00	0.64	0.64
13.65	0.67	0.54	5.00	0.00	0.64	0.64
13.70	0.67	0.54	5.00	0.00	0.64	0.64
13.75	0.67	0.54	5.00	0.00	0.64	0.64
13.80	0.67	0.54	5.00	0.00	0.64	0.64
13.85	0.67	0.54	5.00	0.00	0.64	0.64
13.90	0.67	0.54	5.00	0.00	0.64	0.64
13.95	0.67	0.54	5.00	0.00	0.64	0.64
14.00	0.67	0.54	5.00	0.00	0.64	0.64
14.05	0.67	0.54	5.00	0.00	0.64	0.64
14.10	0.67	0.54	5.00	0.00	0.64	0.64
14.15	0.67	0.54	5.00	0.00	0.64	0.64
14.20	0.67	0.54	5.00	0.00	0.63	0.63
14.25	0.67	0.54	5.00	0.00	0.63	0.63
14.30	0.67	0.54	5.00	0.00	0.63	0.63
14.35	0.67	0.54	5.00	0.00	0.63	0.63
14.40	0.67	0.54	5.00	0.00	0.63	0.63
14.45	0.67	0.54	5.00	0.00	0.63	0.63
14.50	0.67	0.54	5.00	0.00	0.63	0.63
14.55	0.67	0.54	5.00	0.00	0.63	0.63
14.60	0.67	0.54	5.00	0.00	0.63	0.63
14.65	0.67	0.54	5.00	0.00	0.63	0.63
14.70	0.67	0.54	5.00	0.00	0.63	0.63
14.75	0.67	0.54	5.00	0.00	0.63	0.63
14.80	0.67	0.54	5.00	0.00	0.63	0.63
14.85	0.67	0.54	5.00	0.00	0.63	0.63
14.90	0.67	0.54	5.00	0.00	0.63	0.63
14.95	0.67	0.54	5.00	0.00	0.63	0.63
15.00	0.67	0.54	5.00	0.00	0.63	0.63
15.05	0.67	0.54	5.00	0.00	0.62	0.62
15.10	0.67	0.54	5.00	0.00	0.62	0.62
15.15	0.67	0.54	5.00	0.00	0.62	0.62
15.20	0.67	0.54	5.00	0.00	0.62	0.62
15.25	0.67	0.54	5.00	0.00	0.62	0.62
15.30	0.67	0.54	5.00	0.00	0.62	0.62
15.35	0.67	0.54	5.00	0.00	0.62	0.62
15.40	0.67	0.54	5.00	0.00	0.62	0.62
15.45	0.67	0.54	5.00	0.00	0.62	0.62
15.50	0.67	0.54	5.00	0.00	0.62	0.62
15.55	0.67	0.54	5.00	0.00	0.62	0.62
15.60	0.67	0.54	5.00	0.00	0.62	0.62
15.65	0.67	0.54	5.00	0.00	0.62	0.62
15.70	0.67	0.54	5.00	0.00	0.62	0.62
15.75	0.67	0.54	5.00	0.00	0.62	0.62
15.80	0.67	0.54	5.00	0.00	0.62	0.62
15.85	0.67	0.54	5.00	0.00	0.62	0.62
15.90	0.67	0.54	5.00	0.00	0.61	0.61
15.95	0.67	0.54	5.00	0.00	0.61	0.61
16.00	0.67	0.54	5.00	0.00	0.61	0.61
16.05	0.67	0.54	5.00	0.00	0.61	0.61
16.10	0.67	0.54	5.00	0.00	0.61	0.61
16.15	0.67	0.54	5.00	0.00	0.61	0.61
16.20	0.67	0.54	5.00	0.00	0.61	0.61
16.25	0.67	0.54	5.00	0.00	0.61	0.61
16.30	0.67	0.54	5.00	0.00	0.61	0.61
16.35	0.67	0.54	5.00	0.00	0.61	0.61
16.40	0.67	0.53	5.00	0.00	0.61	0.61
16.45	0.67	0.53	5.00	0.00	0.61	0.61
16.50	0.67	0.53	5.00	0.00	0.61	0.61
16.55	0.67	0.53	5.00	0.00	0.61	0.61
16.60	0.67	0.53	5.00	0.00	0.60	0.60
16.65	0.67	0.53	5.00	0.00	0.60	0.60
16.70	0.67	0.53	5.00	0.00	0.60	0.60
16.75	0.67	0.53	5.00	0.00	0.60	0.60
16.80	0.67	0.53	5.00	0.00	0.60	0.60
16.85	0.67	0.53	5.00	0.00	0.60	0.60
16.90	0.67	0.53	5.00	0.00	0.60	0.60
16.95	0.67	0.53	5.00	0.00	0.60	0.60
17.00	0.67	0.53	5.00	0.00	0.60	0.60
17.05	0.67	0.53	5.00	0.00	0.60	0.60
17.10	0.67	0.53	5.00	0.00	0.60	0.60
17.15	0.67	0.53	5.00	0.00	0.60	0.60

17.20	0.67	0.53	5.00	0.00	0.60	0.60
17.25	0.67	0.53	5.00	0.00	0.59	0.59
17.30	0.67	0.53	5.00	0.00	0.59	0.59
17.35	0.67	0.53	5.00	0.00	0.59	0.59
17.40	0.67	0.53	5.00	0.00	0.59	0.59
17.45	0.67	0.53	5.00	0.00	0.59	0.59
17.50	0.67	0.53	5.00	0.00	0.59	0.59
17.55	0.67	0.53	5.00	0.00	0.59	0.59
17.60	0.67	0.53	5.00	0.00	0.59	0.59
17.65	0.67	0.53	5.00	0.00	0.59	0.59
17.70	0.67	0.53	5.00	0.00	0.59	0.59
17.75	0.67	0.53	5.00	0.00	0.59	0.59
17.80	0.67	0.53	5.00	0.00	0.59	0.59
17.85	0.67	0.53	5.00	0.00	0.58	0.58
17.90	0.67	0.53	5.00	0.00	0.58	0.58
17.95	0.67	0.53	5.00	0.00	0.58	0.58
18.00	0.67	0.53	5.00	0.00	0.58	0.58
18.05	0.67	0.53	5.00	0.00	0.58	0.58
18.10	0.67	0.53	5.00	0.00	0.58	0.58
18.15	0.67	0.53	5.00	0.00	0.58	0.58
18.20	0.67	0.53	5.00	0.00	0.58	0.58
18.25	0.67	0.53	5.00	0.00	0.58	0.58
18.30	0.67	0.53	5.00	0.00	0.58	0.58
18.35	0.67	0.53	5.00	0.00	0.57	0.57
18.40	0.67	0.53	5.00	0.00	0.57	0.57
18.45	0.67	0.53	5.00	0.00	0.57	0.57
18.50	0.67	0.53	5.00	0.00	0.57	0.57
18.55	0.67	0.53	5.00	0.00	0.57	0.57
18.60	0.67	0.53	5.00	0.00	0.57	0.57
18.65	0.67	0.53	5.00	0.00	0.57	0.57
18.70	0.67	0.53	5.00	0.00	0.57	0.57
18.75	0.67	0.53	5.00	0.00	0.57	0.57
18.80	0.67	0.53	5.00	0.00	0.57	0.57
18.85	0.67	0.53	5.00	0.00	0.56	0.56
18.90	0.67	0.53	5.00	0.00	0.56	0.56
18.95	0.67	0.53	5.00	0.00	0.56	0.56
19.00	0.67	0.53	5.00	0.00	0.56	0.56
19.05	0.67	0.53	5.00	0.00	0.56	0.56
19.10	0.67	0.53	5.00	0.00	0.56	0.56
19.15	0.67	0.53	5.00	0.00	0.56	0.56
19.20	0.67	0.53	5.00	0.00	0.56	0.56
19.25	0.67	0.53	5.00	0.00	0.55	0.55
19.30	0.67	0.53	5.00	0.00	0.55	0.55
19.35	0.67	0.53	5.00	0.00	0.55	0.55
19.40	0.67	0.53	5.00	0.00	0.55	0.55
19.45	0.67	0.53	5.00	0.00	0.55	0.55
19.50	0.67	0.53	5.00	0.00	0.55	0.55
19.55	0.67	0.53	5.00	0.00	0.55	0.55
19.60	0.67	0.53	5.00	0.00	0.55	0.55
19.65	0.67	0.53	5.00	0.00	0.55	0.55
19.70	0.67	0.53	5.00	0.00	0.55	0.55
19.75	0.67	0.53	5.00	0.00	0.55	0.55
19.80	0.67	0.53	5.00	0.00	0.55	0.55
19.85	0.67	0.53	5.00	0.00	0.54	0.54
19.90	0.67	0.53	5.00	0.00	0.54	0.54
19.95	0.67	0.53	5.00	0.00	0.54	0.54
20.00	0.67	0.53	5.00	0.00	0.54	0.54
20.05	0.67	0.53	5.00	0.00	0.54	0.54
20.10	0.67	0.53	5.00	0.00	0.54	0.54
20.15	0.67	0.53	5.00	0.00	0.54	0.54
20.20	0.67	0.53	5.00	0.00	0.54	0.54
20.25	0.67	0.53	5.00	0.00	0.54	0.54
20.30	0.67	0.53	5.00	0.00	0.54	0.54
20.35	0.67	0.53	5.00	0.00	0.54	0.54
20.40	0.67	0.53	5.00	0.00	0.54	0.54
20.45	0.67	0.53	5.00	0.00	0.54	0.54
20.50	0.67	0.53	5.00	0.00	0.54	0.54
20.55	0.67	0.53	5.00	0.00	0.54	0.54
20.60	0.67	0.53	5.00	0.00	0.54	0.54
20.65	0.67	0.53	5.00	0.00	0.54	0.54
20.70	0.67	0.53	5.00	0.00	0.54	0.54
20.75	0.67	0.53	5.00	0.00	0.54	0.54
20.80	0.67	0.53	5.00	0.00	0.54	0.54
20.85	0.67	0.53	5.00	0.00	0.54	0.54
20.90	0.67	0.53	5.00	0.00	0.54	0.54
20.95	0.67	0.53	5.00	0.00	0.53	0.53
21.00	0.67	0.53	5.00	0.00	0.53	0.53
21.05	0.67	0.53	5.00	0.00	0.53	0.53
21.10	0.67	0.53	5.00	0.00	0.53	0.53

21.15	0.67	0.53	5.00	0.00	0.53	0.53
21.20	0.67	0.53	5.00	0.00	0.53	0.53
21.25	0.67	0.53	5.00	0.00	0.53	0.53
21.30	0.67	0.53	5.00	0.00	0.53	0.53
21.35	0.67	0.53	5.00	0.00	0.53	0.53
21.40	0.67	0.53	5.00	0.00	0.53	0.53
21.45	0.67	0.53	5.00	0.00	0.53	0.53
21.50	0.67	0.53	5.00	0.00	0.53	0.53
21.55	0.67	0.53	5.00	0.00	0.53	0.53
21.60	0.67	0.53	5.00	0.00	0.53	0.53
21.65	0.67	0.53	5.00	0.00	0.53	0.53
21.70	0.67	0.53	5.00	0.00	0.53	0.53
21.75	0.67	0.53	5.00	0.00	0.53	0.53
21.80	0.67	0.53	5.00	0.00	0.53	0.53
21.85	0.67	0.53	5.00	0.00	0.53	0.53
21.90	0.67	0.53	5.00	0.00	0.53	0.53
21.95	0.67	0.53	5.00	0.00	0.52	0.52
22.00	0.67	0.53	5.00	0.00	0.52	0.52
22.05	0.67	0.53	5.00	0.00	0.52	0.52
22.10	0.67	0.53	5.00	0.00	0.52	0.52
22.15	0.67	0.53	5.00	0.00	0.52	0.52
22.20	0.67	0.53	5.00	0.00	0.52	0.52
22.25	0.67	0.53	5.00	0.00	0.52	0.52
22.30	0.67	0.53	5.00	0.00	0.52	0.52
22.35	0.67	0.53	5.00	0.00	0.52	0.52
22.40	0.67	0.53	5.00	0.00	0.52	0.52
22.45	0.67	0.53	5.00	0.00	0.52	0.52
22.50	0.67	0.53	5.00	0.00	0.52	0.52
22.55	0.67	0.53	5.00	0.00	0.52	0.52
22.60	0.67	0.53	5.00	0.00	0.52	0.52
22.65	0.67	0.53	5.00	0.00	0.52	0.52
22.70	0.67	0.53	5.00	0.00	0.52	0.52
22.75	0.67	0.53	5.00	0.00	0.52	0.52
22.80	0.67	0.53	5.00	0.00	0.52	0.52
22.85	0.67	0.53	5.00	0.00	0.52	0.52
22.90	0.67	0.53	5.00	0.00	0.51	0.51
22.95	0.67	0.53	5.00	0.00	0.51	0.51
23.00	0.67	0.53	5.00	0.00	0.51	0.51
23.05	0.67	0.53	5.00	0.00	0.51	0.51
23.10	0.67	0.53	5.00	0.00	0.51	0.51
23.15	0.67	0.53	5.00	0.00	0.51	0.51
23.20	0.67	0.53	5.00	0.00	0.51	0.51
23.25	0.67	0.53	5.00	0.00	0.51	0.51
23.30	0.67	0.53	5.00	0.00	0.51	0.51
23.35	0.67	0.53	5.00	0.00	0.51	0.51
23.40	0.67	0.53	5.00	0.00	0.51	0.51
23.45	0.67	0.53	5.00	0.00	0.51	0.51
23.50	0.67	0.53	5.00	0.00	0.51	0.51
23.55	0.67	0.53	5.00	0.00	0.51	0.51
23.60	0.67	0.53	5.00	0.00	0.51	0.51
23.65	0.67	0.53	5.00	0.00	0.51	0.51
23.70	0.67	0.53	5.00	0.00	0.51	0.51
23.75	0.67	0.53	5.00	0.00	0.50	0.50
23.80	0.67	0.53	5.00	0.00	0.50	0.50
23.85	0.67	0.53	5.00	0.00	0.50	0.50
23.90	0.67	0.53	5.00	0.00	0.50	0.50
23.95	0.67	0.53	5.00	0.00	0.50	0.50
24.00	0.67	0.53	5.00	0.00	0.50	0.50
24.05	0.67	0.53	5.00	0.00	0.50	0.50
24.10	0.67	0.53	5.00	0.00	0.50	0.50
24.15	0.67	0.52	5.00	0.00	0.50	0.50
24.20	0.67	0.52	5.00	0.00	0.50	0.50
24.25	0.67	0.52	5.00	0.00	0.50	0.50
24.30	0.67	0.52	5.00	0.00	0.50	0.50
24.35	0.67	0.52	5.00	0.00	0.50	0.50
24.40	0.67	0.52	5.00	0.00	0.50	0.50
24.45	0.67	0.52	5.00	0.00	0.50	0.50
24.50	0.67	0.52	5.00	0.00	0.50	0.50
24.55	0.67	0.52	5.00	0.00	0.50	0.50
24.60	0.67	0.52	5.00	0.00	0.49	0.49
24.65	0.67	0.52	5.00	0.00	0.49	0.49
24.70	0.67	0.52	5.00	0.00	0.49	0.49
24.75	0.67	0.52	5.00	0.00	0.49	0.49
24.80	0.67	0.52	5.00	0.00	0.49	0.49
24.85	0.67	0.52	5.00	0.00	0.49	0.49
24.90	0.67	0.52	5.00	0.00	0.49	0.49
24.95	0.67	0.52	5.00	0.00	0.49	0.49
25.00	0.67	0.52	5.00	0.00	0.49	0.49
25.05	0.67	0.52	5.00	0.00	0.49	0.49

25.10	0.67	0.52	5.00	0.00	0.49	0.49
25.15	0.67	0.52	5.00	0.00	0.49	0.49
25.20	0.67	0.52	5.00	0.00	0.49	0.49
25.25	0.67	0.52	5.00	0.00	0.49	0.49
25.30	0.67	0.52	5.00	0.00	0.49	0.49
25.35	0.67	0.52	5.00	0.00	0.49	0.49
25.40	0.67	0.52	5.00	0.00	0.48	0.48
25.45	0.67	0.52	5.00	0.00	0.48	0.48
25.50	0.67	0.52	5.00	0.00	0.48	0.48
25.55	0.67	0.52	5.00	0.00	0.48	0.48
25.60	0.67	0.52	5.00	0.00	0.48	0.48
25.65	0.67	0.52	5.00	0.00	0.48	0.48
25.70	0.67	0.52	5.00	0.00	0.48	0.48
25.75	0.67	0.52	5.00	0.00	0.48	0.48
25.80	0.67	0.52	5.00	0.00	0.48	0.48
25.85	0.67	0.52	5.00	0.00	0.48	0.48
25.90	0.67	0.52	5.00	0.00	0.48	0.48
25.95	0.67	0.52	5.00	0.00	0.48	0.48
26.00	0.67	0.52	5.00	0.00	0.48	0.48
26.05	0.67	0.52	5.00	0.00	0.48	0.48
26.10	0.67	0.52	5.00	0.00	0.48	0.48
26.15	0.67	0.52	5.00	0.00	0.48	0.48
26.20	0.67	0.52	5.00	0.00	0.47	0.47
26.25	0.67	0.52	5.00	0.00	0.47	0.47
26.30	0.67	0.52	5.00	0.00	0.47	0.47
26.35	0.67	0.52	5.00	0.00	0.47	0.47
26.40	0.67	0.52	5.00	0.00	0.47	0.47
26.45	0.67	0.52	5.00	0.00	0.47	0.47
26.50	0.67	0.52	5.00	0.00	0.47	0.47
26.55	0.67	0.52	5.00	0.00	0.47	0.47
26.60	0.67	0.52	5.00	0.00	0.47	0.47
26.65	0.67	0.52	5.00	0.00	0.47	0.47
26.70	0.67	0.52	5.00	0.00	0.47	0.47
26.75	0.67	0.52	5.00	0.00	0.47	0.47
26.80	0.67	0.52	5.00	0.00	0.47	0.47
26.85	0.67	0.52	5.00	0.00	0.47	0.47
26.90	0.67	0.52	5.00	0.00	0.47	0.47
26.95	0.67	0.52	5.00	0.00	0.47	0.47
27.00	0.67	0.52	5.00	0.00	0.46	0.46
27.05	0.67	0.52	5.00	0.00	0.46	0.46
27.10	0.67	0.52	5.00	0.00	0.46	0.46
27.15	0.67	0.52	5.00	0.00	0.46	0.46
27.20	0.67	0.52	5.00	0.00	0.46	0.46
27.25	0.67	0.52	5.00	0.00	0.46	0.46
27.30	0.67	0.52	5.00	0.00	0.46	0.46
27.35	0.67	0.52	5.00	0.00	0.46	0.46
27.40	0.67	0.52	5.00	0.00	0.46	0.46
27.45	0.67	0.52	5.00	0.00	0.46	0.46
27.50	0.67	0.52	5.00	0.00	0.46	0.46
27.55	0.67	0.52	5.00	0.00	0.46	0.46
27.60	0.67	0.52	5.00	0.00	0.46	0.46
27.65	0.67	0.52	5.00	0.00	0.46	0.46
27.70	0.66	0.52	5.00	0.00	0.45	0.45
27.75	0.66	0.52	5.00	0.00	0.45	0.45
27.80	0.66	0.52	5.00	0.00	0.45	0.45
27.85	0.66	0.52	5.00	0.00	0.45	0.45
27.90	0.66	0.52	5.00	0.00	0.45	0.45
27.95	0.66	0.52	5.00	0.00	0.45	0.45
28.00	0.66	0.52	5.00	0.00	0.45	0.45
28.05	0.66	0.52	5.00	0.00	0.45	0.45
28.10	0.66	0.52	5.00	0.00	0.45	0.45
28.15	0.66	0.52	5.00	0.00	0.45	0.45
28.20	0.66	0.52	5.00	0.00	0.45	0.45
28.25	0.66	0.52	5.00	0.00	0.45	0.45
28.30	0.66	0.52	5.00	0.00	0.45	0.45
28.35	0.66	0.52	5.00	0.00	0.44	0.44
28.40	0.66	0.52	5.00	0.00	0.44	0.44
28.45	0.66	0.52	5.00	0.00	0.44	0.44
28.50	0.66	0.52	5.00	0.00	0.44	0.44
28.55	0.66	0.52	5.00	0.00	0.44	0.44
28.60	0.66	0.52	5.00	0.00	0.44	0.44
28.65	0.66	0.52	5.00	0.00	0.44	0.44
28.70	0.66	0.52	5.00	0.00	0.44	0.44
28.75	0.66	0.52	5.00	0.00	0.44	0.44
28.80	0.66	0.52	5.00	0.00	0.44	0.44
28.85	0.66	0.52	5.00	0.00	0.44	0.44
28.90	0.66	0.52	5.00	0.00	0.44	0.44
28.95	0.66	0.52	5.00	0.00	0.44	0.44
29.00	0.66	0.52	5.00	0.00	0.43	0.43

29.05	0.66	0.52	5.00	0.00	0.43	0.43
29.10	0.66	0.52	5.00	0.00	0.43	0.43
29.15	0.66	0.52	5.00	0.00	0.43	0.43
29.20	0.66	0.52	5.00	0.00	0.43	0.43
29.25	0.66	0.52	5.00	0.00	0.43	0.43
29.30	0.66	0.52	5.00	0.00	0.43	0.43
29.35	0.66	0.52	5.00	0.00	0.43	0.43
29.40	0.66	0.52	5.00	0.00	0.43	0.43
29.45	0.66	0.52	5.00	0.00	0.43	0.43
29.50	0.66	0.52	5.00	0.00	0.43	0.43
29.55	0.66	0.52	5.00	0.00	0.42	0.42
29.60	0.66	0.52	5.00	0.00	0.42	0.42
29.65	0.66	0.52	5.00	0.00	0.42	0.42
29.70	0.66	0.52	5.00	0.00	0.42	0.42
29.75	0.66	0.52	5.00	0.00	0.42	0.42
29.80	0.66	0.52	5.00	0.00	0.42	0.42
29.85	0.66	0.52	5.00	0.00	0.42	0.42
29.90	0.66	0.52	5.00	0.00	0.42	0.42
29.95	0.66	0.52	5.00	0.00	0.42	0.42
30.00	0.66	0.52	5.00	0.00	0.42	0.42
30.05	2.00	0.52	5.00	0.00	0.42	0.42
30.10	2.00	0.52	5.00	0.00	0.42	0.42
30.15	2.00	0.52	5.00	0.00	0.42	0.42
30.20	2.00	0.52	5.00	0.00	0.42	0.42
30.25	2.00	0.52	5.00	0.00	0.42	0.42
30.30	2.00	0.52	5.00	0.00	0.42	0.42
30.35	2.00	0.52	5.00	0.00	0.42	0.42
30.40	2.00	0.52	5.00	0.00	0.42	0.42
30.45	2.00	0.52	5.00	0.00	0.42	0.42
30.50	2.00	0.51	5.00	0.00	0.42	0.42
30.55	2.00	0.51	5.00	0.00	0.42	0.42
30.60	2.00	0.51	5.00	0.00	0.42	0.42
30.65	2.00	0.51	5.00	0.00	0.42	0.42
30.70	2.00	0.51	5.00	0.00	0.42	0.42
30.75	2.00	0.51	5.00	0.00	0.42	0.42
30.80	2.00	0.51	5.00	0.00	0.42	0.42
30.85	2.00	0.51	5.00	0.00	0.42	0.42
30.90	2.00	0.51	5.00	0.00	0.42	0.42
30.95	2.00	0.51	5.00	0.00	0.42	0.42
31.00	2.00	0.51	5.00	0.00	0.42	0.42
31.05	2.00	0.51	5.00	0.00	0.42	0.42
31.10	2.00	0.51	5.00	0.00	0.42	0.42
31.15	2.00	0.51	5.00	0.00	0.42	0.42
31.20	2.00	0.51	5.00	0.00	0.42	0.42
31.25	2.00	0.51	5.00	0.00	0.42	0.42
31.30	2.00	0.51	5.00	0.00	0.42	0.42
31.35	2.00	0.51	5.00	0.00	0.42	0.42
31.40	2.00	0.51	5.00	0.00	0.42	0.42
31.45	2.00	0.51	5.00	0.00	0.42	0.42
31.50	2.00	0.51	5.00	0.00	0.42	0.42
31.55	2.00	0.51	5.00	0.00	0.42	0.42
31.60	2.00	0.51	5.00	0.00	0.42	0.42
31.65	2.00	0.51	5.00	0.00	0.42	0.42
31.70	2.00	0.51	5.00	0.00	0.42	0.42
31.75	2.00	0.51	5.00	0.00	0.42	0.42
31.80	2.00	0.51	5.00	0.00	0.42	0.42
31.85	2.00	0.51	5.00	0.00	0.42	0.42
31.90	2.00	0.51	5.00	0.00	0.42	0.42
31.95	2.00	0.51	5.00	0.00	0.42	0.42
32.00	2.00	0.51	5.00	0.00	0.42	0.42
32.05	2.00	0.51	5.00	0.00	0.42	0.42
32.10	2.00	0.51	5.00	0.00	0.42	0.42
32.15	2.00	0.51	5.00	0.00	0.42	0.42
32.20	2.00	0.51	5.00	0.00	0.42	0.42
32.25	2.00	0.51	5.00	0.00	0.42	0.42
32.30	2.00	0.51	5.00	0.00	0.42	0.42
32.35	2.00	0.51	5.00	0.00	0.42	0.42
32.40	2.00	0.51	5.00	0.00	0.42	0.42
32.45	2.00	0.51	5.00	0.00	0.42	0.42
32.50	2.00	0.51	5.00	0.00	0.42	0.42
32.55	2.00	0.51	5.00	0.00	0.42	0.42
32.60	2.00	0.51	5.00	0.00	0.42	0.42
32.65	2.00	0.51	5.00	0.00	0.42	0.42
32.70	2.00	0.51	5.00	0.00	0.42	0.42
32.75	2.00	0.50	5.00	0.00	0.42	0.42
32.80	2.00	0.50	5.00	0.00	0.42	0.42
32.85	2.00	0.50	5.00	0.00	0.42	0.42
32.90	2.00	0.50	5.00	0.00	0.42	0.42
32.95	2.00	0.50	5.00	0.00	0.42	0.42

33.00	2.00	0.50	5.00	0.00	0.42	0.42
33.05	2.00	0.50	5.00	0.00	0.42	0.42
33.10	2.00	0.50	5.00	0.00	0.42	0.42
33.15	2.00	0.50	5.00	0.00	0.42	0.42
33.20	2.00	0.50	5.00	0.00	0.42	0.42
33.25	2.00	0.50	5.00	0.00	0.42	0.42
33.30	2.00	0.50	5.00	0.00	0.42	0.42
33.35	2.00	0.50	5.00	0.00	0.42	0.42
33.40	2.00	0.50	5.00	0.00	0.42	0.42
33.45	2.00	0.50	5.00	0.00	0.42	0.42
33.50	2.00	0.50	5.00	0.00	0.42	0.42
33.55	2.00	0.50	5.00	0.00	0.42	0.42
33.60	2.00	0.50	5.00	0.00	0.42	0.42
33.65	2.00	0.50	5.00	0.00	0.42	0.42
33.70	2.00	0.50	5.00	0.00	0.42	0.42
33.75	2.00	0.50	5.00	0.00	0.42	0.42
33.80	2.00	0.50	5.00	0.00	0.42	0.42
33.85	2.00	0.50	5.00	0.00	0.42	0.42
33.90	2.00	0.50	5.00	0.00	0.42	0.42
33.95	2.00	0.50	5.00	0.00	0.42	0.42
34.00	2.00	0.50	5.00	0.00	0.42	0.42
34.05	0.64	0.50	5.00	0.00	0.42	0.42
34.10	0.64	0.50	5.00	0.00	0.42	0.42
34.15	0.64	0.50	5.00	0.00	0.42	0.42
34.20	0.64	0.50	5.00	0.00	0.41	0.41
34.25	0.64	0.50	5.00	0.00	0.41	0.41
34.30	0.64	0.50	5.00	0.00	0.41	0.41
34.35	0.64	0.50	5.00	0.00	0.41	0.41
34.40	0.64	0.50	5.00	0.00	0.41	0.41
34.45	0.64	0.50	5.00	0.00	0.41	0.41
34.50	0.64	0.50	5.00	0.00	0.41	0.41
34.55	0.64	0.50	5.00	0.00	0.41	0.41
34.60	0.64	0.50	5.00	0.00	0.41	0.41
34.65	0.64	0.50	5.00	0.00	0.41	0.41
34.70	0.64	0.50	5.00	0.00	0.41	0.41
34.75	0.64	0.50	5.00	0.00	0.40	0.40
34.80	0.64	0.50	5.00	0.00	0.40	0.40
34.85	0.64	0.50	5.00	0.00	0.40	0.40
34.90	0.64	0.50	5.00	0.00	0.40	0.40
34.95	0.64	0.49	5.00	0.00	0.40	0.40
35.00	0.64	0.49	5.00	0.00	0.40	0.40
35.05	0.64	0.49	5.00	0.00	0.40	0.40
35.10	0.64	0.49	5.00	0.00	0.40	0.40
35.15	0.64	0.49	5.00	0.00	0.40	0.40
35.20	0.64	0.49	5.00	0.00	0.39	0.39
35.25	0.64	0.49	5.00	0.00	0.39	0.39
35.30	0.64	0.49	5.00	0.00	0.39	0.39
35.35	0.64	0.49	5.00	0.00	0.39	0.39
35.40	0.64	0.49	5.00	0.00	0.39	0.39
35.45	0.64	0.49	5.00	0.00	0.39	0.39
35.50	0.64	0.49	5.00	0.00	0.39	0.39
35.55	0.64	0.49	5.00	0.00	0.39	0.39
35.60	0.64	0.49	5.00	0.00	0.39	0.39
35.65	0.64	0.49	5.00	0.00	0.39	0.39
35.70	0.64	0.49	5.00	0.00	0.38	0.38
35.75	0.64	0.49	5.00	0.00	0.38	0.38
35.80	0.64	0.49	5.00	0.00	0.38	0.38
35.85	0.64	0.49	5.00	0.00	0.38	0.38
35.90	0.64	0.49	5.00	0.00	0.38	0.38
35.95	0.64	0.49	5.00	0.00	0.38	0.38
36.00	0.64	0.49	5.00	0.00	0.38	0.38
36.05	0.64	0.49	5.00	0.00	0.38	0.38
36.10	0.63	0.49	5.00	0.00	0.37	0.37
36.15	0.63	0.49	5.00	0.00	0.37	0.37
36.20	0.63	0.49	5.00	0.00	0.37	0.37
36.25	0.63	0.49	5.00	0.00	0.37	0.37
36.30	0.63	0.49	5.00	0.00	0.37	0.37
36.35	0.63	0.49	5.00	0.00	0.37	0.37
36.40	0.63	0.49	5.00	0.00	0.37	0.37
36.45	0.63	0.49	5.00	0.00	0.37	0.37
36.50	0.63	0.49	5.00	0.00	0.37	0.37
36.55	0.63	0.49	5.00	0.00	0.36	0.36
36.60	0.63	0.49	5.00	0.00	0.36	0.36
36.65	0.63	0.49	5.00	0.00	0.36	0.36
36.70	0.63	0.49	5.00	0.00	0.36	0.36
36.75	0.63	0.49	5.00	0.00	0.36	0.36
36.80	0.63	0.49	5.00	0.00	0.36	0.36
36.85	0.63	0.49	5.00	0.00	0.36	0.36
36.90	0.63	0.49	5.00	0.00	0.36	0.36

36.95	0.63	0.49	5.00	0.00	0.36	0.36
37.00	0.63	0.49	5.00	0.00	0.35	0.35
37.05	0.63	0.49	5.00	0.00	0.35	0.35
37.10	0.63	0.49	5.00	0.00	0.35	0.35
37.15	0.63	0.48	5.00	0.00	0.35	0.35
37.20	0.63	0.48	5.00	0.00	0.35	0.35
37.25	0.63	0.48	5.00	0.00	0.35	0.35
37.30	0.63	0.48	5.00	0.00	0.35	0.35
37.35	0.63	0.48	5.00	0.00	0.35	0.35
37.40	0.63	0.48	5.00	0.00	0.34	0.34
37.45	0.63	0.48	5.00	0.00	0.34	0.34
37.50	0.63	0.48	5.00	0.00	0.34	0.34
37.55	0.63	0.48	5.00	0.00	0.34	0.34
37.60	0.63	0.48	5.00	0.00	0.34	0.34
37.65	0.63	0.48	5.00	0.00	0.34	0.34
37.70	0.63	0.48	5.00	0.00	0.34	0.34
37.75	0.63	0.48	5.00	0.00	0.34	0.34
37.80	0.63	0.48	5.00	0.00	0.33	0.33
37.85	0.63	0.48	5.00	0.00	0.33	0.33
37.90	0.63	0.48	5.00	0.00	0.33	0.33
37.95	0.63	0.48	5.00	0.00	0.33	0.33
38.00	0.63	0.48	5.00	0.00	0.33	0.33
38.05	0.63	0.48	5.00	0.00	0.33	0.33
38.10	0.63	0.48	5.00	0.00	0.33	0.33
38.15	0.63	0.48	5.00	0.00	0.32	0.32
38.20	0.63	0.48	5.00	0.00	0.32	0.32
38.25	0.63	0.48	5.00	0.00	0.32	0.32
38.30	0.63	0.48	5.00	0.00	0.32	0.32
38.35	0.63	0.48	5.00	0.00	0.32	0.32
38.40	0.63	0.48	5.00	0.00	0.32	0.32
38.45	0.63	0.48	5.00	0.00	0.32	0.32
38.50	0.63	0.48	5.00	0.00	0.31	0.31
38.55	0.63	0.48	5.00	0.00	0.31	0.31
38.60	0.63	0.48	5.00	0.00	0.31	0.31
38.65	0.63	0.48	5.00	0.00	0.31	0.31
38.70	0.63	0.48	5.00	0.00	0.31	0.31
38.75	0.63	0.48	5.00	0.00	0.31	0.31
38.80	0.63	0.48	5.00	0.00	0.31	0.31
38.85	0.63	0.48	5.00	0.00	0.30	0.30
38.90	0.62	0.48	5.00	0.00	0.30	0.30
38.95	0.62	0.48	5.00	0.00	0.30	0.30
39.00	0.62	0.48	5.00	0.00	0.30	0.30
39.05	0.62	0.48	5.00	0.00	0.30	0.30
39.10	0.62	0.48	5.00	0.00	0.30	0.30
39.15	0.62	0.48	5.00	0.00	0.30	0.30
39.20	0.62	0.48	5.00	0.00	0.29	0.29
39.25	0.62	0.48	5.00	0.00	0.29	0.29
39.30	0.62	0.48	5.00	0.00	0.29	0.29
39.35	0.62	0.47	5.00	0.00	0.29	0.29
39.40	0.62	0.47	5.00	0.00	0.29	0.29
39.45	0.62	0.47	5.00	0.00	0.29	0.29
39.50	0.62	0.47	5.00	0.00	0.28	0.28
39.55	0.62	0.47	5.00	0.00	0.28	0.28
39.60	0.62	0.47	5.00	0.00	0.28	0.28
39.65	0.62	0.47	5.00	0.00	0.28	0.28
39.70	0.62	0.47	5.00	0.00	0.28	0.28
39.75	0.62	0.47	5.00	0.00	0.28	0.28
39.80	0.62	0.47	5.00	0.00	0.28	0.28
39.85	0.62	0.47	5.00	0.00	0.28	0.28
39.90	0.62	0.47	5.00	0.00	0.27	0.27
39.95	0.62	0.47	5.00	0.00	0.27	0.27
40.00	0.62	0.47	5.00	0.00	0.27	0.27
40.05	0.62	0.47	5.00	0.00	0.27	0.27
40.10	0.62	0.47	5.00	0.00	0.27	0.27
40.15	0.62	0.47	5.00	0.00	0.27	0.27
40.20	0.62	0.47	5.00	0.00	0.27	0.27
40.25	0.62	0.47	5.00	0.00	0.27	0.27
40.30	0.62	0.47	5.00	0.00	0.27	0.27
40.35	0.62	0.47	5.00	0.00	0.27	0.27
40.40	0.62	0.47	5.00	0.00	0.27	0.27
40.45	0.62	0.47	5.00	0.00	0.27	0.27
40.50	0.62	0.47	5.00	0.00	0.26	0.26
40.55	0.62	0.47	5.00	0.00	0.26	0.26
40.60	0.62	0.47	5.00	0.00	0.26	0.26
40.65	0.62	0.47	5.00	0.00	0.26	0.26
40.70	0.62	0.47	5.00	0.00	0.26	0.26
40.75	0.62	0.47	5.00	0.00	0.26	0.26
40.80	0.62	0.47	5.00	0.00	0.26	0.26
40.85	0.62	0.47	5.00	0.00	0.26	0.26

40.90	0.62	0.47	5.00	0.00	0.26	0.26
40.95	0.62	0.47	5.00	0.00	0.26	0.26
41.00	0.62	0.47	5.00	0.00	0.26	0.26
41.05	0.62	0.47	5.00	0.00	0.26	0.26
41.10	0.62	0.47	5.00	0.00	0.26	0.26
41.15	0.62	0.47	5.00	0.00	0.26	0.26
41.20	0.62	0.47	5.00	0.00	0.25	0.25
41.25	0.62	0.47	5.00	0.00	0.25	0.25
41.30	0.62	0.47	5.00	0.00	0.25	0.25
41.35	0.62	0.47	5.00	0.00	0.25	0.25
41.40	0.62	0.47	5.00	0.00	0.25	0.25
41.45	0.62	0.47	5.00	0.00	0.25	0.25
41.50	0.62	0.47	5.00	0.00	0.25	0.25
41.55	0.62	0.46	5.00	0.00	0.25	0.25
41.60	0.62	0.46	5.00	0.00	0.25	0.25
41.65	0.62	0.46	5.00	0.00	0.25	0.25
41.70	0.62	0.46	5.00	0.00	0.25	0.25
41.75	0.62	0.46	5.00	0.00	0.25	0.25
41.80	0.62	0.46	5.00	0.00	0.25	0.25
41.85	0.61	0.46	5.00	0.00	0.25	0.25
41.90	0.61	0.46	5.00	0.00	0.24	0.24
41.95	0.61	0.46	5.00	0.00	0.24	0.24
42.00	0.61	0.46	5.00	0.00	0.24	0.24
42.05	0.61	0.46	5.00	0.00	0.24	0.24
42.10	0.61	0.46	5.00	0.00	0.24	0.24
42.15	0.61	0.46	5.00	0.00	0.24	0.24
42.20	0.61	0.46	5.00	0.00	0.24	0.24
42.25	0.61	0.46	5.00	0.00	0.24	0.24
42.30	0.61	0.46	5.00	0.00	0.24	0.24
42.35	0.61	0.46	5.00	0.00	0.24	0.24
42.40	0.61	0.46	5.00	0.00	0.24	0.24
42.45	0.61	0.46	5.00	0.00	0.24	0.24
42.50	0.61	0.46	5.00	0.00	0.24	0.24
42.55	0.61	0.46	5.00	0.00	0.24	0.24
42.60	0.61	0.46	5.00	0.00	0.24	0.24
42.65	0.61	0.46	5.00	0.00	0.24	0.24
42.70	0.61	0.46	5.00	0.00	0.23	0.23
42.75	0.61	0.46	5.00	0.00	0.23	0.23
42.80	0.61	0.46	5.00	0.00	0.23	0.23
42.85	0.61	0.46	5.00	0.00	0.23	0.23
42.90	0.61	0.46	5.00	0.00	0.23	0.23
42.95	0.61	0.46	5.00	0.00	0.23	0.23
43.00	0.61	0.46	5.00	0.00	0.23	0.23
43.05	0.61	0.46	5.00	0.00	0.23	0.23
43.10	0.61	0.46	5.00	0.00	0.23	0.23
43.15	0.61	0.46	5.00	0.00	0.23	0.23
43.20	0.61	0.46	5.00	0.00	0.23	0.23
43.25	0.61	0.46	5.00	0.00	0.23	0.23
43.30	0.61	0.46	5.00	0.00	0.23	0.23
43.35	0.61	0.46	5.00	0.00	0.23	0.23
43.40	0.61	0.46	5.00	0.00	0.23	0.23
43.45	0.61	0.46	5.00	0.00	0.23	0.23
43.50	0.61	0.46	5.00	0.00	0.22	0.22
43.55	0.61	0.46	5.00	0.00	0.22	0.22
43.60	0.61	0.46	5.00	0.00	0.22	0.22
43.65	0.61	0.46	5.00	0.00	0.22	0.22
43.70	0.61	0.46	5.00	0.00	0.22	0.22
43.75	0.61	0.46	5.00	0.00	0.22	0.22
43.80	0.61	0.45	5.00	0.00	0.22	0.22
43.85	0.61	0.45	5.00	0.00	0.22	0.22
43.90	0.61	0.45	5.00	0.00	0.22	0.22
43.95	0.61	0.45	5.00	0.00	0.22	0.22
44.00	0.61	0.45	5.00	0.00	0.22	0.22
44.05	0.61	0.45	5.00	0.00	0.22	0.22
44.10	0.61	0.45	5.00	0.00	0.22	0.22
44.15	0.61	0.45	5.00	0.00	0.22	0.22
44.20	0.61	0.45	5.00	0.00	0.22	0.22
44.25	0.61	0.45	5.00	0.00	0.22	0.22
44.30	0.61	0.45	5.00	0.00	0.22	0.22
44.35	0.61	0.45	5.00	0.00	0.21	0.21
44.40	0.61	0.45	5.00	0.00	0.21	0.21
44.45	0.61	0.45	5.00	0.00	0.21	0.21
44.50	0.61	0.45	5.00	0.00	0.21	0.21
44.55	0.61	0.45	5.00	0.00	0.21	0.21
44.60	0.61	0.45	5.00	0.00	0.21	0.21
44.65	0.61	0.45	5.00	0.00	0.21	0.21
44.70	0.61	0.45	5.00	0.00	0.21	0.21
44.75	0.61	0.45	5.00	0.00	0.21	0.21
44.80	0.61	0.45	5.00	0.00	0.21	0.21

44.85	0.61	0.45	5.00	0.00	0.21	0.21
44.90	0.61	0.45	5.00	0.00	0.21	0.21
44.95	0.60	0.45	5.00	0.00	0.21	0.21
45.00	0.60	0.45	5.00	0.00	0.21	0.21
45.05	0.60	0.45	5.00	0.00	0.21	0.21
45.10	0.60	0.45	5.00	0.00	0.21	0.21
45.15	0.60	0.45	5.00	0.00	0.21	0.21
45.20	0.60	0.45	5.00	0.00	0.20	0.20
45.25	0.60	0.45	5.00	0.00	0.20	0.20
45.30	0.60	0.45	5.00	0.00	0.20	0.20
45.35	0.60	0.45	5.00	0.00	0.20	0.20
45.40	0.60	0.45	5.00	0.00	0.20	0.20
45.45	0.60	0.45	5.00	0.00	0.20	0.20
45.50	0.60	0.45	5.00	0.00	0.20	0.20
45.55	0.60	0.45	5.00	0.00	0.20	0.20
45.60	0.60	0.45	5.00	0.00	0.20	0.20
45.65	0.60	0.45	5.00	0.00	0.20	0.20
45.70	0.60	0.45	5.00	0.00	0.20	0.20
45.75	0.60	0.45	5.00	0.00	0.20	0.20
45.80	0.60	0.45	5.00	0.00	0.20	0.20
45.85	0.60	0.45	5.00	0.00	0.20	0.20
45.90	0.60	0.45	5.00	0.00	0.20	0.20
45.95	0.60	0.45	5.00	0.00	0.20	0.20
46.00	0.60	0.44	5.00	0.00	0.20	0.20
46.05	0.60	0.44	5.00	0.00	0.19	0.19
46.10	0.60	0.44	5.00	0.00	0.19	0.19
46.15	0.60	0.44	5.00	0.00	0.19	0.19
46.20	0.60	0.44	5.00	0.00	0.19	0.19
46.25	0.60	0.44	5.00	0.00	0.19	0.19
46.30	0.60	0.44	5.00	0.00	0.19	0.19
46.35	0.60	0.44	5.00	0.00	0.19	0.19
46.40	0.60	0.44	5.00	0.00	0.19	0.19
46.45	0.60	0.44	5.00	0.00	0.19	0.19
46.50	0.60	0.44	5.00	0.00	0.19	0.19
46.55	0.60	0.44	5.00	0.00	0.19	0.19
46.60	0.60	0.44	5.00	0.00	0.19	0.19
46.65	0.60	0.44	5.00	0.00	0.19	0.19
46.70	0.60	0.44	5.00	0.00	0.19	0.19
46.75	0.60	0.44	5.00	0.00	0.19	0.19
46.80	0.60	0.44	5.00	0.00	0.19	0.19
46.85	0.60	0.44	5.00	0.00	0.19	0.19
46.90	0.60	0.44	5.00	0.00	0.19	0.19
46.95	0.60	0.44	5.00	0.00	0.19	0.19
47.00	0.60	0.44	5.00	0.00	0.18	0.18
47.05	2.00	0.44	5.00	0.00	0.18	0.18
47.10	2.00	0.44	5.00	0.00	0.18	0.18
47.15	2.00	0.44	5.00	0.00	0.18	0.18
47.20	2.00	0.44	5.00	0.00	0.18	0.18
47.25	2.00	0.44	5.00	0.00	0.18	0.18
47.30	2.00	0.44	5.00	0.00	0.18	0.18
47.35	2.00	0.44	5.00	0.00	0.18	0.18
47.40	2.00	0.44	5.00	0.00	0.18	0.18
47.45	2.00	0.44	5.00	0.00	0.18	0.18
47.50	2.00	0.44	5.00	0.00	0.18	0.18
47.55	2.00	0.44	5.00	0.00	0.18	0.18
47.60	2.00	0.44	5.00	0.00	0.18	0.18
47.65	2.00	0.44	5.00	0.00	0.18	0.18
47.70	2.00	0.44	5.00	0.00	0.18	0.18
47.75	2.00	0.44	5.00	0.00	0.18	0.18
47.80	2.00	0.44	5.00	0.00	0.18	0.18
47.85	2.00	0.44	5.00	0.00	0.18	0.18
47.90	2.00	0.44	5.00	0.00	0.18	0.18
47.95	2.00	0.44	5.00	0.00	0.18	0.18
48.00	2.00	0.44	5.00	0.00	0.18	0.18
48.05	2.00	0.44	5.00	0.00	0.18	0.18
48.10	2.00	0.44	5.00	0.00	0.18	0.18
48.15	2.00	0.44	5.00	0.00	0.18	0.18
48.20	2.00	0.43	5.00	0.00	0.18	0.18
48.25	2.00	0.43	5.00	0.00	0.18	0.18
48.30	2.00	0.43	5.00	0.00	0.18	0.18
48.35	2.00	0.43	5.00	0.00	0.18	0.18
48.40	2.00	0.43	5.00	0.00	0.18	0.18
48.45	2.00	0.43	5.00	0.00	0.18	0.18
48.50	2.00	0.43	5.00	0.00	0.18	0.18
48.55	2.00	0.43	5.00	0.00	0.18	0.18
48.60	2.00	0.43	5.00	0.00	0.18	0.18
48.65	2.00	0.43	5.00	0.00	0.18	0.18
48.70	2.00	0.43	5.00	0.00	0.18	0.18
48.75	2.00	0.43	5.00	0.00	0.18	0.18

48.80	2.00	0.43	5.00	0.00	0.18	0.18
48.85	2.00	0.43	5.00	0.00	0.18	0.18
48.90	2.00	0.43	5.00	0.00	0.18	0.18
48.95	2.00	0.43	5.00	0.00	0.18	0.18
49.00	2.00	0.43	5.00	0.00	0.18	0.18
49.05	2.00	0.43	5.00	0.00	0.18	0.18
49.10	2.00	0.43	5.00	0.00	0.18	0.18
49.15	2.00	0.43	5.00	0.00	0.18	0.18
49.20	2.00	0.43	5.00	0.00	0.18	0.18
49.25	2.00	0.43	5.00	0.00	0.18	0.18
49.30	2.00	0.43	5.00	0.00	0.18	0.18
49.35	2.00	0.43	5.00	0.00	0.18	0.18
49.40	2.00	0.43	5.00	0.00	0.18	0.18
49.45	2.00	0.43	5.00	0.00	0.18	0.18
49.50	2.00	0.43	5.00	0.00	0.18	0.18
49.55	2.00	0.43	5.00	0.00	0.18	0.18
49.60	2.00	0.43	5.00	0.00	0.18	0.18
49.65	2.00	0.43	5.00	0.00	0.18	0.18
49.70	2.00	0.43	5.00	0.00	0.18	0.18
49.75	2.00	0.43	5.00	0.00	0.18	0.18
49.80	2.00	0.43	5.00	0.00	0.18	0.18
49.85	2.00	0.43	5.00	0.00	0.18	0.18
49.90	2.00	0.43	5.00	0.00	0.18	0.18
49.95	2.00	0.43	5.00	0.00	0.18	0.18
50.00	2.00	0.43	5.00	0.00	0.18	0.18
50.05	2.00	0.43	5.00	0.00	0.18	0.18
50.10	2.00	0.43	5.00	0.00	0.18	0.18
50.15	2.00	0.43	5.00	0.00	0.18	0.18
50.20	2.00	0.43	5.00	0.00	0.18	0.18
50.25	2.00	0.43	5.00	0.00	0.18	0.18
50.30	2.00	0.43	5.00	0.00	0.18	0.18
50.35	2.00	0.43	5.00	0.00	0.18	0.18
50.40	2.00	0.42	5.00	0.00	0.18	0.18
50.45	2.00	0.42	5.00	0.00	0.18	0.18
50.50	2.00	0.42	5.00	0.00	0.18	0.18
50.55	2.00	0.42	5.00	0.00	0.18	0.18
50.60	2.00	0.42	5.00	0.00	0.18	0.18
50.65	2.00	0.42	5.00	0.00	0.18	0.18
50.70	2.00	0.42	5.00	0.00	0.18	0.18
50.75	2.00	0.42	5.00	0.00	0.18	0.18
50.80	2.00	0.42	5.00	0.00	0.18	0.18
50.85	2.00	0.42	5.00	0.00	0.18	0.18
50.90	2.00	0.42	5.00	0.00	0.18	0.18
50.95	2.00	0.42	5.00	0.00	0.18	0.18
51.00	2.00	0.42	5.00	0.00	0.18	0.18
51.05	2.00	0.42	5.00	0.00	0.18	0.18
51.10	2.00	0.42	5.00	0.00	0.18	0.18
51.15	2.00	0.42	5.00	0.00	0.18	0.18
51.20	2.00	0.42	5.00	0.00	0.18	0.18
51.25	2.00	0.42	5.00	0.00	0.18	0.18
51.30	2.00	0.42	5.00	0.00	0.18	0.18
51.35	2.00	0.42	5.00	0.00	0.18	0.18
51.40	2.00	0.42	5.00	0.00	0.18	0.18
51.45	2.00	0.42	5.00	0.00	0.18	0.18
51.50	2.00	0.42	5.00	0.00	0.18	0.18
51.55	2.00	0.42	5.00	0.00	0.18	0.18
51.60	2.00	0.42	5.00	0.00	0.18	0.18
51.65	2.00	0.42	5.00	0.00	0.18	0.18
51.70	2.00	0.42	5.00	0.00	0.18	0.18
51.75	2.00	0.42	5.00	0.00	0.18	0.18
51.80	2.00	0.42	5.00	0.00	0.18	0.18
51.85	2.00	0.42	5.00	0.00	0.18	0.18
51.90	2.00	0.42	5.00	0.00	0.18	0.18
51.95	2.00	0.42	5.00	0.00	0.18	0.18
52.00	2.00	0.42	5.00	0.00	0.18	0.18
52.05	2.00	0.42	5.00	0.00	0.18	0.18
52.10	2.00	0.42	5.00	0.00	0.18	0.18
52.15	2.00	0.42	5.00	0.00	0.18	0.18
52.20	2.00	0.42	5.00	0.00	0.18	0.18
52.25	2.00	0.42	5.00	0.00	0.18	0.18
52.30	2.00	0.42	5.00	0.00	0.18	0.18
52.35	2.00	0.42	5.00	0.00	0.18	0.18
52.40	2.00	0.42	5.00	0.00	0.18	0.18
52.45	2.00	0.42	5.00	0.00	0.18	0.18
52.50	2.00	0.42	5.00	0.00	0.18	0.18
52.55	2.00	0.42	5.00	0.00	0.18	0.18
52.60	2.00	0.41	5.00	0.00	0.18	0.18
52.65	2.00	0.41	5.00	0.00	0.18	0.18
52.70	2.00	0.41	5.00	0.00	0.18	0.18

52.75	2.00	0.41	5.00	0.00	0.18	0.18
52.80	2.00	0.41	5.00	0.00	0.18	0.18
52.85	2.00	0.41	5.00	0.00	0.18	0.18
52.90	2.00	0.41	5.00	0.00	0.18	0.18
52.95	2.00	0.41	5.00	0.00	0.18	0.18
53.00	2.00	0.41	5.00	0.00	0.18	0.18
53.05	2.00	0.41	5.00	0.00	0.18	0.18
53.10	2.00	0.41	5.00	0.00	0.18	0.18
53.15	2.00	0.41	5.00	0.00	0.18	0.18
53.20	2.00	0.41	5.00	0.00	0.18	0.18
53.25	2.00	0.41	5.00	0.00	0.18	0.18
53.30	2.00	0.41	5.00	0.00	0.18	0.18
53.35	2.00	0.41	5.00	0.00	0.18	0.18
53.40	2.00	0.41	5.00	0.00	0.18	0.18
53.45	2.00	0.41	5.00	0.00	0.18	0.18
53.50	2.00	0.41	5.00	0.00	0.18	0.18
53.55	2.00	0.41	5.00	0.00	0.18	0.18
53.60	2.00	0.41	5.00	0.00	0.18	0.18
53.65	2.00	0.41	5.00	0.00	0.18	0.18
53.70	2.00	0.41	5.00	0.00	0.18	0.18
53.75	2.00	0.41	5.00	0.00	0.18	0.18
53.80	2.00	0.41	5.00	0.00	0.18	0.18
53.85	2.00	0.41	5.00	0.00	0.18	0.18
53.90	2.00	0.41	5.00	0.00	0.18	0.18
53.95	2.00	0.41	5.00	0.00	0.18	0.18
54.00	2.00	0.41	5.00	0.00	0.18	0.18
54.05	2.00	0.41	5.00	0.00	0.18	0.18
54.10	2.00	0.41	5.00	0.00	0.18	0.18
54.15	2.00	0.41	5.00	0.00	0.18	0.18
54.20	2.00	0.41	5.00	0.00	0.18	0.18
54.25	2.00	0.41	5.00	0.00	0.18	0.18
54.30	2.00	0.41	5.00	0.00	0.18	0.18
54.35	2.00	0.41	5.00	0.00	0.18	0.18
54.40	2.00	0.41	5.00	0.00	0.18	0.18
54.45	2.00	0.41	5.00	0.00	0.18	0.18
54.50	2.00	0.41	5.00	0.00	0.18	0.18
54.55	2.00	0.41	5.00	0.00	0.18	0.18
54.60	2.00	0.41	5.00	0.00	0.18	0.18
54.65	2.00	0.41	5.00	0.00	0.18	0.18
54.70	2.00	0.41	5.00	0.00	0.18	0.18
54.75	2.00	0.41	5.00	0.00	0.18	0.18
54.80	2.00	0.40	5.00	0.00	0.18	0.18
54.85	2.00	0.40	5.00	0.00	0.18	0.18
54.90	2.00	0.40	5.00	0.00	0.18	0.18
54.95	2.00	0.40	5.00	0.00	0.18	0.18
55.00	2.00	0.40	5.00	0.00	0.18	0.18
55.05	2.00	0.40	5.00	0.00	0.18	0.18
55.10	2.00	0.40	5.00	0.00	0.18	0.18
55.15	2.00	0.40	5.00	0.00	0.18	0.18
55.20	2.00	0.40	5.00	0.00	0.18	0.18
55.25	2.00	0.40	5.00	0.00	0.18	0.18
55.30	2.00	0.40	5.00	0.00	0.18	0.18
55.35	2.00	0.40	5.00	0.00	0.18	0.18
55.40	2.00	0.40	5.00	0.00	0.18	0.18
55.45	2.00	0.40	5.00	0.00	0.18	0.18
55.50	2.00	0.40	5.00	0.00	0.18	0.18
55.55	2.00	0.40	5.00	0.00	0.18	0.18
55.60	2.00	0.40	5.00	0.00	0.18	0.18
55.65	2.00	0.40	5.00	0.00	0.18	0.18
55.70	2.00	0.40	5.00	0.00	0.18	0.18
55.75	2.00	0.40	5.00	0.00	0.18	0.18
55.80	2.00	0.40	5.00	0.00	0.18	0.18
55.85	2.00	0.40	5.00	0.00	0.18	0.18
55.90	2.00	0.40	5.00	0.00	0.18	0.18
55.95	2.00	0.40	5.00	0.00	0.18	0.18
56.00	2.00	0.40	5.00	0.00	0.18	0.18
56.05	2.00	0.40	5.00	0.00	0.18	0.18
56.10	2.00	0.40	5.00	0.00	0.18	0.18
56.15	2.00	0.40	5.00	0.00	0.18	0.18
56.20	2.00	0.40	5.00	0.00	0.18	0.18
56.25	2.00	0.40	5.00	0.00	0.18	0.18
56.30	2.00	0.40	5.00	0.00	0.18	0.18
56.35	2.00	0.40	5.00	0.00	0.18	0.18
56.40	2.00	0.40	5.00	0.00	0.18	0.18
56.45	2.00	0.40	5.00	0.00	0.18	0.18
56.50	2.00	0.40	5.00	0.00	0.18	0.18
56.55	2.00	0.40	5.00	0.00	0.18	0.18
56.60	2.00	0.40	5.00	0.00	0.18	0.18
56.65	2.00	0.40	5.00	0.00	0.18	0.18

56.70	2.00	0.40	5.00	0.00	0.18	0.18
56.75	2.00	0.40	5.00	0.00	0.18	0.18
56.80	2.00	0.40	5.00	0.00	0.18	0.18
56.85	2.00	0.40	5.00	0.00	0.18	0.18
56.90	2.00	0.40	5.00	0.00	0.18	0.18
56.95	2.00	0.40	5.00	0.00	0.18	0.18
57.00	2.00	0.40	5.00	0.00	0.18	0.18
57.05	0.57	0.39	5.00	0.00	0.18	0.18
57.10	0.57	0.39	5.00	0.00	0.18	0.18
57.15	0.57	0.39	5.00	0.00	0.18	0.18
57.20	0.57	0.39	5.00	0.00	0.18	0.18
57.25	0.57	0.39	5.00	0.00	0.18	0.18
57.30	0.57	0.39	5.00	0.00	0.18	0.18
57.35	0.57	0.39	5.00	0.00	0.18	0.18
57.40	0.57	0.39	5.00	0.00	0.18	0.18
57.45	0.57	0.39	5.00	0.00	0.18	0.18
57.50	0.57	0.39	5.00	0.00	0.18	0.18
57.55	0.57	0.39	5.00	0.00	0.18	0.18
57.60	0.57	0.39	5.00	0.00	0.18	0.18
57.65	0.57	0.39	5.00	0.00	0.18	0.18
57.70	0.57	0.39	5.00	0.00	0.18	0.18
57.75	0.57	0.39	5.00	0.00	0.17	0.17
57.80	0.57	0.39	5.00	0.00	0.17	0.17
57.85	0.57	0.39	5.00	0.00	0.17	0.17
57.90	0.57	0.39	5.00	0.00	0.17	0.17
57.95	0.57	0.39	5.00	0.00	0.17	0.17
58.00	0.57	0.39	5.00	0.00	0.17	0.17
58.05	0.57	0.39	5.00	0.00	0.17	0.17
58.10	0.57	0.39	5.00	0.00	0.17	0.17
58.15	0.57	0.39	5.00	0.00	0.17	0.17
58.20	0.57	0.39	5.00	0.00	0.17	0.17
58.25	0.57	0.39	5.00	0.00	0.17	0.17
58.30	0.57	0.39	5.00	0.00	0.17	0.17
58.35	0.57	0.39	5.00	0.00	0.17	0.17
58.40	0.57	0.39	5.00	0.00	0.17	0.17
58.45	0.57	0.39	5.00	0.00	0.17	0.17
58.50	0.57	0.39	5.00	0.00	0.16	0.16
58.55	0.57	0.39	5.00	0.00	0.16	0.16
58.60	0.57	0.39	5.00	0.00	0.16	0.16
58.65	0.57	0.39	5.00	0.00	0.16	0.16
58.70	0.57	0.39	5.00	0.00	0.16	0.16
58.75	0.57	0.39	5.00	0.00	0.16	0.16
58.80	0.57	0.39	5.00	0.00	0.16	0.16
58.85	0.57	0.39	5.00	0.00	0.16	0.16
58.90	0.57	0.39	5.00	0.00	0.16	0.16
58.95	0.57	0.39	5.00	0.00	0.16	0.16
59.00	0.57	0.39	5.00	0.00	0.16	0.16
59.05	0.57	0.39	5.00	0.00	0.16	0.16
59.10	0.57	0.39	5.00	0.00	0.16	0.16
59.15	0.57	0.39	5.00	0.00	0.16	0.16
59.20	0.57	0.39	5.00	0.00	0.15	0.15
59.25	0.57	0.38	5.00	0.00	0.15	0.15
59.30	0.57	0.38	5.00	0.00	0.15	0.15
59.35	0.57	0.38	5.00	0.00	0.15	0.15
59.40	0.57	0.38	5.00	0.00	0.15	0.15
59.45	0.57	0.38	5.00	0.00	0.15	0.15
59.50	0.57	0.38	5.00	0.00	0.15	0.15
59.55	0.57	0.38	5.00	0.00	0.15	0.15
59.60	0.57	0.38	5.00	0.00	0.15	0.15
59.65	0.57	0.38	5.00	0.00	0.15	0.15
59.70	0.57	0.38	5.00	0.00	0.15	0.15
59.75	0.57	0.38	5.00	0.00	0.15	0.15
59.80	0.57	0.38	5.00	0.00	0.15	0.15
59.85	0.57	0.38	5.00	0.00	0.14	0.14
59.90	0.57	0.38	5.00	0.00	0.14	0.14
59.95	0.57	0.38	5.00	0.00	0.14	0.14
60.00	0.56	0.38	5.00	0.00	0.14	0.14
60.05	0.56	0.38	5.00	0.00	0.14	0.14
60.10	0.56	0.38	5.00	0.00	0.14	0.14
60.15	0.56	0.38	5.00	0.00	0.14	0.14
60.20	0.56	0.38	5.00	0.00	0.14	0.14
60.25	0.56	0.38	5.00	0.00	0.14	0.14
60.30	0.56	0.38	5.00	0.00	0.14	0.14
60.35	0.56	0.38	5.00	0.00	0.14	0.14
60.40	0.56	0.38	5.00	0.00	0.13	0.13
60.45	0.56	0.38	5.00	0.00	0.13	0.13
60.50	0.56	0.38	5.00	0.00	0.13	0.13
60.55	0.56	0.38	5.00	0.00	0.13	0.13
60.60	0.56	0.38	5.00	0.00	0.13	0.13

60.65	0.56	0.38	5.00	0.00	0.13	0.13
60.70	0.56	0.38	5.00	0.00	0.13	0.13
60.75	0.56	0.38	5.00	0.00	0.13	0.13
60.80	0.56	0.38	5.00	0.00	0.13	0.13
60.85	0.56	0.38	5.00	0.00	0.13	0.13
60.90	0.56	0.38	5.00	0.00	0.13	0.13
60.95	0.56	0.38	5.00	0.00	0.13	0.13
61.00	0.56	0.38	5.00	0.00	0.12	0.12
61.05	0.56	0.38	5.00	0.00	0.12	0.12
61.10	0.56	0.38	5.00	0.00	0.12	0.12
61.15	0.56	0.38	5.00	0.00	0.12	0.12
61.20	0.56	0.38	5.00	0.00	0.12	0.12
61.25	0.56	0.38	5.00	0.00	0.12	0.12
61.30	0.56	0.38	5.00	0.00	0.12	0.12
61.35	0.56	0.38	5.00	0.00	0.12	0.12
61.40	0.56	0.38	5.00	0.00	0.12	0.12
61.45	0.56	0.37	5.00	0.00	0.12	0.12
61.50	0.56	0.37	5.00	0.00	0.12	0.12
61.55	0.56	0.37	5.00	0.00	0.12	0.12
61.60	0.56	0.37	5.00	0.00	0.11	0.11
61.65	0.56	0.37	5.00	0.00	0.11	0.11
61.70	0.56	0.37	5.00	0.00	0.11	0.11
61.75	0.56	0.37	5.00	0.00	0.11	0.11
61.80	0.56	0.37	5.00	0.00	0.11	0.11
61.85	0.56	0.37	5.00	0.00	0.11	0.11
61.90	0.56	0.37	5.00	0.00	0.11	0.11
61.95	0.56	0.37	5.00	0.00	0.11	0.11
62.00	0.56	0.37	5.00	0.00	0.11	0.11
62.05	0.56	0.37	5.00	0.00	0.11	0.11
62.10	0.56	0.37	5.00	0.00	0.11	0.11
62.15	0.56	0.37	5.00	0.00	0.11	0.11
62.20	0.56	0.37	5.00	0.00	0.11	0.11
62.25	0.56	0.37	5.00	0.00	0.10	0.10
62.30	0.56	0.37	5.00	0.00	0.10	0.10
62.35	0.56	0.37	5.00	0.00	0.10	0.10
62.40	0.56	0.37	5.00	0.00	0.10	0.10
62.45	0.56	0.37	5.00	0.00	0.10	0.10
62.50	0.56	0.37	5.00	0.00	0.10	0.10
62.55	0.56	0.37	5.00	0.00	0.10	0.10
62.60	0.56	0.37	5.00	0.00	0.10	0.10
62.65	0.56	0.37	5.00	0.00	0.10	0.10
62.70	0.56	0.37	5.00	0.00	0.10	0.10
62.75	0.56	0.37	5.00	0.00	0.10	0.10
62.80	0.56	0.37	5.00	0.00	0.10	0.10
62.85	0.56	0.37	5.00	0.00	0.10	0.10
62.90	0.56	0.37	5.00	0.00	0.10	0.10
62.95	0.56	0.37	5.00	0.00	0.09	0.09
63.00	0.56	0.37	5.00	0.00	0.09	0.09
63.05	0.56	0.37	5.00	0.00	0.09	0.09
63.10	0.56	0.37	5.00	0.00	0.09	0.09
63.15	0.56	0.37	5.00	0.00	0.09	0.09
63.20	0.56	0.37	5.00	0.00	0.09	0.09
63.25	0.56	0.37	5.00	0.00	0.09	0.09
63.30	0.56	0.37	5.00	0.00	0.09	0.09
63.35	0.56	0.37	5.00	0.00	0.09	0.09
63.40	0.56	0.37	5.00	0.00	0.09	0.09
63.45	0.56	0.37	5.00	0.00	0.09	0.09
63.50	0.56	0.37	5.00	0.00	0.09	0.09
63.55	0.56	0.37	5.00	0.00	0.09	0.09
63.60	0.56	0.37	5.00	0.00	0.09	0.09
63.65	0.56	0.36	5.00	0.00	0.08	0.08
63.70	0.56	0.36	5.00	0.00	0.08	0.08
63.75	0.56	0.36	5.00	0.00	0.08	0.08
63.80	0.56	0.36	5.00	0.00	0.08	0.08
63.85	0.56	0.36	5.00	0.00	0.08	0.08
63.90	0.56	0.36	5.00	0.00	0.08	0.08
63.95	0.56	0.36	5.00	0.00	0.08	0.08
64.00	0.55	0.36	5.00	0.00	0.08	0.08
64.05	0.55	0.36	5.00	0.00	0.08	0.08
64.10	0.55	0.36	5.00	0.00	0.08	0.08
64.15	0.55	0.36	5.00	0.00	0.08	0.08
64.20	0.55	0.36	5.00	0.00	0.08	0.08
64.25	0.55	0.36	5.00	0.00	0.08	0.08
64.30	0.55	0.36	5.00	0.00	0.08	0.08
64.35	0.55	0.36	5.00	0.00	0.08	0.08
64.40	0.55	0.36	5.00	0.00	0.08	0.08
64.45	0.55	0.36	5.00	0.00	0.07	0.07
64.50	0.55	0.36	5.00	0.00	0.07	0.07
64.55	0.55	0.36	5.00	0.00	0.07	0.07

64.60	0.55	0.36	5.00	0.00	0.07	0.07
64.65	0.55	0.36	5.00	0.00	0.07	0.07
64.70	0.55	0.36	5.00	0.00	0.07	0.07
64.75	0.55	0.36	5.00	0.00	0.07	0.07
64.80	0.55	0.36	5.00	0.00	0.07	0.07
64.85	0.55	0.36	5.00	0.00	0.07	0.07
64.90	0.55	0.36	5.00	0.00	0.07	0.07
64.95	0.55	0.36	5.00	0.00	0.07	0.07
65.00	0.55	0.36	5.00	0.00	0.07	0.07
65.05	0.55	0.36	5.00	0.00	0.07	0.07
65.10	0.55	0.36	5.00	0.00	0.07	0.07
65.15	0.55	0.36	5.00	0.00	0.07	0.07
65.20	0.55	0.36	5.00	0.00	0.07	0.07
65.25	0.55	0.36	5.00	0.00	0.07	0.07
65.30	0.55	0.36	5.00	0.00	0.06	0.06
65.35	0.55	0.36	5.00	0.00	0.06	0.06
65.40	0.55	0.36	5.00	0.00	0.06	0.06
65.45	0.55	0.36	5.00	0.00	0.06	0.06
65.50	0.55	0.36	5.00	0.00	0.06	0.06
65.55	0.55	0.36	5.00	0.00	0.06	0.06
65.60	0.55	0.36	5.00	0.00	0.06	0.06
65.65	0.55	0.36	5.00	0.00	0.06	0.06
65.70	0.55	0.36	5.00	0.00	0.06	0.06
65.75	0.55	0.36	5.00	0.00	0.06	0.06
65.80	0.55	0.36	5.00	0.00	0.06	0.06
65.85	0.55	0.35	5.00	0.00	0.06	0.06
65.90	0.55	0.35	5.00	0.00	0.06	0.06
65.95	0.55	0.35	5.00	0.00	0.06	0.06
66.00	0.55	0.35	5.00	0.00	0.06	0.06
66.05	0.55	0.35	5.00	0.00	0.06	0.06
66.10	0.55	0.35	5.00	0.00	0.06	0.06
66.15	0.55	0.35	5.00	0.00	0.05	0.05
66.20	0.55	0.35	5.00	0.00	0.05	0.05
66.25	0.55	0.35	5.00	0.00	0.05	0.05
66.30	0.55	0.35	5.00	0.00	0.05	0.05
66.35	0.55	0.35	5.00	0.00	0.05	0.05
66.40	0.55	0.35	5.00	0.00	0.05	0.05
66.45	0.55	0.35	5.00	0.00	0.05	0.05
66.50	0.55	0.35	5.00	0.00	0.05	0.05
66.55	0.55	0.35	5.00	0.00	0.05	0.05
66.60	0.55	0.35	5.00	0.00	0.05	0.05
66.65	0.55	0.35	5.00	0.00	0.05	0.05
66.70	0.55	0.35	5.00	0.00	0.05	0.05
66.75	0.55	0.35	5.00	0.00	0.05	0.05
66.80	0.55	0.35	5.00	0.00	0.05	0.05
66.85	0.55	0.35	5.00	0.00	0.05	0.05
66.90	0.55	0.35	5.00	0.00	0.05	0.05
66.95	0.55	0.35	5.00	0.00	0.04	0.04
67.00	0.55	0.35	5.00	0.00	0.04	0.04
67.05	0.55	0.35	5.00	0.00	0.04	0.04
67.10	0.55	0.35	5.00	0.00	0.04	0.04
67.15	0.55	0.35	5.00	0.00	0.04	0.04
67.20	0.55	0.35	5.00	0.00	0.04	0.04
67.25	0.55	0.35	5.00	0.00	0.04	0.04
67.30	0.55	0.35	5.00	0.00	0.04	0.04
67.35	0.55	0.35	5.00	0.00	0.04	0.04
67.40	0.55	0.35	5.00	0.00	0.04	0.04
67.45	0.55	0.35	5.00	0.00	0.04	0.04
67.50	0.55	0.35	5.00	0.00	0.04	0.04
67.55	0.55	0.35	5.00	0.00	0.04	0.04
67.60	0.55	0.35	5.00	0.00	0.04	0.04
67.65	0.55	0.35	5.00	0.00	0.04	0.04
67.70	0.55	0.35	5.00	0.00	0.04	0.04
67.75	0.55	0.35	5.00	0.00	0.04	0.04
67.80	0.55	0.35	5.00	0.00	0.03	0.03
67.85	0.55	0.35	5.00	0.00	0.03	0.03
67.90	0.55	0.35	5.00	0.00	0.03	0.03
67.95	0.55	0.35	5.00	0.00	0.03	0.03
68.00	0.55	0.35	5.00	0.00	0.03	0.03
68.05	0.55	0.35	5.00	0.00	0.03	0.03
68.10	0.55	0.34	5.00	0.00	0.03	0.03
68.15	0.55	0.34	5.00	0.00	0.03	0.03
68.20	0.54	0.34	5.00	0.00	0.03	0.03
68.25	0.54	0.34	5.00	0.00	0.03	0.03
68.30	0.54	0.34	5.00	0.00	0.03	0.03
68.35	0.54	0.34	5.00	0.00	0.03	0.03
68.40	0.54	0.34	5.00	0.00	0.03	0.03
68.45	0.54	0.34	5.00	0.00	0.03	0.03
68.50	0.54	0.34	5.00	0.00	0.03	0.03

68.55	0.54	0.34	5.00	0.00	0.03	0.03
68.60	0.54	0.34	5.00	0.00	0.02	0.02
68.65	0.54	0.34	5.00	0.00	0.02	0.02
68.70	0.54	0.34	5.00	0.00	0.02	0.02
68.75	0.54	0.34	5.00	0.00	0.02	0.02
68.80	0.54	0.34	5.00	0.00	0.02	0.02
68.85	0.54	0.34	5.00	0.00	0.02	0.02
68.90	0.54	0.34	5.00	0.00	0.02	0.02
68.95	0.54	0.34	5.00	0.00	0.02	0.02
69.00	0.54	0.34	5.00	0.00	0.02	0.02
69.05	0.54	0.34	5.00	0.00	0.02	0.02
69.10	0.54	0.34	5.00	0.00	0.02	0.02
69.15	0.54	0.34	5.00	0.00	0.02	0.02
69.20	0.54	0.34	5.00	0.00	0.02	0.02
69.25	0.54	0.34	5.00	0.00	0.02	0.02
69.30	0.54	0.34	5.00	0.00	0.02	0.02
69.35	0.54	0.34	5.00	0.00	0.01	0.01
69.40	0.54	0.34	5.00	0.00	0.01	0.01
69.45	0.54	0.34	5.00	0.00	0.01	0.01
69.50	0.54	0.34	5.00	0.00	0.01	0.01
69.55	0.54	0.34	5.00	0.00	0.01	0.01
69.60	0.54	0.34	5.00	0.00	0.01	0.01
69.65	0.54	0.34	5.00	0.00	0.01	0.01
69.70	0.54	0.34	5.00	0.00	0.01	0.01
69.75	0.54	0.34	5.00	0.00	0.01	0.01
69.80	0.54	0.34	5.00	0.00	0.01	0.01
69.85	0.54	0.34	5.00	0.00	0.01	0.01
69.90	0.54	0.34	5.00	0.00	0.01	0.01
69.95	0.54	0.34	5.00	0.00	0.01	0.01
70.00	0.54	0.34	5.00	0.00	0.01	0.01
70.05	0.54	0.34	5.00	0.00	0.01	0.01
70.10	0.54	0.34	5.00	0.00	0.01	0.01
70.15	0.54	0.34	5.00	0.00	0.00	0.00
70.20	0.54	0.34	5.00	0.00	0.00	0.00
70.25	0.54	0.34	5.00	0.00	0.00	0.00
70.30	0.54	0.33	5.00	0.00	0.00	0.00
70.35	0.54	0.33	5.00	0.00	0.00	0.00
70.40	0.54	0.33	5.00	0.00	0.00	0.00
70.45	0.54	0.33	5.00	0.00	0.00	0.00
70.50	0.54	0.33	5.00	0.00	0.00	0.00

* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

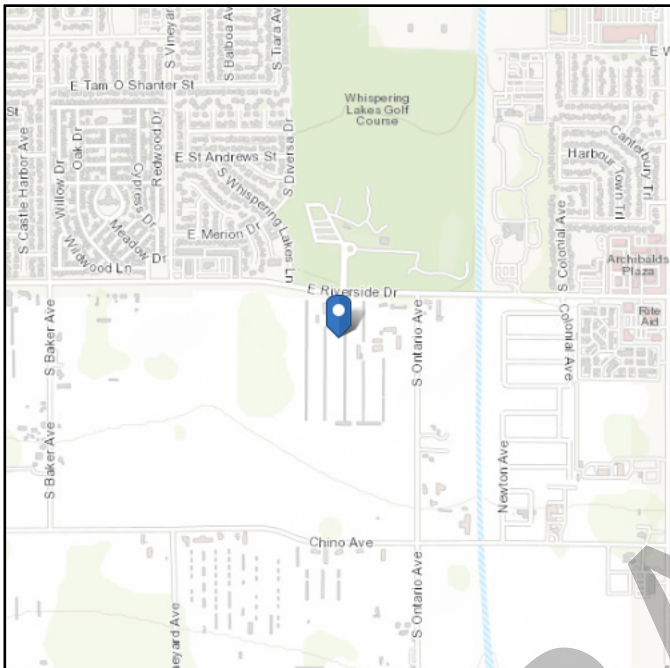
1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

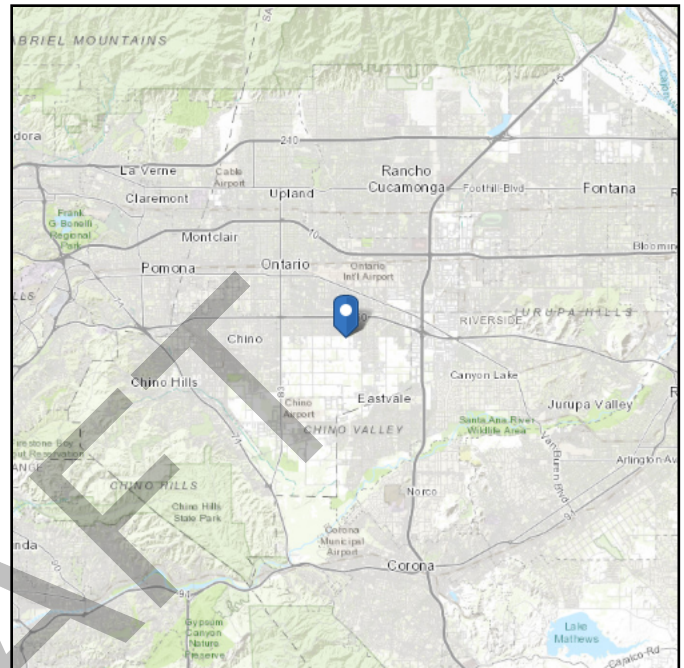
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: I
Soil Class: D - Stiff Soil

Latitude: 34.01789
Longitude: -117.604962
Elevation: 768.6973176987071 ft (NAVD 88)





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.607	S_{D1} :	N/A
S_1 :	0.581	T_L :	8
F_a :	1	PGA :	0.669
F_v :	N/A	PGA_M :	0.736
S_{MS} :	1.607	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.071	C_v :	1.421

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue Oct 17 2023

Date Source: USGS Seismic Design Maps

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Latitude

Decimal degrees

34.01789

Longitude

Decimal degrees, negative values for western longitudes

-117.604962

Site Class

259 m/s (Site class D)

Spectral Period

Peak Ground Acceleration

Time Horizon

Return period in years

2475

Hazard Curve

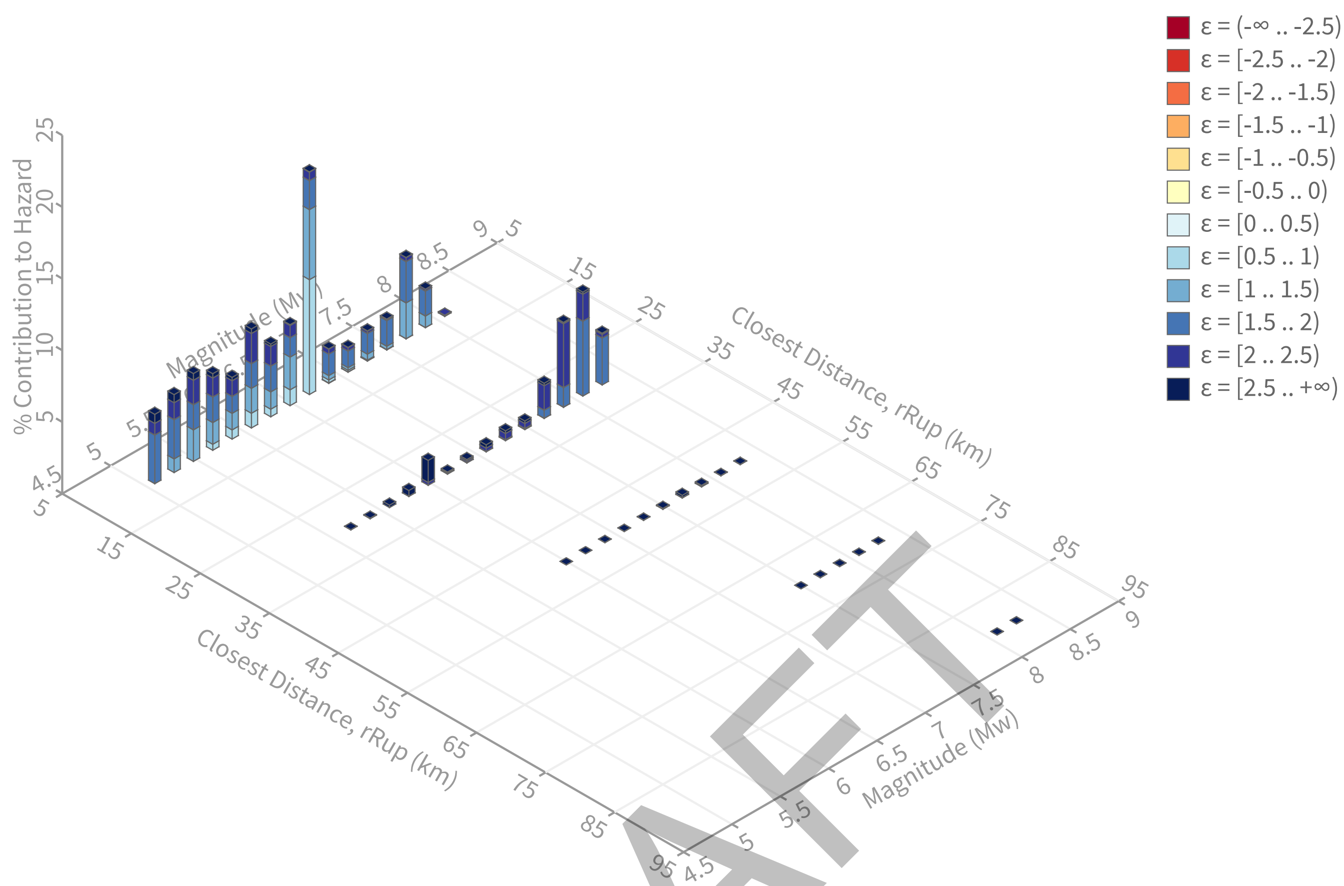
Please select “Edition”, “Location” & “Site Class” above to compute a hazard curve.

Compute Hazard Curve

Deaggregation

Component

Total



% Contribution to Hazard
Magnitude (Mw)
Closest Distance, rRup (km)
Closest Distance, rRup (km)
Magnitude (Mw)
ε = (-∞ .. -2.5)
ε = [-2.5 .. -2)
ε = [-2 .. -1.5)
ε = [-1.5 .. -1)
ε = [-1 .. -0.5)
ε = [-0.5 .. 0)
ε = [0 .. 0.5)
ε = [0.5 .. 1)
ε = [1 .. 1.5)
ε = [1.5 .. 2)
ε = [2 .. 2.5)
ε = [2.5 .. +∞)

Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.75789666 g

Recovered targets

Return period: 3042.2855 yrs
Exceedance rate: 0.00032870025 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.06 %

Mean (over all sources)

m: 6.7
r: 13.84 km
ε_0: 1.7 σ

Mode (largest m-r bin)

m: 6.65
r: 5.33 km
ε_0: 1.1 σ
Contribution: 15.52 %

Mode (largest m-r-ε_0 bin)

m: 6.64
r: 3.79 km
ε_0: 0.8 σ
Contribution: 8.01 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							31.62
Fontana (Seismicity) [2]		3.84	6.61	0.93	117.580°W	33.995°N	137.58	7.68
San Andreas (San Bernardino N) [2]		31.05	7.97	2.10	117.404°W	34.242°N	36.53	4.27
San Jacinto (San Bernardino) [2]		26.98	8.09	1.91	117.353°W	34.141°N	59.26	3.50
Whittier alt 1 [1]		17.41	7.49	1.70	117.663°W	33.863°N	197.20	3.07
Chino alt 1 [1]		11.79	6.48	2.01	117.703°W	33.950°N	230.32	2.83
Cucamonga [3]		16.79	7.73	1.65	117.671°W	34.158°N	338.85	1.82
Elsinore (Glen Ivy) rev [0]		21.10	6.63	2.51	117.590°W	33.829°N	176.24	1.18
Chino alt 1 [2]		11.79	6.69	1.91	117.703°W	33.950°N	230.32	1.13
San Jacinto (Lytle Creek connector) [1]		23.54	8.06	1.81	117.438°W	34.178°N	40.76	1.01
UC33brAvg_FM32	System							28.88
Fontana (Seismicity) [2]		3.84	6.61	0.93	117.580°W	33.995°N	137.58	6.29
San Andreas (San Bernardino N) [2]		31.05	7.97	2.10	117.404°W	34.242°N	36.53	4.36
San Jacinto (San Bernardino) [2]		26.98	8.08	1.91	117.353°W	34.141°N	59.26	3.44
Whittier alt 2 [1]		17.89	7.57	1.70	117.671°W	33.864°N	199.71	2.83
Chino alt 2 [1]		11.47	6.84	1.81	117.700°W	33.952°N	230.28	2.77
Cucamonga [3]		16.79	7.75	1.64	117.671°W	34.158°N	338.85	1.86
Elsinore (Glen Ivy) rev [0]		21.10	6.61	2.52	117.590°W	33.829°N	176.24	1.19
UC33brAvg_FM31 (opt)	Grid							19.97
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.44
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.44
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
UC33brAvg_FM32 (opt)	Grid							19.53
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.34
PointSourceFinite: -117.605, 34.040		5.64	5.66	1.38	117.605°W	34.040°N	0.00	5.34
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07
PointSourceFinite: -117.605, 34.103		9.89	5.87	1.93	117.605°W	34.103°N	0.00	2.07

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APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

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Appendix G3 Paleontological Resources Memorandum

Appendices

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December 6, 2023

Nicole Vermilion
PlaceWorks, Inc.
Submitted via email: nvermilion@placeworks.com

RE: Paleontological Assessment Memorandum for the Ontario Sports Complex Project, San Bernardino County, California

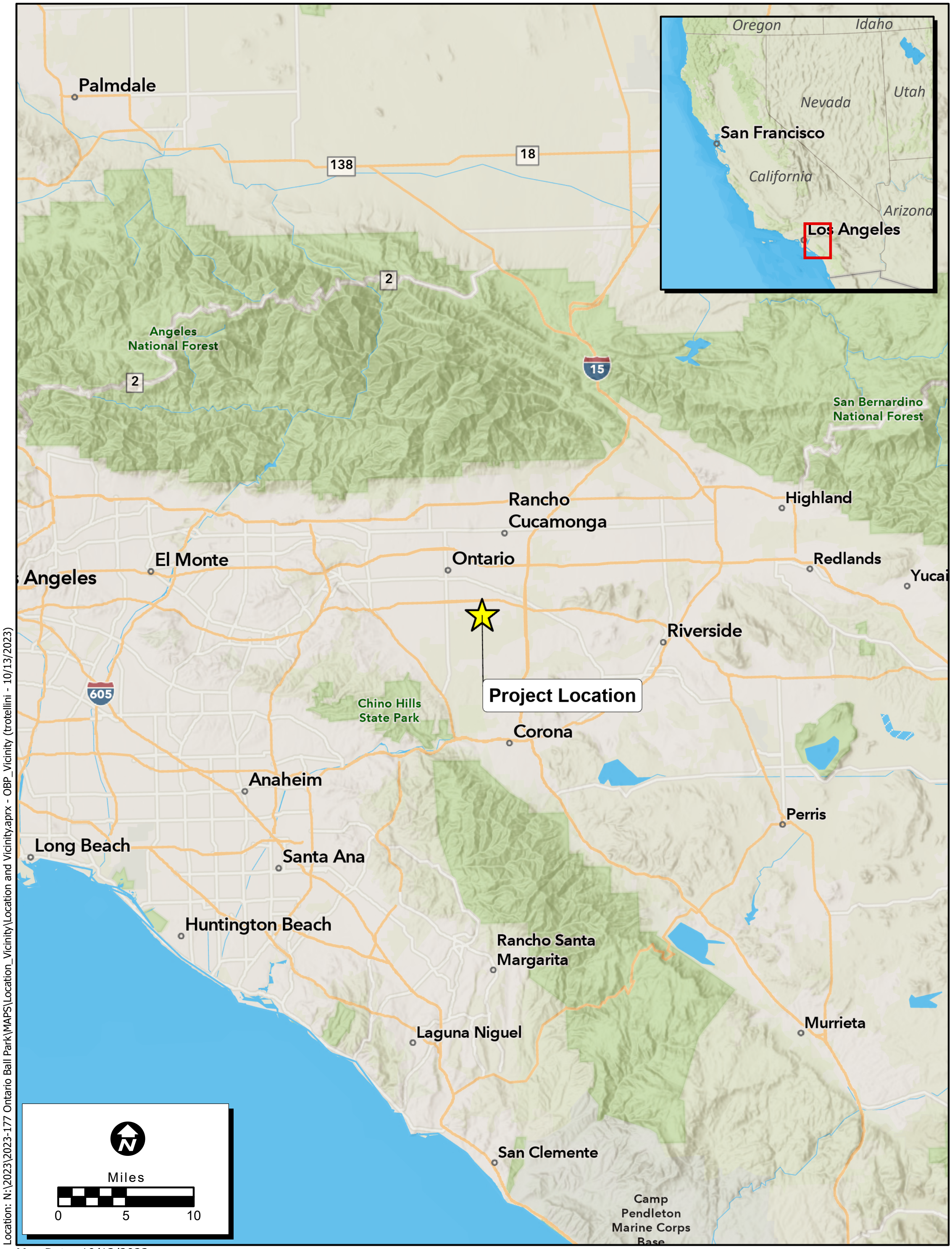
Dear Ms. Vermilion:

ECORP Consulting, Inc. completed a thorough investigation into the potential to directly impact paleontological resources during the construction of the Ontario Sports Complex Project (Project). This investigation included a paleontological record search through the Western Science Center (WSC) in Hemet, California and a desktop study of the geology and paleontology of the Project Area. The Project Area consists of approximately 191 acres with offsite improvements for water and sewer lines (assumed to be up to 2 miles in length and up to 50 feet on either side of the existing paved roadways), improvements to the existing Chino Avenue (assumed to be up to 1 mile in length with a corridor width of 150 feet). It is located west of the Cucamonga Creek Flood Control Channel, east of Vineyard Avenue, south of Riverside Drive, and north of Chino Avenue. The Project Area occurs within Township 1 South, Range 7 West, Sections 33 and 34, as well as Township 2 South, Range 7 West, Sections 2, 3, 10, 11, 14, 15, 22, and 23 on the San Bernardino, California U.S. Geological Survey 7.5-minute topographic quadrangle map (Figure 1).

GEOLOGIC SETTING

Regionally, the Project Area is part of the Peninsular Ranges Geomorphic Province that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin southward to the southern tip of Baja California. The province is characterized by steep, mountainous terrain and valleys trending in a northwestern direction. Plutonic and metamorphic rocks, making up the bedrock, compose the majority of the surrounding mountains. Plio/Pleistocene-aged to older Quaternary-aged alluvial fan deposits fill the valleys and younger alluvium fill the incised drainages (L.D. King, Inc. 2014).

Located in the western section of the San Bernardino Valley, south of the San Gabriel Mountains, the City of Ontario, along with the Project Area, is underlain by alluvial soils resulting from the erosion of the San Gabriel Mountains to the north (Figure 2). Desktop studies of the geology for the Project Area indicate that the underlying geologic units are primarily alluvial deposits from the Holocene epoch (Morton and Miller 2006). These deposits consist of fine-grained, silty sands and fine- to medium-grained sand and vary in color form brown, gray, or yellowish-brown (Morton and Miller 2003).



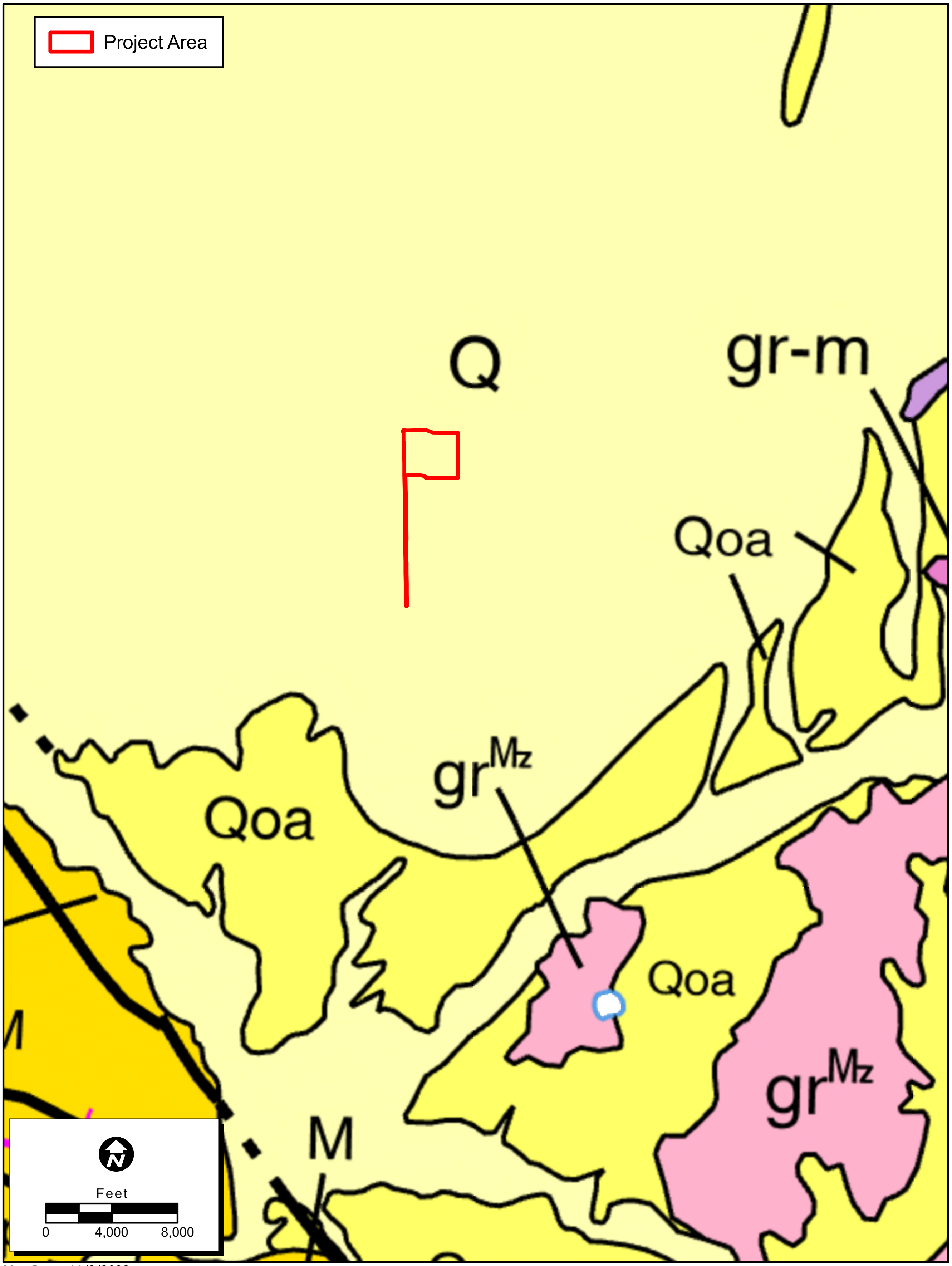
Map Date: 10/13/2023

Sources: ESRI

Figure 1. Location and Vicinity Map

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2023-177 Ontario Ball Park



Location: N:\2023\2023-177 Ontario Ball Park\MAPS\Soils_and_Geology\Ontario_Soils_Geology.aprx - OBP_Geology (mguidry - 11/3/2023)

Map Date: 11/3/2023
Sources: ESRI

Figure 2. Geology

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2023-177 Ontario Ball Park

RECORD SEARCH RESULTS

ECORP conducted a paleontological record search through the Western Science Center in Hemet, California. The WSC does not have fossil localities in the Project Area or within a 1-mile radius of the Project Area (Stoneburg 2023). Because the geologic units mapped in the area are alluvial deposits from the Holocene, they are unlikely to contain fossils due to the modern associated dates. However, if ground disturbance exceeds the alluvial deposits, the likelihood of reaching Pleistocene (approximately 2 million years ago to 11,700 years ago) alluvial sediments would increase, and the there is potential within these sediments to contain fossils. In addition, a record search conducted by the San Bernardino County Museum found the remains of a mammoth from approximately 20 feet below the ground surface within the City area (PlaceWorks 2022). This further supports that there is potential for fossils to be found with depth.

RECOMMENDATIONS

To assess the significance of a geologic unit to contain paleontological resources (i.e., paleontological potential/sensitivity), paleontologists have adopted the standards set forth by the Society of Vertebrate Paleontology (2010). Holocene alluvium on the surface within the Project Area has been assigned a low sensitivity criteria for producing fossils. However, due to the presence of Pleistocene alluvial deposits beneath and the discovery of mammoth remains within City limits, it is recommended that a Paleontological Resources Mitigation and Monitoring Plan (PRMMP) be set forth prior to the start of construction. The PRMMP will discuss the laws and regulations that have been set for the protection of paleontological resources, the significance of the fossils, and protocol to follow in case a discovery is made. The PRMMP will also outline the duties of the paleontological monitor onsite, including the salvaging and preparation of fossils and the final submission of all paleontological resources to an accredited museum or facility for curation. Below are Mitigation Measures to be carried out before and during Project construction.

GEO-1: Prior to grading, a Paleontological Resources Mitigation and Monitoring Plan (PRMMP) shall be prepared by a Qualified Paleontologist meeting the standards of Society of Vertebrate Paleontology (2010). The PRMMP shall discuss the laws and regulations for the protection of paleontological resources, the significance of fossils, and protocol to follow in case a discovery is made. The PRMMP shall also outline the duties of paleontological monitoring onsite, including the salvaging and preparation of fossils and the final submission of all paleontological resources to an accredited museum or facility for curation.

GEO-2: During excavations exceeding depth of approximately 5-10 feet below ground surface, a qualified paleontological monitor shall be present during construction activities to spot check the sediments and depths of excavations to determine the geologic units encountered. If paleontological resources are discovered, full-time monitoring shall be required during grading, as identified in the Paleontological Resources Monitoring and Mitigation Plan.

GEO-3: In the event of any fossil discovery, regardless of depth or geologic formation, construction work shall halt within a 50-foot radius of the find until its significance can be determined by a qualified paleontologist. Significant fossils shall be recovered, prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological curation facility in accordance with the standards of the Society of Vertebrate Paleontology (2010). A regional repository shall be identified by the City Council and a curatorial arrangement shall be signed prior to collection of the fossils.

If you have any questions, please feel free to contact me via email or directly at (916) 708-5330.

Sincerely,

Niranjala Kottachchi
Paleontological Resources Manager

REFERENCES

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PERSONAL COMMUNICATION

Email from Brittney Stoneburg. November 1, 2023. Paleontological Record Search Western Science Center, Hemet, California.