Appendix A

Pest Management Plan

GGCo.	Pest Management and Control	DOC # SL GMP 02.01	DATE: 5.14.22
	Standard Operating Procedures		
Revision Date:		Created By:	R. Ahmann
Revision NO:		Approved By:	C. Walker

1. SCOPE:

This document describes the steps required to prevent access of, deny harborage and eradicate any infestation within the facility.

Related Regulations: Code of Federal Regulations, Title 21, Part 110 GMP Practices
Related Westside Warehouse SOP's: GMP

Responsibility	Frequency	Monitoring Activity	Records
Shift Manager Pest Control Company	Daily Observation	Monthly GMP Audit	Internal Trap Record External Report

2. CORRECTIVE ACTIONS:

When findings deviate from written standards, the QA designate will document findings on the Daily/ Monthly GMP Audit Form and notify the General Manager of the deviation.

Short-term action will be initiated and recorded on the Daily/Monthly GMP audit form. Long-term action required will be discussed by management, and corrective actions / responsibilities and corrective actions / responsibilities and timeframes will be agreed upon and documented.

3. RECORDS:

Garcia Grow Co. will maintain complete monthly records to include: Internal Trap Records (UNKNOWN VENDOR) will supply Garcia Grow Co. with complete monthly records of monitored pest activity.

4. EMPLOYEE TRAINING:

4.1 Employees will be trained on proper procedures for checking internal traps. Training will include, but not limited to:

a) Trap locations
b) What is a clean /dirty trap?
c) How is "type" defined
d) PPE Requirements

e) Internal Trap Records / Location of Record book

5. PROCEDURE: Internal Traps

5.1 NO POISONOUS BAITS ARE ALLOWED WITHIN THE FACILITY
5.2 Shift managers will visually inspect the facility daily for signs of pest/ rodent activity. Any noticeable activity will be reported to the Plant Manager / QA Manager.
5.3 Interior traps will have an unambiguous number on the outside of the trap.
5.4 Trap locations will be marked on a floor map as well as blue arrow located on the wall .
5.4 Traps will be checked monthly. A schedule will be posted.
5.6 Employees will be trained on proper procedures for checking internal traps, by shift managers. The Training Check list will be added to employee file.
5.7 The exterior of the trap will be wiped of monthly.
5.8 Traps are emptied into a small garbage bag and disposed directly into the outside garbage.

5. Flying Insect Control:

5.1 Insects are controlled by electric insect eradicators.
5.2 Electric insect eradicators are not to be higher than six feet from the ground.
5.3 Catch trays should be emptied weekly while catch trays with sticky pads will be monitored and replaced when appropriate.

6. Exterior rodent bait stations are the responsibility of (unknown vendor at this time)
Monthly reporting is required.

7. QA Monitoring:

7.1 The QA Manager will change the pest control program if the current program proves ineffective.
7.2 QA Manager and/or outside Pest Control Technician will record any description of nonconformity, the core of the problem, and the corrective action requires with the date of the action on the Pest Control Monitoring Record.
7.3 Plant Manager will alert shift managers of any changes and updated employee training.

Internal Trap Locations *** We will create the map once the facility is completed.

Employee Training Check List *** Create a training check list once the facility is completed

Appendix B

Odor Control Plan

Garcia Grow Co.
Odor Control Plan

I. Contents

II. Objective

The purpose of the Odor Control Plan is to document the policies, procedures, engineering and physical controls, and other measures that will be implemented by

Garcia Grow Co. at their licensed cannabis cultivation facility to ensure a safe and secure environment for employees, customers, and the community as well as to comply with local San Joaquin County and California state security requirements.

III. Roles and Responsibilities

As relates to the hiring of personnel to staff positions listed in this plan, the CEO or a designee will ensure that the qualifications are met for each employee that requires experience or training above a normal level, including checking prior employment, degrees or training received, and other references.

A. Operations Manger

The Operations Manager (OM) will be a member of the senior staff, responsible for maintaining a successful operating environment, maximizing efficiency, safety and quality in the manufacturing process and resulting products. The OM will have direct oversight of all functions team leads and operational staff. The OM is involved in the highest level of decision making related to changes to policies and processes, as well as the introduction of new systems, equipment, and materials in support of all operational activities.

B. Chief Compliance Officer

The Chief Compliance Officer (CCO) will be responsible for implementing this Plan through the designation and management of the Cultivation Technicians or Master Grower. The CCO will compile a list of reports to be run from the Master Grower on a daily, weekly, monthly, quarterly, or annual basis.

C. Master Grower

The Master Grower is responsible for determining which odor abatement Garcia Grow Co. plans to use, based on input with the COO.

D. Cultivation Technicians and Support Staff

All levels of employees are responsible for complying with the policies and procedures documented in the Odor Control Plan. Additionally, employees will be asked to review procedures related to their specific tasks at least once per year and give recommendations for improvements.

IV. Policies

- Medicinal and Adult-Use Cannabis Regulation and Safety Act (MAUCRSA), found in business & Professions Code, Section 26000 et seq.
- **Title 16, California Code of Regulations, Chapter 1. All bureau Licensees, Article 5. Licensing, Section 4563 Odor Control & Abatement**
  - (a) A licensee shall not store cannabis goods outdoors.
  - (b) Employee break rooms, changing facilities, and bathroom's shall be separated from all storage areas.
  - (c) Each location where cannabis goods are stored must be separately licensed.
  - (d) A licensee will utilize odor abatement strategies when necessary

V. Carbon Filter Abatement

Odor Control is broken down into 3 separate parts for this project; Nursery/ vegetative state, Flowering Greenhouse, and Material Storage. Carbon filter abatement will be utilized in the nursery/veg room, and the material storage containers. Carbon filters are long, tubular, inline canisters that filter the air using carbon to "scrub" the air.

1. Garcia Grow Co. will provide sufficient funding to purchase the number and quality of materials necessary to support the Odor Control Plan at a high level of efficiency. The company will also ensure that staff have adequate and necessary equipment to meet all requirements within specified time frames.

2. At a minimum, at least one person, the Master Grower, will be fully trained in how the odor control system. The MG will ensure that enough personnel are trained in knowledge to solve problems that staff may encounter while carrying out normal business duties.

3. The MG will ensure that all employees are fully trained in the day-to-day use of the odor control system.

VI. Natural Space

Garcia Grow Co. facility is located over 500ft away from any other structure. Utilization of carbon filter's in the main greenhouse is not efficient and will not be utilized.

A. Environmental Control

In order to maintain the integrity of cannabis products, minimizing degradation and contamination potential, the physical environments were cannabis and cannabis products are processed and stored are carefully controlled. All areas are protected from UV Light, while the temperature and humidity of the storage and processing rooms (drying and trimming) are controlled through a central HVAC System. These variables can be further adjusted as needed through the use of supplemental regional AC and humidifiers to maintain ideal cannabis storage conditions.

B. Disposal/Destruction

The disposal or destruction of a carbon filter will be carried out according to the Waste Management Plan. Upon the disposal or destruction of any tagged item, the associated UID will be retired from the system in compliance with regulations.

IX. Related Documents

Version #	Summary of Changes	Author	Aproval Date
1.0	Original Document	Cody Walker	4/20/2021

Appendix C

Biological Resources Assessment

Garcia Grow Cannabis Facility Project

Biological Resources Assessment

December 2022 | 08357.00002.001

Prepared for:

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ACRONYMS AND ABBREVIATIONS

BRA	Biological Resources Assessment
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CSA	California Special Animals
CWA	Clean Water Act
DBH	diameter at breast height
EPA	U.S. Environmental Protection Agency
FESA	Federal Endangered Species Act
HCP	Habitat Conservation Plan
HELIX	HELIX Environmental Planning, Inc.
IPaC	Information for Planning and Consultation
MBTA	Migratory Bird Treaty Act
MSL	mean sea level
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NPPA	Native Plant Protection Act
NRCS	Natural Resource Conservation Service
OHWM	ordinary high water mark
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SJMSCP	San Joaquin Multi-Species Habitat Conservation and Open Space Plan
SSC	Species of Special Concern
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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EXECUTIVE SUMMARY

HELIX Environmental Planning, Inc. (HELIX) conducted a Biological Resources Assessment (BRA) on August 8, 2022, for the Garcia Grow Cannabis Facility Project (Study Area) located in unincorporated San Joaquin County, California. The site is situated in the Campo De Los Franceses Land Grant, Mount Diablo Meridian, and is depicted on the U.S. Geological Survey (USGS) *Stockton East, CA* 7.5-minute quadrangle map. The approximate center of the Study Area is at latitude, 37.9725633 and longitude -121.19003689, NAD 83, and is located at an elevation between 40 feet and 50 feet above mean sea level (MSL).

The ±52.2-acre Study Area is located in an agricultural area, approximately 1.3 miles east of Stockton, immediately west of Alpine Road. The Study Area is comprised of several SJMSCP vegetation types, including orchards and vineyards (approximately 45.57 acres), ruderal (approximately 4.12 acres), seasonal wetland (approximately 0.05 acre), and urban/industrial/built (approximately 2.46 acres). Surrounding land uses include rural residences and agriculture such as orchards, vineyards, and cropland.

No special-status plants or special-status wildlife were observed during the biological survey, although three special-status wildlife species were determined to have potential to occur within the Study Area. The proposed project involves the construction of a mixed-light cannabis cultivation facility and recommendations, including avoidance and minimization measures to limit or avoid potential impacts, are included in Section 5.1.

Known or potential biological constraints in the Study Area include:

- Potential habitat for special-status and migratory birds including burrowing owl, Swainson's hawk, and white-tailed kite;
- Sensitive habitats, including aquatic resources that are potentially waters of the U.S. and/or State that are subject to regulation by the USACE and/or CVRWQCB; and
- Native oak trees that are subject to regulation by San Joaquin County.

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1.0 INTRODUCTION

This report summarizes the findings of a Biological Resources Assessment (BRA) completed by HELIX Environmental Planning, Inc. (HELIX) for the Garcia Grow Cannabis Facility Project (Project) located in unincorporated San Joaquin County, California. This document addresses the onsite physical features, plant communities present, and the common plant and wildlife species occurring or potentially occurring in the ±52.2-acre Study Area. In addition, the suitability of habitats to support special-status species and sensitive habitats are analyzed, and recommendations are provided for any regulatory permitting or further analysis required prior to development activities occurring on the site consistent with San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJCMCP) requirements (the SJMSCP is discussed below in Section 2.5.1). The proposed project is not a covered activity under the SJMSCP. However, avoidance and minimization measures provided in this document are consistent with SJMSCP requirements for covered species.

1.1 PROJECT DESCRIPTION

The proposed Project includes the construction of a mixed-light cannabis cultivation facility composed of three greenhouses totaling approximately 31,000 square feet and a 2,400 square foot office space.

2.0 REGULATORY FRAMEWORK

Federal, State, and local environmental laws, regulations, and policies relevant to the California Environmental Quality Act (CEQA) review process are summarized below. Applicable CEQA significance criteria are also addressed in this section.

2.1 FEDERAL REGULATIONS

2.1.1 Federal Endangered Species Act

The U.S. Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect species that are endangered or threatened with extinction. FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

FESA prohibits the “take” of endangered or threatened wildlife species. “Take” is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct (FESA Section 3 [(3) (19)]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 CFR §17.3). Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR §17.3). Actions that result in take can result in civil or criminal penalties.

In the context of the proposed Project, FESA consultation with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) would be initiated if development resulted in the potential for take of a threatened or endangered species or if issuance of a Section 404 permit or other federal agency action could result in take of an endangered species or adversely modify critical habitat of such a species.

2.1.2 Migratory Bird Treaty Act

Raptors, migratory birds, and other avian species are protected by a number of State and federal laws. The federal Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior.

2.1.3 The Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (Eagle Act) prohibits the taking or possession of and commerce in bald and golden eagles with limited exceptions. Under the Eagle Act, it is a violation to "*take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof.*" Take is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, and disturb. Disturb is further defined in 50 CFR Part 22.3 as "*to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.*"

2.2 STATE JURISDICTION

2.2.1 California Endangered Species Act

The State of California enacted the California Endangered Species Act (CESA) in 1984. CESA is similar to the FESA but pertains to State-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Wildlife (CDFW), when preparing CEQA documents. The purpose is to ensure that the State lead agency actions do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available (Fish and Game Code §2080). CESA directs agencies to consult with CDFW on projects or actions that could affect listed species. It also directs CDFW to determine whether jeopardy would occur and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. CESA allows CDFW to authorize exceptions to the State's prohibition against take of a listed species if the "take" of a listed species is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code § 2081).

2.2.2 California Department of Fish and Game Codes

A number of species have been designated as "fully protected" species under Sections 5515, 5050, 3511, and 4700 of the Fish and Game Code, but are not listed as endangered (Section 2062) or threatened (Section 2067) species under CESA. Except for take related to scientific research, all take of fully protected species is prohibited. The California Fish and Game Code defines take as "*hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.*" Additionally, Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibits the killing of birds or the destruction of bird nests.

2.2.3 Native Plant Protection Act

The Native Plant Protection Act (NPPA), enacted in 1977, allows the Fish and Game Commission to designate plants as rare or endangered. The NPPA prohibits take of endangered or rare native plants, with some exceptions for agricultural and nursery operations and emergencies. Vegetation removal from canals, roads, and other sites, changes in land use, and certain other situations require proper advance notification to CDFW.

2.3 JURISDICTIONAL WATERS

2.3.1 Federal Jurisdiction

Any person, firm, or agency planning to alter or work in "waters of the U.S.," including the discharge of dredged or fill material, must first obtain authorization from the USACE under Section 404 of the Clean Water Act (CWA; 33 USC 1344). Permits, licenses, variances, or similar authorization may also be required by other federal, state, and local statutes. Section 10 of the Rivers and Harbors Act prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from USACE (33 USC 403).

Waters of the U.S. generally consist of the following four categories of regulated waters:

- The territorial seas and traditional navigable waters;
- Tributaries to those waters;
- Certain lakes, ponds, and impoundments; and
- Wetlands adjacent to jurisdictional waters.

Features generally not considered waters of the U.S. include the following:

- Groundwater
- Diffuse stormwater run-off
- Manmade ditches constructed wholly in uplands
- Prior converted cropland (PCC)
- Artificially irrigated areas
- Artificial lakes and ponds
- Water-filled depressions incidental to mining or construction activity
- Stormwater control features
- Groundwater recharge, water reuse, and wastewater recycling structures
- Waste treatment systems

With non-tidal waters, in the absence of adjacent wetlands, the extent of USACE jurisdiction extends to the ordinary high water mark (OHWM) – the line on the shore established by fluctuations of water and indicated by a clear, natural line impressed on the bank, shelving, changes in soil character, destruction of terrestrial vegetation, or the presence of litter and debris. Wetlands are defined in 33 CFR Part 328 as:

> *"those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."*

Federal and state regulations pertaining to waters of the U.S., including wetlands, are discussed below.

Clean Water Act (33 USC 1251-1376). The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. must obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Control Board (RWQCB) administers the certification program in California and may require State Water Quality Certification before other permits are issued.

Section 402 establishes a permitting system for the discharge of any pollutant (except dredged or fill material) into waters of the U.S.

Section 404 establishes a permit program administered by USACE that regulates the discharge of dredged or fill material into waters of the U.S. (including wetlands). Implementing regulations by USACE are found at 33 CFR Parts 320-332. The Section 404 (b)(1) Guidelines were developed by the USEPA in conjunction with USACE (40 CFR Part 230), allowing the discharge of dredged or fill material for non-water dependent uses into special aquatic sites only if there is no practicable alternative that would have less adverse impacts.

2.3.2 State Jurisdiction

Regional Water Quality Control Board

Any action requiring a CWA Section 404 permit, or a Rivers and Harbors Act Section 10 permit, must also obtain a CWA Section 401 Water Quality Certification. The State of California Water Quality Certification (WQC) Program was formally initiated by the State Water Resources Control Board (SWRCB) in 1990 under the requirements stipulated by Section 401 of the Federal Clean Water Act. Although the Clean Water Act is a Federal law, Section 401 of the CWA recognizes that states have the primary authority and responsibility for setting water quality standards. In California, under Section 401, the State and Regional Water Boards are the authorities that certify that issuance of a federal license or permit does not violate California's water quality standards (i.e., that they do not violate Porter-Cologne and the Water Code). The WQC Program currently issues the WQC for discharges requiring USACE permits for fill and dredge discharges within Waters of the United States, and now also implements the State's wetland protection and hydromodification regulation program under the Porter Cologne Water Quality Control Act.

On May 28, 2020, the SWRCB implemented the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures) for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California (SWRCB 2019). The Procedures consist of four major elements:

I. A wetland definition;
II. A framework for determining if a feature that meets the wetland definition is a water of the state;
III. Wetland delineation procedures; and
IV. Procedures for the submittal, review, and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities.

Under the Procedures and the State Water Code (Water Code §13050(e)), "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state." "Waters of the State" includes all "Waters of the U.S."

More specifically, a wetland is defined as: "*An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation*." The wetland definition encompasses the full range of wetland types commonly recognized in California, including some features not protected under federal law, and reflects current scientific understanding of the formation and functioning of wetlands (SWRCB 2019).

Unless excluded by the Procedures, any activity that could result in discharge of dredged or fill material to Waters of the State, which includes Waters of the U.S. and non-federal Waters of the State, requires filing of an application under the Procedures.

California Department of Fish and Wildlife

The CDFW is a trustee agency that has jurisdiction under Section 1600 et seq. of the California Fish and Game Code. Under Sections 1602 and 1603, a private party must notify CDFW if a proposed project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds…except when the department has been notified pursuant to Section 1601." Additionally, CDFW asserts jurisdiction over native riparian habitat adjacent to aquatic features, including native trees over four inches in diameter at breast height (DBH). If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures. Generally, CDFW recommends submitting an application for a Streambed Alteration Agreement (SAA) for any work done within the lateral limit of water flow or the edge of riparian vegetation, whichever is greater.

2.4 CEQA SIGNIFICANCE

Section 15064.7 of the State CEQA Guidelines encourages local agencies to develop and publish the thresholds that 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 expanded Initial Study Checklist included in Appendix G of the State 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 the 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 the 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 the CDFW or USFWS;

- Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;

- 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 (NCCP), or other approved local, regional, or state habitat conservation plan.

An evaluation of whether or not 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.

2.4.1 California Native Plant Society

The California Native Plant Society (CNPS) maintains a rank of plant species native to California that have low population numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the *Inventory of Rare and Endangered Vascular Plants of California*. Potential impacts to populations of CNPS-ranked plants receive consideration under CEQA review. The following identifies the definitions of the CNPS Rare Plant Ranking System:

Rank 1A: Plants presumed Extinct in California and either rare or extinct elsewhere

Rank 1B: Plants Rare, Threatened, or Endangered in California and elsewhere

Rank 2A: Plants presumed extirpated in California but common elsewhere

Rank 2B: Plants Rare, Threatened, or Endangered in California, but more common elsewhere

Rank 3: Plants about which we need more information – A Review List

All plants appearing on CNPS Rank 1 or 2 are considered to meet CEQA Guidelines Section 15380 criteria. While only some of the plants ranked 3 meet the definitions of threatened or endangered species, the CNPS recommends that all Rank 3 plants be evaluated for consideration under CEQA. Furthermore, the CNPS Rare Plant Rankings include levels of threat for each species. These threat ranks include the following:

0.1 - Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat);

0.2 - Moderately threatened in California (20 to 80% occurrences threatened/moderate degree and immediacy of threat); and

0.3 - Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known).

Threat ranks do not designate a change of environmental protections, so that each species (i.e., CRPR 1B.1, CRPR 1B.2, CRPR 1B.3, etc.), be fully considered during preparation of environmental documents under CEQA.

2.4.2 California Department of Fish and Wildlife Species of Concern

Additional fish, amphibian, reptile, bird, and mammal species may receive consideration by CDFW and lead agencies during the CEQA process, in addition to species that are formally listed under FESA and CESA or listed as fully protected. These species are included on the *Special Animals List*, which is maintained by CDFW. This list tracks species in California whose numbers, reproductive success, or habitat may be in decline. In addition to "Species of Special Concern" (SSC), the *Special Animals List* includes species that are tracked in the California Natural Diversity Database (CNDDB) but warrant no legal protection. These species are identified as "California Special Animals" (CSA).

2.5 LOCAL POLICIES AND REGULATIONS

2.5.1 San Joaquin County Multi-Species Habitat Conservation and Open Space Plan

The San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJCMSCP) is intended to provide a strategy for balancing the need to conserve open space and the need to convert open space to non-open space uses while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the Federal Endangered Species Act (ESA) or the CESA; providing and maintaining multiple-use Open Spaces which contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to Project Proponents and society at large.

The nature of the proposed project precludes it from coverage under the SJCMSCP, but recommended measures in this document are consistent with SJCMSCP requirements.

2.5.2 San Joaquin County General Plan

The Project is subject to the San Joaquin County General Plan (General Plan), Development Title 9, Division 15, *Natural Resources Regulations* (Chapter 9-1505). Chapter 9-1505 of the Development Title is intended to preserve the County's tree resources, which includes native oak trees, heritage oak trees, and historical trees. Section 9-1505.3 details tree removal requirements and states that an approved Improvement Plan application, as specified in Chapter 9-884, will be required if any of these trees are proposed to be removed, unless exempted by Sections 9-1505.8 or 9-1505.9.

3.0 METHODS

Available information pertaining to the natural resources of the region was reviewed prior to conducting the field survey. The following published information was reviewed for this BRA:

- California Department of Fish and Wildlife (CDFW). 2022. *California Natural Diversity Database* (CNDDB); For: *Lodi South, Waterloo, Linden, Stockton West, Stockton East, Peters, Lathrop, Manteca,* and *Avena* USGS 7.5-minute series quadrangles, Sacramento, CA. Accessed [August 18, 2022];

- California Native Plant Society (CNPS). 2022. *Inventory of Rare and Endangered Plants* (online edition, v8-03 0.45) For: *Lodi South, Waterloo, Linden, Stockton West, Stockton East, Peters, Lathrop, Manteca,* and *Avena* USGS 7.5-minute series quadrangles, Sacramento, CA. Accessed [August 18, 2022];

- U.S. Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS). 1993. *San Joaquin County, California*. USDA, NRCS, in cooperation with the Regents of the University of California (Agricultural Experiment Station);

- USDA, NRCS. 2022. *Web Soil Survey*. Available at: http://websoilsurvey.sc.egov.usda.gov. Accessed [August 18, 2022];

- U.S. Fish and Wildlife Service (USFWS). 2022. *Information for Planning and Consultation* (IPaC) *Garcia Grow Project, San Joaquin County, California.* Accessed [August 18, 2022]; and

- U.S. Geological Survey (USGS). 2021. *Stockton East, California*. 7.5-minute series topographic quadrangle. United States Department of Interior.

Prior to conducting the biological field survey, existing information concerning known habitats and special-status species that may occur in the Study Area was reviewed. The results of the database queries for the Study Area are summarized in Appendix A. The biological field survey was conducted on August 8, 2022, by HELIX biologist Greg Davis. The weather during the field survey was sunny and clear with an average temperature of 77°F. The Study Area was systematically surveyed on foot to ensure total search coverage, with special attention given to portions of the Study Area with the potential to support special-status species and sensitive habitats. The HELIX biologist used binoculars to further extend site coverage and identify species observed. All plant and animal species observed were recorded and all biological communities occurring onsite were characterized, as well as adjacent areas outside of the subject property. All resources of interest were mapped with Global Positioning System (GPS)-capable tablets equipped with GPS receivers running ESRI Collector for ArcGIS with sub-meter accuracy.

Following the field survey, the potential for each species identified in the database query to occur within the Study Area was determined based on the site survey, soils, habitats present within the Study Area, and species-specific information, as shown in Appendix B.

4.0 RESULTS

4.1 SITE LOCATION AND DESCRIPTION

The ±52.2-acre Study Area is located in unincorporated San Joaquin County, California. The site is located approximately 1.3 miles east of Stockton, immediately west of Alpine Road, and is situated in Campo De Los Franceses Land Grant, Mount Diablo Meridian, and is depicted on the USGS *Stockton East, CA* 7.5-minute quadrangle map (Figures 1 and 2). The Study Area is composed of the property associated with the San Joaquin County APN 101-026-030. A 500-foot buffer of the project footprint was assessed, where accessible, to evaluate adjacent biological resources that may relate to the proposed project. The project footprint and the 500-foot buffer encompass the Study Area assessed by HELIX. The Study Area is situated within a flat valley and is partially undeveloped with a majority of the site being utilized as a peach orchard. The approximate center of the Study Area is at latitude, 37.9725633 and longitude -121.19003689, NAD 83. An aerial image of the Study Area is included as Figure 3.

4.2 PHYSICAL FEATURES

4.2.1 Topography and Drainage

Terrain in the immediate vicinity of the Study Area is generally flat to gently sloped (Figure 2). The elevation on the site is approximately 40 to 50 feet above MSL and the Study Area is located in the Upper Calaveras watershed (USGS Hydrologic Unit Code [HUC8] 18040011).

Within the Study Area, there are irrigation lines associated with the peach orchard, but there are no ditches present that drain the site. The site has no apparent natural source of water other than direct precipitation.

4.2.2 Soils

Three soil map units (NRCS 2022) are mapped within the Study Area which includes: Galt clay, 0 to 1 percent slopes (160), Hollenbeck silty clay, 0 to 2 percent slopes (173), and Jacktone clay, 0 to 2 percent slopes (180) (Figure 4).

Galt clay, 0 to 1 percent slopes (160): This soil occurs on basin floors on fan remnants between 10 to 140 feet above MSL and consists of clayey alluvium derived from mixed rock sources over cemented alluvium. A typical soil profile consists of clay from 0 to 32 inches and cemented material from 32 to 60 inches. Galt soils are somewhat poorly drained with a frequency of ponding and flooding being rare and frequent, respectively, and a depth to water table of 5 to 32 inches. This soil is rated as hydric.

Hollenbeck silty clay, 0 to 2 percent slopes (173): This soil occurs on hills between 20 to 100 feet above MSL and consists of alluvium derived from mixed rock sources (NRCS 2022). A typical soil profile is silty clay from 0 to 10 inches, clay from 10 to 37 inches, silty clay loam from 37 to 42 inches and cemented from 42 to 60 inches (NRCS 2022). Hollenbeck silty clay is a moderately well drained soil with a frequency of ponding and flooding of “none” and “rare”, respectively, and a depth to water table of more than 80 inches (NRCS 2022). This soil unit is not considered hydric (NRCS 2022).

Jacktone clay, 0 to 2 percent slopes (180): This soil occurs on basin floors between 0 to 100 feet above MSL and consists of alluvium from mixed rock sources. A typical soil profile consists of clay from 0 to 34 inches, indurated from 34 to 37 inches, stratified sandy loam from 37 to 46 inches, and cemented from 46 to 60 inches. Jacktone soils are somewhat poorly drained with a frequency of ponding and flooding being rare and none, respectively, and a depth to water table of 0 inches. This soil is rated as hydric.

4.3 BIOLOGICAL COMMUNITIES

Four biological communities occur within the Study Area: ruderal habitat, orchards and vineyards, seasonal wetland, and urban/industrial/built areas (Figure 5). The seasonal wetland feature is described in Section 4.4 and all other semi-natural communities are described below. The urban/industrial/built areas represent a small portion of Alpine Road that borders the Study Area, which is not further described in this report. The biological communities in this report are classified based on the SJMSCP vegetation types. A comprehensive list of all plant and wildlife species observed within the Study Area in these habitats is provided in Appendix C and Representative Site Photographs are included in Appendix D.

4.3.1 Ruderal

The ruderal habitat comprises approximately 4.12 acres of the Study Area and includes scattered oak and ornamental trees, as well as disturbed areas. This habitat is primarily characterized by an assemblage of ruderal herbs and forbs that colonize disturbed landscapes. Portions of this community are barren, but the dominant vegetation includes prickly lettuce (*Lactuca serriola*), summer mustard (*Hirschfeldia incana*), and tree of heaven (*Ailanthus altissima*).

4.3.2 Orchards and Vineyards

Most of the Study Area is occupied by a peach orchard, which comprises approximately 45.57 acres of the site. This community is relatively void of herbaceous plants as it is managed for agricultural purposes.

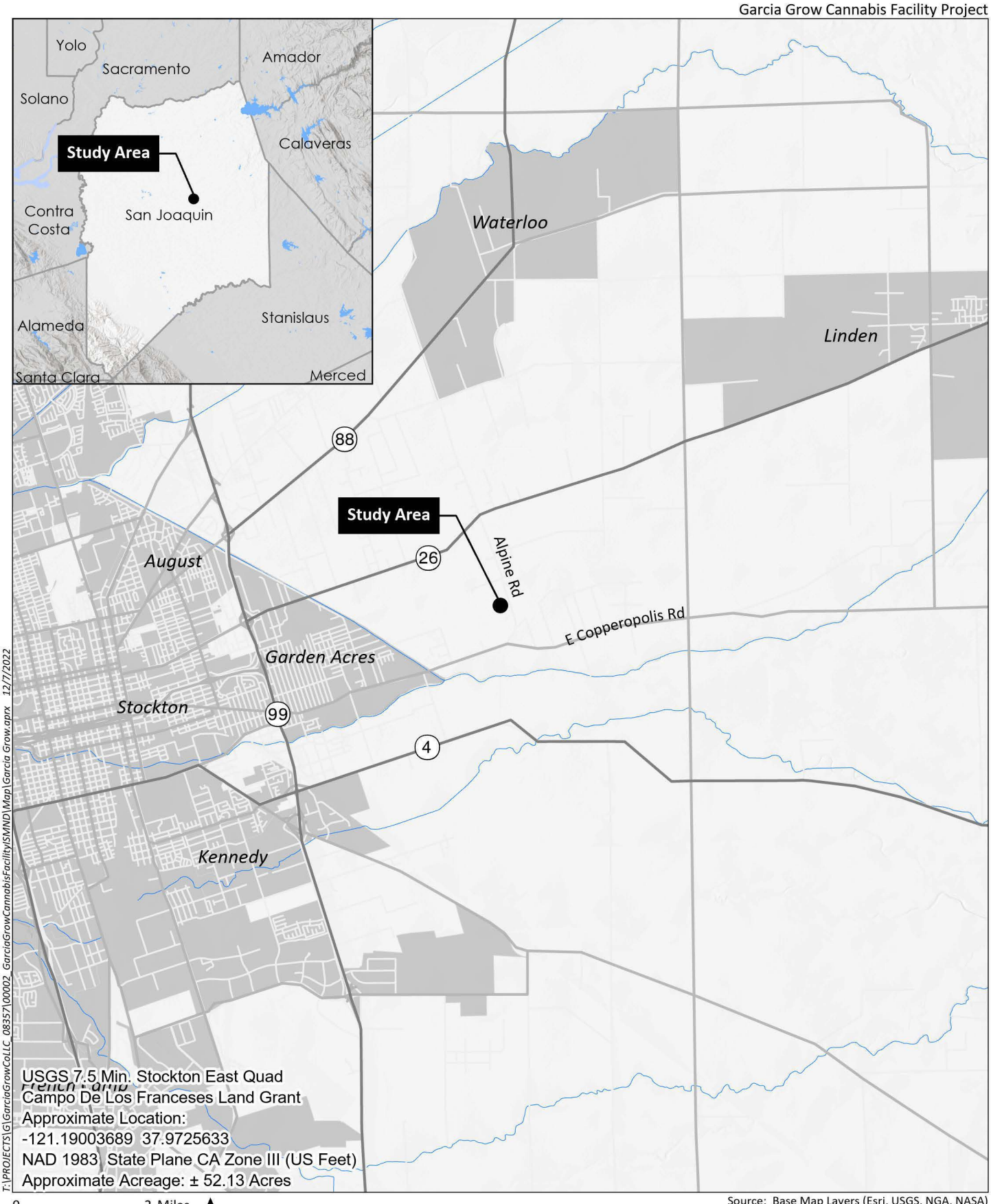
4.4 AQUATIC RESOURCES

4.4.1 Seasonal Wetland

Approximately 0.05 acre of seasonal wetland constituent habitat occurs within the northeastern portion of the Study Area. This wetland has formed as a result of excess irrigation water that is discharged from a plastic pipe that emerges in the center of the feature. Vegetation observed in the seasonal wetland includes yellow bristlegrass (*Setaria pumila*), dallis grass (*Paspalum dilatum*), and tall flatsedge (*Cyperus eragrostis*). Portions of the feature had ponded water and saturated areas with algal matting present. Additionally, mottled soil was observed within 12 inches of the ground surface.

4.5 SPECIAL-STATUS SPECIES

Special-status species are plant and wildlife species that have been afforded special recognition by federal, State, or local resource agencies or organizations. They are generally of relatively limited



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Source: Base Map Layers (Esri, USGS, NGA, NASA)

HELIX Environmental Planning

Site and Vicinity Map

Figure 1

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HELIX Environmental Planning

USGS Topographic Map

Figure 2

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0 300 Feet

Source: Aerial (Nearmap, 6/6/2022)

HELIX Environmental Planning

Aerial Map

Figure 3

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0 300 Feet

Source: NRCS, 2022; Aerial (Nearmap, 6/6/2022)

HELIX Environmental Planning

Soils Map

Figure 4

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Source: Aerial (Nearmap, 6/6/2022)

HELIX Environmental Planning

Biological Communities Map

Figure 5

distribution and may require specialized habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Listed or proposed for listing under CESA or FESA;
- Protected under other regulations (e.g., the SJMSCP, MBTA);
- Included on the CDFW Special Animals List or Watch List;
- Identified as Rare Plant Rank 1 to 3 by CNPS; or
- Receive consideration during environmental review under CEQA.

Special-status species considered for this analysis are based on queries of the CNDDB, the USFWS, and CNPS ranked species (online versions) for the *Stockton South, CA* USGS quadrangle and eight surrounding quadrangles. Appendix B includes the common name and scientific name for each species, regulatory status (federal, State, local, CNPS), habitat descriptions, and potential for occurrence within the Study Area. The following set of criteria has been used to determine each species' potential for occurrence within the Study Area:

Will Not Occur: Species is either sessile (i.e., plants) or so limited to a particular habitat that it cannot disperse on its own and/or habitat suitable for its establishment and survival does not occur on the Study Area;

Not Expected: Species moves freely and might disperse through or across the Study Area, but suitable habitat for residence or breeding does not occur in the Study Area, potential for an individual of the species to disperse through or forage in the site cannot be excluded with 100% certainty;

Presumed Absent: Habitat suitable for residence and breeding occurs in the Study Area; however, focused surveys conducted for the current project were negative;

May Occur: Species was not observed on the site and breeding habitat is not present but the species has the potential to utilize the site for dispersal;

High: Habitat suitable for residence and breeding occurs in the Study Area and the species has been recorded recently in or near the Study Area, but was not observed during surveys for the current project; and

Present: The species was observed during biological surveys for the current project and is assumed to occupy the Study Area or utilize the Study Area during some portion of its life cycle.

Only those species that are known to be present, have a high potential to occur, or may occur are discussed further in the following sections. Species that are not expected to occur are briefly discussed in Appendix B of this document.

4.5.1 Listed and Special-Status Plants

According to the database queries, 18 listed and/or special-status plants have the potential to occur onsite or in the vicinity of the Study Area. Based on field observations, published information, and

literature review, none of these species have potential to occur within the Study Area. The majority of the regional special-status plants identified in the query occur on alkaline sites or within vernal pools, none of which occur in the Study Area.

4.5.2 Listed and Special-Status Wildlife

According to the database query, 22 listed and/or special-status wildlife species have the potential to occur onsite or in the vicinity of the Study Area (CDFW 2022). Based on field observations, published information, and literature review, three special-status wildlife species have the potential to occur within the Study Area. These include burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsonii*), and white-tailed kite (*Elanus leucurus*). These species are discussed in more detail below. In addition to these special-status wildlife species, other birds and raptors protected under federal, State, and local laws/policies also have potential to occur within the Study Area.

Special-Status Wildlife with Potential for Occurrence

Burrowing Owl

Western burrowing owl forages in grasslands, agricultural fields, and disturbed places where burrowing mammals are abundant with low and sparse vegetation. The species nests in burrows, especially those of California ground squirrel, but will use other refuge sites including man-made structures such culverts, pipes, and riprap piles (Shuford and Gardali 2008). In the Central Valley of California, most foraging occurs within a 600-m radius of the nest (Gervais et al. 2003). CNNDB records document burrowing owl in the vicinity of the Study Area and this species could occur overwinter or nest along banks of levees and ditches.

The open ruderal habitat within the Study Area provides suitable foraging habitat for this species, although no burrows or nesting sites were observed during the biological reconnaissance survey. There are four documented CNDDB occurrences of this species within a 5-mile radius of the Study Area, with the closest being approximately 2.8 miles to the south (CDFW 2022). Given that this species is known to occur in the vicinity, there is a low potential for this species to occur within the Study Area. There is potential for direct and indirect effects to burrowing owl if this species were to nest on or adjacent to the site.

Swainson's Hawk

Swainson's hawk is a breeding season migrant in California that winters in South America; migrants typically arrive in mid-April and begin scouting nest locations. Breeding is finished by August and most birds have left the state by late October. Populations are largest in the southern Sacramento Valley and high deserts. A year-round, resident population is present in Solano County (Zeiner et al. 1988-1990).

Swainson's hawks nest in large trees in riparian woodlands, tall trees in upland stands and solitary trees in agricultural areas. Isolation from human foot traffic is important to nest site selection, though hawks are less sensitive to vehicle traffic and are well known to nest along highways. Nests are typically concealed in dense canopy. Individuals exhibit high nest site fidelity. Swainson's hawks forage opportunistically over a large area, soaring up to 10 miles from the nest to hunt small mammals and insects in agricultural fields and grasslands. Suitable foraging habitat is open, with low vegetation (less than 12 inches) and abundant prey. Foraging activity is highest in agricultural fields during activities that

drive prey into the open such as harvesting, disking, flooding, and burning. Swainson's hawk has been expanding its range westward and is now documented as far west as Napa and Sonoma Counties.

There are suitable nesting trees within and near the Study Area, as well as suitable foraging habitat within the ruderal community of the Study Area. There are many documented CNDDB occurrences within 5 miles of the Study Area, with the closest being approximately 1 mile to the northwest (CDFW 2022). Given that suitable nesting and foraging habitat is present in the Study Area, and it is known to occur in the vicinity, Swainson's hawk has a high potential to occur within the Study Area.

White-Tailed Kite

The white-tailed kite is listed as a CDFW Fully Protected species. This species occurs in a variety of habitats including grassland, agricultural, oak woodland, riparian woodland, open suburban areas, and agriculture fields. Nesting generally occurs within riparian or edge habitats or in lone trees that are adjacent to foraging habitat. Foraging habitat consists of a variety of open habitats that contain a high rodent population; especially grasslands, pastures, alfalfa fields, and other agricultural crops/fields.

The Study Area provides suitable nesting and foraging habitat for this species. Trees suitable for nesting are located in within the ruderal community, and suitable foraging habitat occurs in open areas. There are no documented occurrences of this species within 5 miles of the Study Area (CDFW 2022). Because suitable nesting and foraging habitat is present in the Study Area, white-tailed kite has potential to occur within the Study Area.

Nesting Migratory Birds and Raptors

Migratory birds are protected under the MBTA of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10; this also includes feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Additionally, Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., hawks, owls, eagles, and falcons), including their nests or eggs; and Section 3513 specifically states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

A number of migratory birds and raptors have the potential to nest in or adjacent to the Study Area. Suitable nest locations include trees, shrubs, grass, and bare ground.

4.6 SENSITIVE HABITATS

Sensitive habitats include those that are of special concern to resource agencies or those that are protected under CEQA; Section 1600 of the California Fish and Game Code, which includes riparian areas; and/or Sections 401 and 404 of the Clean Water Act, which include wetlands and other waters of the U.S. Sensitive habitats or resource types within the Study Area are discussed below.

4.6.1 Aquatic Resources

A total of 0.05 acre of aquatic resources was observed within the Study Area consisting of a seasonal wetland that is associated with an irrigation outlet (Figure 5). The aquatic habitat is considered a potential water of the U.S. and water of the State subject to USACE and Central Valley Regional Water Quality Control Board (CVRWQCB) jurisdiction under Sections 404 and 401 of the Clean Water Act.

4.6.2 Wildlife Migration Corridors

Wildlife corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. This fragmentation of habitat can also occur when a portion of one or more habitats is converted into another habitat; for instance, when woodland or scrub habitat is altered or converted into grasslands after a disturbance such as fire, mudslide, or construction activities. Wildlife corridors mitigate the effects of this fragmentation by: (1) allowing animals to move between remaining habitats thereby permitting depleted populations to be replenished and promoting genetic exchange; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk of catastrophic events (such as fire or disease) on population or local species extinction; and (3) serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs.

The Study Area is surrounded by orchards and rural residential properties. Although there is a seasonal wetland present, it is not hydrologically connected to other aquatic resources. The communities within the site do not function as a wildlife migration corridor.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The Study Area is comprised of several SJMSCP vegetation types, including orchards and vineyards (approximately 45.57 acres), ruderal (approximately 4.12 acres), seasonal wetland (approximately 0.05 acre), and urban/industrial/built (approximately 2.46 acre). Surrounding land uses include rural residences and agriculture such as orchards, vineyards, and cropland.

No special-status plants or special-status wildlife were observed during the biological survey, although three special-status wildlife species were determined to have potential to occur within the Study Area. Recommendations, including avoidance and minimization measures to limit or avoid potential impacts, are included in Section 5.1.

Known or potential biological constraints in the Study Area include:

- Potential habitat for special-status and migratory birds including burrowing owl, Swainson's hawk, and white-tailed kite;
- Sensitive habitats, including potential waters of the U.S. and/or State that are subject to regulation by the USACE and/or CVRWQCB; and
- Native oak trees that are subject to regulation by San Joaquin County.

5.1 RECOMMENDATIONS

5.1.1 Burrowing Owl

Burrowing owl has a low potential to occur within the Study Area. Neither this species nor burrowing mammals were observed during the biological survey. In addition, burrows were not observed within the Study Area. Impacts to this species may require consultation with CDFW. To avoid potential impacts to this species, the following measures are provided as recommendations to be implemented prior to construction which are sourced from the SJMSCP:

The presence of ground squirrels and squirrel burrows are attractive to burrowing owls. Burrowing owls may therefore be discouraged from entering or occupying construction areas by discouraging the presence of ground squirrels. In the event of ground squirrels occupying the site and creating burrows, the Project Proponent should prevent ground squirrels from occupying the project site early in the planning process by employing one of the following practices:

A. The Project Proponent may plant new vegetation or retain existing vegetation entirely covering the site at a height of approximately 36" above the ground. Vegetation should be retained until construction begins. Vegetation will discourage both ground squirrel and owl use of the site.

B. Alternatively, if burrowing owls are not known or suspected on a project site and the area is an unlikely occupation site for red-legged frogs, San Joaquin kit fox, or tiger salamanders: The Project Proponent may disc or plow the entire project site to destroy any ground squirrel burrows. At the same time burrows are destroyed, ground squirrels should be removed through one of the following approved methods to prevent reoccupation of the project site. Detailed descriptions of these methods are included in Appendix A of the SJMSCP, Protecting Endangered Species, Interim Measures for Use of Pesticides in San Joaquin County, dated March 2000:

    1. **Anticoagulants**. Establish bait stations using the approved rodenticide anticoagulants Chlorophacinone or Diphacinone. Rodenticides shall be used in compliance with U.S. Environmental Protection Agency label standards and as directed by the San Joaquin County Agricultural Commissioner.

    2. **Zinc Phosphide**. Establish bait stations with non-treated grain 5-7 calendar days in advance of rodenticide application, then apply Zinc Phosphide to bait stations. Rodenticides shall be used in compliance with U.S. Environmental Protection Agency label standards and as directed by the San Joaquin County Agricultural Commissioner.

    3. **Fumigants**. Use below-ground gas cartridges or pellets and seal burrows. Approved fumigants include Aluminum Phosphide (Fumitoxin, Phostoxin) and gas cartridges sold by the local Agricultural Commissioner's office. NOTE: Crumpled newspaper covered with soil is often an effective seal for burrows when fumigants are used. Fumigants shall be used in compliance with U.S. Environmental Protection Agency label standards and as directed by the San Joaquin County Agricultural Commissioner.

    4. **Traps**. For areas with minimal rodent populations, traps may be effective for eliminating rodents. If trapping activities are required, the use of, shall be consistent with all applicable laws and regulations.

If the measures described above were not attempted or were attempted but failed, and burrowing owls are known to occupy the project site, then the following measures shall be implemented:

C. During the non-breeding season (September 1 through January 31) burrowing owls occupying the project site should be evicted from the project site by passive relocation as described in the California Department of Fish and Game's Staff Report on Burrowing Owls (October 1995).

D. During the breeding season (February 1 through August 31) occupied burrows shall not be disturbed and shall be provided with a 75 meter protective buffer until and unless the TAC, with the concurrence of the Permitting Agencies' representatives on the TAC; or unless a qualified biologist approved by the Permitting Agencies verifies through non-invasive means that either: 1) the birds have not begun egg laying, or 2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. Once the fledglings are capable of independent survival, the burrow can be destroyed.

Additional applicable measures relating to nesting special-status birds, including burrowing owls, are further described in Section 5.1.3.

5.1.2 Swainson's Hawk

Swainson's hawk has the potential to utilize the Study Area for nesting and foraging, although nests were not observed during the biological reconnaissance survey. The following mitigation measures are described in the SJMSCP:

The Project Proponent has the option of retaining known or potential Swainson's hawk nest trees (i.e., trees that hawks are known to have nested in within the past three years or trees, such as large oaks, which the hawks prefer for nesting) or removing the nest trees. If the Project Proponent elects to retain a nest tree, and in order to encourage tree retention, the following Incidental Take Minimization Measure shall be implemented during construction activities:

If a nest tree becomes occupied during construction activities, then all construction activities shall remain a distance of two times the dripline of the tree, measured from the nest.

If the Project Proponent elects to remove a nest tree, then nest trees may be removed between September 1 and February 15, when the nests are unoccupied.

Additional applicable measures relating to nesting special-status birds, including Swainson's hawk, are further described in Section 5.1.3.

5.1.3 Nesting Special-Status Birds, Migratory Birds, and Raptors

White-tailed kite, burrowing owl, and Swainson's hawk as well as other migratory birds and raptors protected under federal, State, and/or local laws and policies, have potential to nest and forage within the Study Area. Although no active nests were observed during the field survey, the Study Area and adjacent properties contain suitable habitat to support a variety of nesting birds within trees, shrubs, grass, and on bare ground. If project activities take place during the nesting season (February 1 to August 31), nesting birds may be impacted. If project activities take place outside of the nesting season, no mitigation measures for nesting birds are required.

Active nests and nesting birds are protected by the California Fish and Game Code Sections 3503 and 3503.5, 3513 and the MBTA. Ground-disturbing and other development activities including grading, vegetation clearing, tree removal/trim, and construction could impact nesting birds if these activities occur during the nesting season.

The following measures are recommended to avoid or minimize impacts to nesting birds:

- To avoid impacts to nesting birds, all ground disturbing activity should be completed between September 1 and January 31, if feasible.

- A qualified biologist should conduct a pre-construction nesting bird survey no more than 14 days prior to initiation of project activities that occur during the nesting season. The survey area should include suitable raptor nesting habitat within 500 feet of the project boundary (inaccessible areas outside of the Study Area can be surveyed from the site or from public roads using binoculars or spotting scopes). Areas that have been inactive for more than 14 days during the avian breeding season must be re-surveyed prior to resumption of project activities. If no active nests are identified, no further mitigation is required. If active nests are identified, the following measure should be implemented:

    - A species-specific buffer should be established by a qualified biologist around active nests and no construction activities within the buffer should be allowed until a qualified biologist has determined that the nest is no longer active (i.e., the nestlings have fledged and are no longer reliant on the nest, or the nest has failed). Encroachment into the buffer may occur at the discretion of a qualified biologist. Any encroachment into the buffer should be monitored by a qualified biologist to determine whether nesting birds are being impacted.

- In addition, a qualified biologist should conduct an environmental awareness training to all project-related personnel prior to the initiation of work.

If construction occurs outside of the nesting bird season (September 1 to January 31) a nesting bird survey and environmental training for nesting birds would not be required.

5.1.4 Aquatic Resources

The seasonal wetland within the Study Area is likely to be considered a water of the State, and potentially a water of the U.S., and potentially subject to USACE and CVRWQCB jurisdiction under Sections 404 and 401 of the CWA.

As designed, the proposed project will avoid the seasonal wetland (see Figure 5). The recommended measures for aquatic resources below would assist in addressing potential direct impacts that could occur as a result of the proposed project.

Avoidance measures and best management practices should be implemented to minimize impacts to the seasonal wetland adjacent to the proposed project footprint. If alterations to the current design would result in impacts to this feature, permits will be required from regulatory agencies (i.e., USACE and CVRWQCB). These permits may require an aquatic resource delineation be conducted to quantify environmental impacts associated with the project.

5.1.5 Oak Trees

Native oak trees within the Study Area are subject to regulation by San Joaquin County. If the removal of native oak trees cannot be avoided, the following measures are recommended based on the provisions outlined in Development Title 9-1505:

- **Removal requirements**. The removal of Native Oak Tree, Heritage Oak Tree, or Historical Tree shall require an approved Improvement Plan application, as specified in Chapter 9-884 of the Development Title, and shall be subject to the provisions of Chapter 9-1505, unless exempted by Sections 9-1505.8 or 9-1505.9.
    - **Native Oak Tree**. Removal of a Native Oak Tree shall be permitted subject to an approved Improvement Plan application processed by Staff Review procedure.
- **Replacement**. Trees removed under the provisions of Chapter 9-1505 shall be replaced subject to the following requirements:
    - **Replacement Stock**. Replacement stock shall be of healthy commercial nursery stock or acorns, of the species removed or other approved species, and shall be established and maintained for at least three (3) years.
    - **Location**. Replacement trees shall be planted as near as possible to the location of the removed tree or in an alternative location acceptable to the Review Authority.
    - **Timing**. Replacement stock shall be planted between October 1 and December 31, and no later than twelve (12) months after the date of tree removal.
    - **Number and Maintenance of Replacement Trees**. The number and maintenance of replacement stock shall be as follows:
        - Each Heritage Oak Tree or Historical Tree that has been removed under the provisions of Section 9-1505.3(a) shall be replaced with five (5) trees or acorns, or combination thereof.
        - Each Native Oak Tree that has been removed under the provisions of Section 9-1505.3(b) shall be replaced with three (3) trees or acorns, or combination thereof.
        - The applicant shall be required to demonstrate to the satisfaction of the Review Authority that replacement stock will be planted and maintained in such a manner as to ensure that the survival of said stock at the end of a three (3) year period commencing from the date of planting.
    - **Replacement Security**. The Review Authority may require, as a Condition of Approval, the applicant to provide a performance bond or other financial security to replant any replacement tree found not to be alive at the end of the required three (3) year maintenance period. The form of the bond or other financial security shall be found acceptable by the County Counsel and the amount shall be sufficient to cover the County's cost to replant said trees. The Director shall, upon written request of the

applicant at the end of the maintenance period, determine the health of the replacement trees and release the security, in the event that all replacement trees are alive. In the event that the replacement trees are not alive, the Director shall use all or part of the security to replant said trees. The applicant may be required to provide additional security to ensure maintenance of said trees for an ensuing three (3) year maintenance period.

- **Development Constraints**. To protect and preserve Heritage Oak Trees, Historical Trees, and Native Oak Trees from development and construction activity, the following standards shall be applicable unless otherwise specified:

    - **Grade Changes**. Grade changes near or within the dripline of said trees shall comply with the following restrictions:

        - No grade changes shall occur within six (6) feet of the trunk of the tree.

        - No grade changes shall occur that entail removing or adding more than six (6) inches of soil in the protected zone of the tree.

        - Extensive cuts or fills that are necessary beyond the protected zone shall have adequate drainage to mitigate adverse effects caused by changes in grade elevation.

        - Any grade changes within the protected zone of the tree shall be accomplished so as to prevent soil compaction and injury to or removal of the tree's roots.

    - **Fencing**. Before grading operations may commence, a minimum five (5) foot high chain link fence or other comparable protective fencing shall be installed at the outermost edge of the protected zone of each tree or group of trees. Fencing, however, to protect trees on slops that will not be graded is not required.

        - Fences shall remain in place throughout the entire construction period.

        - No material, machinery, or objects of any kind may be stored within the fenced area.

    - **Trenching**. No trenching whatsoever shall be allowed within the protected zone of subject trees. If underground utility lines must be installed within the protected zone, the conduit shall be installed by boring or drilling through the soil.

    - **Retaining Walls**. In cases where retaining walls are required within the protected zone of the tree, the property owner shall complete said improvement before the completion of grading operations and before commencement of any construction.

- **Paving**. Paving within the dripline of affected trees shall be stringently minimized. If paving is necessary, porous materials such as gravel, loose boulders, and cobbles, brick with sand joints, wood chips, or bark mulch shall be used.

- **Exceptions**. The Development Constraints in this section shall not apply to normal agricultural practices.

6.0 REFERENCES

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Appendix A

CNDDB, CNPS, and USFWS Lists of Regionally Occurring Special-Status Species

The following section contains content that was obtained from a third party and may not achieve the same level of Americans with Disabilities Act (ADA) and Section 508 accessibility as other parts of this document.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Lodi South (3812113) OR Waterloo (3812112) OR Linden (3812111) OR Stockton West (3712183) OR Stockton East (3712182) OR Peters (3712181) OR Lathrop (3712173) OR Manteca (3712172) OR Avena (3712171))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acipenser medirostris pop. 1 green sturgeon - southern DPS	AFCAA01031	Threatened	None	G2T1	S1	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Andrena subapasta An andrenid bee	IIHYM35210	None	None	G1G2	S1S2	
Anniella pulchra Northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cirsium crassicaule slough thistle	PDAST2E0U0	None	None	G1	S1	1B.1
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2T3	S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S1S2	
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta moesta moestan blister beetle	IICOL4C020	None	None	G2	S2	
Melospiza melodia pop. 1 song sparrow ("Modesto" population)	ABPBXA3013	None	None	G5T3?Q	S3?	SSC
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G2G3	S3	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sylvilagus bachmani riparius riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Trichocoronis wrightii var. wrightii Wright's trichocoronis	PDAST9F031	None	None	G4T3	S1	2B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010	None	None	G5	S3	SSC

Record Count: 46

California Native Plant Society

Search Results

21 matches found. Click on scientific name for details

Search Criteria: Quad is one of [**3812113:3812112:3812111:3712183:3712182:3712181:3712173:3712172:3712171**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	CA RARE PLANT RANK	GENERAL HABITATS	MICRO HABITATS	LOWEST ELEVATION (M)	HIGHEST ELEVATION (M)
Astragalus tener var. *tener*	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	1B.2	Playas, Valley and foothill grassland, Vernal pools	Alkaline	1	60
Atriplex cordulata var. *cordulata*	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland	Alkaline (sometimes)	0	560
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	None	None	1B.1	Valley and foothill grassland	Clay (usually)	30	505
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	2B.3	Marshes and swamps		0	2200
Centromadia parryi ssp. *rudis*	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	4.2	Valley and foothill grassland, Vernal pools	Alkaline, Roadsides (sometimes), Seeps, Vernally Mesic	0	100
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	FE	CE	1B.1	Chenopod scrub, Valley and foothill grassland	Alkaline	5	155
Cirsium crassicaule	slough thistle	Asteraceae	annual/perennial herb	May-Aug	None	None	1B.1	Chenopod scrub, Marshes and swamps, Riparian scrub		3	100

Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	1B.2	Chenopod scrub, Cismontane woodland, Valley and foothill grassland	Alkaline	3	790
Eryngium racemosum	Delta button-celery	Apiaceae	annual/perennial herb	(May)Jun-Oct	None	CE	1B.1	Riparian scrub		3	30
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland	Alkaline	1	835
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	4.2	Valley and foothill grassland, Vernal pools	Alkaline (sometimes)	0	505
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	1B.2	Marshes and swamps		0	120
Lasthenia ferrisiae	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	4.2	Vernal pools		20	700
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	1B.2	Marshes and swamps		0	5
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	1B.1	Marshes and swamps, Riparian scrub		0	10
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	1B.2	Marshes and swamps		0	650
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	1B.2	Marshes and swamps		0	3
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	None	None	2B.1	Marshes and swamps, Meadows and seeps, Riparian forest, Vernal pools	Alkaline	5	435

Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	1B.2	Marshes and swamps, Valley and foothill grassland, Vernal pools	0	300
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	None	None	1B.1	Valley and foothill grassland	1	455
Tuctoria greenei	Greene's tuctoria	Poaceae	annual herb	May-Jul(Sep)	FE	CR	1B.1	Vernal pools	30	1070

Showing 1 to 21 of 21 entries

Suggested Citation:
California Native Plant Society, Rare Plant Program. 2022. Rare Plant Inventory (online edition, v9-01 1.5). Website https://www.rareplants.cnps.org [accessed 18 August 2022].

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Project Code: 2022-0076405
Project Name: Garcia Project

August 18, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Project Code: 2022-0076405
Project Name: Garcia Project
Project Type: Field Crop Planting/Production
Project Description: Agricultural development
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.97244715,-121.19178764994744,14z

Counties: San Joaquin County, California

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Riparian Brush Rabbit *Sylvilagus bachmani riparius* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6189	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/321

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/7850

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi*	Threatened

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp *Lepidurus packardi*	Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.
Species profile: https://ecos.fws.gov/ecp/species/2246

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

Agency: HELIX Environmental Planning
Name: Greg Davis
Address: 1677 Eureka Road, Suite 100
City: Roseville
State: CA
Zip: 95661
Email gregd@helixepi.com
Phone: 9164351202

Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Lodi South (3812113) OR Waterloo (3812112) OR Linden (3812111) OR Stockton West (3712183) OR Stockton East (3712182) OR Peters (3712181) OR Lathrop (3712173) OR Manteca (3712172) OR Avena (3712171))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAA01181	***Ambystoma californiense pop. 1*** California tiger salamander - central California DPS	Threatened	Threatened	G2G3T3	S3	WL
AAABF02020	***Spea hammondii*** western spadefoot	None	None	G2G3	S3	SSC
ABNKC06010	***Elanus leucurus*** white-tailed kite	None	None	G5	S3S4	FP
ABNKC19070	***Buteo swainsoni*** Swainson's hawk	None	Threatened	G5	S3	
ABNSB10010	***Athene cunicularia*** burrowing owl	None	None	G4	S3	SSC
ABPBR01030	***Lanius ludovicianus*** loggerhead shrike	None	None	G4	S4	SSC
ABPBW01114	***Vireo bellii pusillus*** least Bell's vireo	Endangered	Endangered	G5T2	S2	
ABPBXA3013	***Melospiza melodia pop. 1*** song sparrow ("Modesto" population)	None	None	G5T3?Q	S3?	SSC
ABPBXB0020	***Agelaius tricolor*** tricolored blackbird	None	Threatened	G1G2	S1S2	SSC
ABPBXB3010	***Xanthocephalus xanthocephalus*** yellow-headed blackbird	None	None	G5	S3	SSC
AFCAA01031	***Acipenser medirostris pop. 1*** green sturgeon - southern DPS	Threatened	None	G2T1	S1	
AFCHA0209K	***Oncorhynchus mykiss irideus pop. 11*** steelhead - Central Valley DPS	Threatened	None	G5T2Q	S2	
AFCHB01040	***Hypomesus transpacificus*** Delta smelt	Threatened	Endangered	G1	S1	
AFCHB03010	***Spirinchus thaleichthys*** longfin smelt	Candidate	Threatened	G5	S1	
AMACC10010	***Antrozous pallidus*** pallid bat	None	None	G4	S3	SSC
AMAEB01021	***Sylvilagus bachmani riparius*** riparian brush rabbit	Endangered	Endangered	G5T1	S1	
ARACC01020	***Anniella pulchra*** Northern California legless lizard	None	None	G3	S3	SSC
ARADB36150	***Thamnophis gigas*** giant gartersnake	Threatened	Threatened	G2	S2	
CTT71130CA	***Valley Oak Woodland*** Valley Oak Woodland	None	None	G3	S2.1	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ICBRA03030	***Branchinecta lynchi*** vernal pool fairy shrimp	Threatened	None	G3	S3	
ICBRA03150	***Branchinecta mesovallensis*** midvalley fairy shrimp	None	None	G2	S2S3	
ICBRA06010	***Linderiella occidentalis*** California linderiella	None	None	G2G3	S2S3	
ICBRA10010	***Lepidurus packardi*** vernal pool tadpole shrimp	Endangered	None	G4	S3S4	
IICOL48011	***Desmocerus californicus dimorphus*** valley elderberry longhorn beetle	Threatened	None	G3T2T3	S3	
IICOL4C020	***Lytta moesta*** moestan blister beetle	None	None	G2	S2	
IIHYM24250	***Bombus occidentalis*** western bumble bee	None	None	G2G3	S1	
IIHYM35210	***Andrena subapasta*** An andrenid bee	None	None	G1G2	S1S2	
IMBIV19010	***Gonidea angulata*** western ridged mussel	None	None	G3	S1S2	
PDAPI0Z0S0	***Eryngium racemosum*** Delta button-celery	None	Endangered	G1	S1	1B.1
PDAPI19030	***Lilaeopsis masonii*** Mason's lilaeopsis	None	Rare	G2	S2	1B.1
PDAST1C011	***Blepharizonia plumosa*** big tarplant	None	None	G1G2	S1S2	1B.1
PDAST2E0U0	***Cirsium crassicaule*** slough thistle	None	None	G1	S1	1B.1
PDAST9F031	***Trichocoronis wrightii var. wrightii*** Wright's trichocoronis	None	None	G4T3	S1	2B.1
PDASTE8470	***Symphyotrichum lentum*** Suisun Marsh aster	None	None	G2	S2	1B.2
PDBRA2R010	***Tropidocarpum capparideum*** caper-fruited tropidocarpum	None	None	G1	S1	1B.1
PDCAB01010	***Brasenia schreberi*** watershield	None	None	G5	S3	2B.3
PDCHE040B0	***Atriplex cordulata var. cordulata*** heartscale	None	None	G3T2	S2	1B.2
PDCHE041F3	***Extriplex joaquinana*** San Joaquin spearscale	None	None	G2	S2	1B.2
PDFAB0F8R1	***Astragalus tener var. tener*** alkali milk-vetch	None	None	G2T1	S1	1B.2
PDFAB250D2	***Lathyrus jepsonii var. jepsonii*** Delta tule pea	None	None	G5T2	S2	1B.2

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDFAB400R5	***Trifolium hydrophilum*** saline clover	None	None	G2	S2	1B.2
PDMAL0H0R3	***Hibiscus lasiocarpos var. occidentalis*** woolly rose-mallow	None	None	G5T3	S3	1B.2
PDRAN0B1J0	***Delphinium recurvatum*** recurved larkspur	None	None	G2?	S2?	1B.2
PDSCR0J0J0	***Chloropyron palmatum*** palmate-bracted bird's-beak	Endangered	Endangered	G1	S1	1B.1
PMALI040Q0	***Sagittaria sanfordii*** Sanford's arrowhead	None	None	G3	S3	1B.2
PMPOA6N010	***Tuctoria greenei*** Greene's tuctoria	Endangered	Rare	G1	S1	1B.1

Record Count: 46

Appendix B

Potential for Special-Status Species to Occur in the Study Area

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Plants			
Astragalus tener var. *tener* Alkali milk-vetch	SJMSCP; 1B.2	An annual herb found in alkaline mesic habitats in playas, valley and foothill grassland (adobe clay soils), and vernal pools in the Central Valley from 1 – 60 meters elevation. Blooms March – June (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable alkaline habitat to support this species.
Atriplex cordulata var. *cordulata* Heartscale	SJMSCP; 1B.2	An annual herb found in saline or alkaline habitats in chenopod scrub, meadows, seeps, and sandy microsites in valley and foothill grasslands from 0 – 560 m elevation. Blooms April – October (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable saline or alkaline habitat to support this species.
Blepharizonia plumosa Big tarplant	1B.1	An annual herb found usually on clay soils in valley and foothill grassland from 30 – 505 meters elevation. Blooms July – October (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable habitat to support this species.
Brasenia scheberi Watershield	2B.3	A rhizomatous aquatic herb found in freshwater marshes and swamps from 30 to 2,200 meters elevation. Blooms June to September (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic habitat to support this species.
Chloropyron palmatum Palmate-bracted bird's-beak	FE; SE; 1B.1	An annual hemiparasitic herb found in alkaline wetlands in chenopod scrub, and valley and foothill grassland from 5 – 155 meters elevation in the Central Valley. Blooms May – October (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable alkaline wetlands to support this species.
Cirsium crassicaule Slough thistle	SJMSCP; 1B.1	An annual/perennial herb found in chenopod scrub, sloughs, and riparian scrub from 3 – 100 meters elevation. Blooms May – August (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable habitat to support this species.
Delphinium recurvatum Recurved larkspur	SJMSCP; 1B.2	A perennial herb found in alkaline microsites in chenopod scrub, cismontane woodland, and valley and foothill grassland from 3 – 79 meters elevation. Blooms March – June (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable alkaline habitat to support this species.
Eryngium racemosum Delta button-celery	SJMSCP; SE; 1B.1	An annual/ perennial herb found in vernally mesic clay depressions in riparian scrub from 3 to 30 meters elevation. Blooms June – September (CNPS 2022).	**Will not occur**. The Study Area does not contain vernal pools or riparian scrub to support this species.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Extriplex joaquinana San Joaquin spearscale	1B.2	An annual herb found in alkaline habitats in chenopod scrub, meadows and seeps, playas, and valley and foothill grassland from 1 – 835 meters elevation. Blooms April – October (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable alkaline habitat to support this species.
Hibiscus lasiocarpos var. *occidentalis* Woolly rose-mallow	SJMSCP; 1B.2	A perennial rhizomatous emergent herb found in freshwater marshes and swamps from 0 – 120 meters elevation, often in riprap along levees. Blooms June – September (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable habitat to support this species.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	SJMSCP; 1B.2	A perennial herb found in freshwater and brackish marshes from 0 – 5 meters elevation. Blooms May – July (September) (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic habitat to support this species.
Lilaeopsis masonii Mason's lilaeopsis	SJMSCP; SR; 1B.1	A perennial rhizomatous herb found in mashes, swamps, and riparian scrub from 0 – 10 meters elevation. Range is restricted to the Delta, Suisun Bay, and San Pablo Bay. Blooms April – November (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic habitat or riparian scrub to support this species.
Sagittaria sanfordii Sanford's arrowhead	SJMSCP; 1B.2	An emergent perennial rhizomatous herb that occurs in standing or slow-moving freshwater habitats including ponds, marshes, and ditches from 0 to 650 meters amsl. Blooming period: May – October (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic habitat to support this species.
Symphyotrichum lentum Suisun Marsh aster	SJMSCP; 1B.2	A perennial rhizomatous herb found in freshwater and brackish marsh from 0 – 3 meters elevation. Blooms May – November (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic habitat to support this species.
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	SJMSCP; 2B.1	An annual herb found in alkaline meadows, seeps, marshes, swamps, riparian forest, and vernal pools from 5 – 435 meters elevation. Nearly extirpated from the Central Valley. Blooms May – September (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic or riparian habitat to support this species.
Trifolium hydrophilum Saline clover	1B.2	An annual herb found in marshes, swamps, mesic alkaline valley and foothill grassland, and vernal pools from 0–- 300 meters elevation. Blooms April – June (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable aquatic or riparian habitat to support this species.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Tropidocarpum capparideum Caper-fruited tropidocarpum	1B.1	An annual herb found on alkaline hills in valley and foothill grassland from 1 – 455 meters elevation. Blooms March – April (CNPS 2022).	**Will not occur**. The Study Area does not contain suitable habitat to support this species.
Tuctoria greenei Greene's tuctoria	SJMSCP; FE; SR; 1B.1	An annual herb found in vernal pools from 30 to 1,070 meters elevation. Blooms May – July (September) (CNPS 2022).	**Will not occur**. The Study Area does not contain vernal pools to support this species.
Animals			
Insects			
Danaus plexippus Monarch butterfly	FCE	The federal listing on December 17, 2020 was for overwintering populations of Monarch butterflies that roost in wind protected tree groves, especially with Eucalyptus sp., and species of pine or cypress with nectar and water sources nearby. Winter roost sites extend along the coast from Mendocino County to Baja California. As caterpillars, monarchs feed exclusively on the leaves of milkweed (Asclepias sp.) (Nial et al. 2019 and USFWS 2020). Monarch butterfly migration routes pass east over the Sierra Nevada in the fall and back to the California coast in the spring (USFWS 2020). The overwintering population is located along the Coast while summer breeding areas occur in interior California and North America with spring breeding areas located further east (USFWS 2020).	**Will not occur.** The Study Area does not contain suitable habitat or milkweed plants to support this species.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	SJMSCP; FT	This species occurs on elderberry (*Sambucus* sp.) shrubs usually associated with riparian areas. Plants with a 1-inch or greater diameter are required for breeding. Adults emerge in spring until early summer and exit holes are visible on shrub stems year-round.	**Will not occur.** Elderberry shrubs that provide habitat for valley elderberry longhorn beetle are not present in the Study Area.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Crustaceans			
Branchinecta lynchi Vernal pool fairy shrimp	SJMSCP; FT	Generally occurs in vernal pools but may also be found in seasonal wetlands, swales, and alkali pools. Typically found in turbid water but also occurs in clear water with abundant aquatic vegetation.	**Will not occur**. Vernal pools and other suitable aquatic habitats do not occur in the Study Area.
Lepidurus packardi Vernal pool tadpole shrimp	SJMSCP; FE	Occurs in a variety of seasonally inundated habitats, particularly low-alkalinity seasonal pools in grasslands. Known to occur in vernal pools, wetlands, and other freshwater habitats. Generally occurs in larger, deeper features where dissolved oxygen levels are higher and features remain inundated for longer periods.	**Will not occur**. Vernal pools and other suitable aquatic habitats do not occur in the Study Area.
Fishes			
Acipenser medirostris pop. 1 Green sturgeon – southern DPS	SJMSCP; FT	Spawn in freshwater streams, in fast, deep water, over gravel, cobble, or boulders. Juveniles inhabit estuarine waters for 1-4 years until dispersing into coastal marine waters as adults. Adults return to spawn in fresh water every 6-10 years. Sacramento River watershed, including the Feather River, is the only known historical and present spawning areas for green sturgeon (NMFS 2018).	**Will not occur**. The Study Area lacks suitable aquatic habitat for this species.
Hypomesus transpacificus Delta smelt	SJMSCP; FT	Occurs in estuarine waters. Majority of life span is spent within the freshwater outskirts of the mixing zone (saltwater-freshwater interface) within the Delta.	**Will not occur**. Estuarine waters do not occur in the Study Area.
Oncorhynchus mykiss irideus pop. 11 Steelhead, Central Valley DPS	FT	Found in cool, clear, fast-flowing permanent streams and rivers with riffles and ample riparian vegetation cover or overhanging banks. Spawning occurs in streams with pool and riffle complexes. This species requires cold water and gravelly streambed to successfully breed.	**Will not occur**. The Study Area lacks suitable aquatic habitat for this species.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Spirinchus thaleichthys Longfin smelt	SJMSCP; FCE; ST	The longfin smelt is a pelagic estuarine fish that spawns in freshwater and then moves downstream to brackish water to rear. They usually live for 2 years, spawn, and then die, although some individuals may spawn as 1- or 3-year-old fish before dying. Longfin smelt in the Bay-Delta may spawn as early as November and as late as June, although spawning typically occurs from January to April. The known range of the longfin smelt extends from the San Francisco Bay-Delta in California northward to the Cook Inlet in Alaska. Longfin smelt have been observed as far upstream as Isleton in the Sacramento River, Santa Clara shoal in the San Joaquin system, Hog Slough off the South-Fork Mokelumne River, and in Old River south of Indian Slough (USFWS 2016).	**Will not occur**. The Study Area lacks suitable aquatic habitat for this species.
Amphibians			
Ambystoma californiense pop. 1 California tiger salamander – central California DPS	SJMSCP; FT; ST	California tiger salamanders are generally restricted to vernal pools and seasonal ponds, including many constructed stock ponds, in grassland and oak savannah plant communities from sea level to about 1,500 feet in central California. This species spends the majority of its life in upland areas in the vicinity of suitable breeding ponds, where it inhabits rodent burrows. In order to provide suitable habitat for this species, suitable breeding habitat must be present in combination with suitable upland habitat. In the Coastal region, populations are scattered from Sonoma County in the northern San Francisco Bay Area to Santa Barbara County, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern counties (USFWS 2017).	**Will not occur.** The Study Area, and surrounding area, does not provide suitable habitat for this species. There are no documented CNDDB occurrences within 5 miles of the Study Area (CDFW 2022).

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Spea hammondii Western spadefoot	SJMSCP; SSC	Occurs in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, and playas. This species spends the majority of its life underground and typically emerges between October to May to breed. Breeding occurs in vernal pools, depressional wetlands, and puddles. Breeding sites must remain inundated for at least 30 days for larvae to mature.	**Will not occur**. The seasonal wetland feature within the study area does not provide suitable breeding habitat for this species given that it is associated mostly with saturated soils from irrigation runoff. Additionally, the surrounding area does not provide suitable upland habitat for this species. There are no documented occurrences within 5 miles of the Study Area (CDFW 2022).
Reptiles			
Anniella pulchra Northern California legless lizard	SSC	A fossorial species that occupies loose soil in stabilized dunes, coastal scrub, chaparral and oak woodlands. Found in loose friable (usually sandy) soils under leaf litter or other debris where vegetation is sparse along beaches, chaparral, pine-oak woodland, stream terraces and riparian. Highly dependent on soil moisture (Jennings and Hayes 1994).	**Will not occur**. The Study Area does not provide suitable habitat to support this species.
Thamnophis gigas Giant garter snake	SJMSCP; FT; ST	Occurs in aquatic habitats with open, sunny areas for basking, vegetation cover along banks, and abundant prey. Typically occurs in agricultural wetlands, canals, and sloughs; especially near rice fields. Upland habitat with small mammal burrows present above flood level is also required for this species.	**Will not occur**. Suitable aquatic habitat does not occur in or near the Study Area.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Birds			
Agelaius tricolor Tricolored blackbird	SJMSCP; ST; SSC	Nests in colonies near open fresh water; usually within emergent wetland habitat with tall, dense cattails, tule, willow, and other marshy vegetation. Forages in open grassland, wetland, and agricultural habitats.	**Will not occur**. Suitable nest sites do not occur in or near the Study Area. There is one documented CNDDB occurrence within 5 miles of the Study Area, however it is associated with a historic account from 1879 (CDFW 2022).
Athene cunicularia Burrowing owl	SJMSCP; SSC	Forages in grasslands, agricultural fields, and disturbed places where burrowing mammals are abundant with low and sparse vegetation. Nests in burrows, especially those of California ground squirrel, but will use other refuge sites (*Otospermophilus beecheyi*; Shuford and Gardali 2008). In the Central Valley of California, most foraging occurs within a 600-m radius of the nest (Gervais et al. 2003).	**May occur**. There is open ruderal habitat within the Study Area that provides suitable foraging habitat for this species, although no burrows were observed during the biological reconnaissance survey. There are four documented CNDDB occurrences of this species within a 5-mile radius of the Study Area, with the closest being approximately 2.8 miles to the south (CDFW 2022). Given that this species is known to occur in the vicinity, there is a low potential for this species to occur within the Study Area.
Buteo swainsoni Swainson's hawk	SJMSCP; ST	Found in a variety of open habitats including grasslands, agricultural areas, and open woodlands. Often nests peripherally to riparian systems or other aquatic habitats; nests in lone trees or groves of trees in agricultural fields, residential trees, or road break trees when aquatic habitat is absent. Prefers nest sites adjacent to open areas suitable for foraging. Trees greater than 30 feet in height are generally used for nesting.	**High**. There are suitable nesting trees within and near the Study Area, as well as suitable foraging habitat within the ruderal community. There are many documented CNDDB occurrences within 5 miles of the Study Area, with the closest being approximately 1 mile to the northwest (CDFW 2022).

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Elanus leucurus White-tailed kite	SJMSCP; FP	Occurs in a variety of habitats including grassland, agricultural, oak woodland, riparian woodland, open suburban areas, and agriculture fields. Nests in lone trees or trees near aquatic habitats. Foraging occurs within un-grazed or lightly-grazed fields, agricultural areas, and open grasslands.	**May occur**. Suitable foraging and nesting habitat occurs within the Study Area. There are no documented occurrences within 5 miles of the Study Area (CDFW 2022).
Lanius ludovicianus Loggerhead shrike	SJMSCP; SSC	Loggerhead shrike prefers open habitats with scattered shrubs, trees, posts, or other perches. It can be found in shrublands or open woodlands with bare ground, or sparse herbaceous cover. The loggerhead shrike is often found in open cropland, but nests in dense shrubs and small trees (Zeiner et al. 1988-1990).	**Not expected.** The Study Area is surrounded by orchards and generally lacks open habitat that this species prefers. This species may pass through the site but is not expected to be impacted by project activities. There are no documented occurrences within 5 miles of the Study Area (CDFW 2022).
Melospiza melodia pop. 1 *Song sparrow ("Modesto" population)*	SSC	Breeds in riparian thickets in shrubs or vines near fresh or saline emergent wetland. Nests are typically situated low to the ground or on the ground under dense riparian vegetation (Zeiner et al. 1990).	**Will not occur.** The Study Area lacks suitable riparian habitat to support this species.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Vireo bellii pusillus Least Bell's vireo	FE; SE	Is an obligate riparian species during the breeding season that prefers early successional habitat (USFWS 1998). Typically found in structurally diverse habitat such as cottonwood-willow forests, oak woodlands, and mule fat scrub (USFWS 1998) that generally contains both canopy and shrub layers and includes some associated upland habitat. This species will winter in arroyos that contain mesquite scrub habitat and are not limited to willow dominated habitats. Previously considered to be limited to southern California, recent account of this species with successful breeding in Salinas Valley and in Yolo County show that this species is expanding back into its former range (NatureServe 2020).	**Will not occur.** The Study Area lacks suitable riparian habitat to support this species.
Xanthocephalus xanthocephalus Yellow-headed blackbird	SSC	Occurs in California mainly as a summer migrant, but small numbers over-winter in the southern San Joaquin Valley and deserts. Breeds in marshes with tall emergent vegetation, generally along edges over deep water. Usually forages on seeds and aquatic insects within individual territories but may use nearby agricultural fields if resources are scarce (Shuford and Gardali 2008).	**Will not occur.** The Study Area lacks suitable aquatic habitat to support this species.

Scientific Name/Common Name[1]	Status[2]	Habitat, Ecology and Life History	Potential to Occur[3]
Mammals			
Antozous pallidus Pallid bat	SSC	Occurs throughout California except for the high Sierra Nevada and the northern Coast Ranges. Habitats include grasslands, shrublands, woodlands, and forests from sea level to 6,000 feet (Bolster, ed. 1998). This species is very sensitive to disturbance of roosting sites. Common roost sites are rock crevices, old buildings, bridges caves, mines, and hollow trees (Barbour and Davis 1969).	**Will not occur**. The Study Area does not contain suitable habitat for this species.
Sylvilagus bachmani riparius Riparian brush rabbit	SJMSCP; FE; SE	Inhabits dense brushy areas of valley riparian forest with wild rose, blackberries, and willows. Feed on grasses, and eat the leaves, bark and buds of many woody shrubs and vines along edges of shrub cover. The only remaining populations are limited to Caswell Memorial State Park along the Stanislaus River and an overflow channel of the San Joaquin River (USFWS 2007).	**Will not occur.** The Study Area lacks suitable riparian habitat to support this species. The Study is also located outside of the known geographic range of this species.

[1] Sensitive species reported in CNPS, CNDDB, and USFWS lists for the project site and vicinity.

[2] Status is as follows: Federal (ESA) listing/State (CESA) listing/other CDFW or CRPR. F = Federal (FESA); S = State of California (CESA); E = Endangered; T = Threatened; C = Candidate; R = Rare; FP = Fully Protected; SSC = Species of Special Concern; WL = Watch List.

[3] Status in the Project site is assessed as follows. **Will Not Occur**: Species is either sessile (*i.e.* plants) or so limited to a particular habitat that it cannot disperse on its own and/or habitat suitable for its establishment and survival Will not occur on the project site; **Not Expected**: Species moves freely and might disperse through or across the project site, but suitable habitat for residence or breeding Will not occur on the project site, potential for an individual of the species to disperse through or forage in the site cannot be excluded with 100% certainty; **Presumed Absent:** Habitat suitable for residence and breeding occurs on the project site; however, focused surveys conducted for the current project were negative; **May Occur**: Species was not observed on the site and breeding habitat is not present but the species has the potential to utilize the site for dispersal, **High**: Habitat suitable for residence and breeding occurs on the project site and the species has been recorded recently on or near the project site, but was not observed during surveys for the current project; **Present**: The species was observed during biological surveys for the current project and is assumed to occupy the project site or utilize the project site during some portion of its life cycle.

CRPR = California Rare Plant Rank: 1B – rare, threatened, or endangered in California and elsewhere; 2B – rare, threatened, or endangered in California but more common elsewhere; 3 – a review list. Extension codes: .1 – seriously threatened; .2 – moderately threatened; .3 – not very threatened.

Appendix C

Plant and Wildlife Species Observed in the Study Area

Family	Scientific Name	Common Name	Status/Rating[1]
Native			
Asteraceae	*Erigeron canadensis*	Canada horseweed	-
Cyperaceae	*Cyperus eragrostis*	tall flatsedge	-
Euphorbiaceae	*Croton setiger*	turkey-mullein	-
Fagaceae	*Quercus lobata*	valley oak	-
Solanaceae	*Datura wrightii*	Jimsonweed	-
Non-native			
Amaranthaceae	*Amaranthus albus*	tumbleweed	-
Araliaceae	*Hedera helix*	English ivy	High
Asteraceae	*Carduus pycnocephalus*	Italian thistle	Moderate
	Lactuca serriola	prickly lettuce	-
	Xanthium spinosum	spiny cocklebur	-
Brassicaceae	*Brassica nigra*	black mustard	Moderate
	Hirschfeldia incana	summer mustard	Moderate
Chenopodiaceae	*Chenopodium album*	lambs quarters	-
	Salsola tragus	prickly Russian thistle	Limited
Convolvulaceae	*Convolvulus arvensis*	morning glory	-
Cupressaceae	*Juniperus sp.*	ornamental juniper	-
Fabaceae	*Medicago polymorpha*	bur clover	Limited
Hamamelidaceae	*Liquidambar styraciflua*	sweetgum	-
Lamiaceae	*Marrubium vulgare*	white horehound	Limited
Malvaceae	*Malva parviflora*	cheeseweed	-
Myrsinaceae	*Lysimachia arvensis*	scarlet pimpernel	-
Pinaceae	*Cedrus deodara*	deodar cedar	-
Plantaginaceae	*Plantago lanceolata*	English plantain	Limited
Poaceae	*Avena barbata*	slim oats	Moderate
	Bromus diandrus	common ripgut grass	Moderate
	Bromus hordeaceus	soft brome	Limited
	Cynodon dacylon	Bermuda grass	-
	Festuca perennis	Italian ryegrass	Moderate
	Hordeum murinum	foxtail barley	Moderate
	Paspalum dilatatum	dallis grass	-
	Setaria pumila	yellow bristlegrass	-
Polygonaceae	*Polygonum aviculare*	prostrate knotweed	-
	Rumex crispus	curly dock	Limited
Rosaceae	*Prunus persica*	peach	-
Simaroubaceae	*Ailanthus altissima*	tree of heaven	-
Zygophyllaceae	*Tribulus terrestris*	puncture vine	Limited

[1] Cal-IPC Rating = Limited; Moderate; High

Order/Family	Scientific Name	Common Name
Birds		
Accipitiformes		
Accipitridae	*Buteo jamaicensis*	Red-tailed hawk
Cathartidae	*Cathartes aura*	Turkey vulture
Apodiformes		
Trochilidae	*Calypte anna*	Anna's hummingbird
Columbiformes		
Columbidae	*Zenaida macroura*	Mourning dove
Passeriformes		
Corvidae	*Aphelocoma californica*	Western scrub jay
	Corvus brachyrhyncus	American crow
Fringillidae	*Haemorhous mexicanus*	House finch
Pelicaniformes		
Ardeidae	*Ardea alba*	Great egret

Appendix D

Representative Site Photographs

Photo 1. View of the ruderal community looking west towards the peach orchard. Photo taken 8/8/2022.

Photo 2. View of the ruderal community looking east. Photo taken 8/8/2022.

Photo 3. View of the ruderal community looking east along a native surfaced access road. Photo taken 8/8/2022.

Photo 4. View of the ruderal community looking north at storage containers. Photo taken 8/8/2022.

Photo 5. View of the peach orchard in the western portion of the Study Area. Photo taken 8/8/2022.

Photo 6. View of the seasonal wetland with Alpine Road in the background. Photo taken 8/8/2022.

Photo 7. View of the seasonal wetland looking south from an existing road surface. Photo taken 8/8/2022.

Appendix D

Geotechnical Report

WallaceKuhl & ASSOCIATES | A Universal Engineering Sciences Company

Geotechnical Engineering Report

GARCIA GROW GREENHOUSES

WKA No. 4730.2200007.0000

May 17, 2022

Prepared for:

Garcia Grow CO LLC

1231 W. Robinhood Dr. M, Suite C5

Stockton, California 95207

Geotechnical Engineering Report

GARCIA GROW GREENHOUSES

North Alpine Road

Stockton, California

WKA No. 4730.2200007.0000

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Geotechnical Engineering Report
GARCIA GROW GREENHOUSES
Alpine Road
Stockton, California
WKA No. 4730.2200007.0000
May 17, 2022

INTRODUCTION

We have completed a geotechnical engineering study for a proposed greenhouse facility to be constructed near Stockton, California. The purpose of our study has been to explore the existing site, soil and groundwater conditions, and to provide geotechnical engineering conclusions and recommendations for the design and construction of the proposed development. This report presents the results of our study.

Scope of Services

Our scope of services for this project included the following tasks:

1. A site reconnaissance;
2. Review of geologic maps, historical aerial photographs, and available groundwater information;
3. Subsurface exploration, including the excavation of seven test pits to a maximum depth of approximately 10 feet below existing site grade;
4. Laboratory testing of selected soil samples to determine engineering properties of the soil;
5. Engineering analyses; and,
6. Preparation of this report.

Figures and Attachments

This report contains a Vicinity Map as Figure 1; a Site Plan showing the test pit locations as Figure 2; and the Logs of Test Pits as Figure 3. An explanation of the symbols and classification system used in developing the test pit logs is contained as Figure 4. Appendix A contains general information regarding project concepts, the exploratory methods used during our field investigation, and the laboratory test results that are not included on the logs.

Proposed Development

We understand the proposed facility will include four, single-story buildings ranging from 5,000 to 20,700 square feet in plan area enclosed by gravel covered fire access roads and a security fence. Structural details regarding the proposed buildings were unknown at the time this proposal was prepared. Based on previous experience, we anticipate the greenhouses will be tall, steel and aluminum framed structures supported on shallow spread foundations with a conventional floor slab. Column loads are anticipated to be less than 25 kips (dead-plus-live).

Grading plans were not available at the time this proposal was prepared. However, as the existing site topography appears to be essentially level, cuts and fills during earthwork are anticipated to be minimal (two feet or less in vertical extent) and limited to providing vehicular access and level building pads with positive site drainage. Excavations for underground utilities are not anticipated to exceed 5 feet below final site grade.

FINDINGS

Site Description

The rectangular-shaped project site lies west and adjacent to Alpine Road, about ½ mile north of East Main Street near Stockton, California. A vicinity map is provided as Figure 1. The property is bounded to the north and west by mature orchards; to the south by an unpaved farm road (New Water Road) and an orchard beyond; and to the east by Alpine Road and another orchard beyond.

At the time of our field explorations, the proposed building area was situated entirely within a mature orchard. The trees were planted in north-south trending rows about 18 to 20 feet apart, with most trees separated horizontally about 15 to 16 feet apart along the rows. Exposed soil and a light growth of weeds covered the surface between the trees. The south-central portion of the site was covered by disturbed soil with isolated areas of light to moderate vegetation and debris. A concrete slab, several mature trees, and what appears to be an abandoned well were in the southeast portion of the site. Various metal shipping containers were also located throughout this area. Topographically, the site was essentially level with a mean elevation of about +46 feet relative to mean sea level (msl) according to Google Earth Pro software (Google, 2022).

Historical Aerial Photograph Review

Several historical aerial photographs available on Google Earth Pro software (Google, 2018) and the website www.historicalaerials.com between 1967 through 2021 were reviewed.

Prior to a 2003 aerial photograph, the proposed building area was being cultivated with row crops. The existing orchard is visible in the 2003 photograph and appears to have remained unchanged until our field investigation.

In the 1967 aerial photograph, a home is visible near the southeast portion of the site with various irrigated landscaping and trees. The property west of the home (south-central portion of the site) is vacant and appears to be used for stockpiling equipment and/or crops and other materials. Two new structures are visible in a 1982 photograph northwest of the home. In a 2009 photograph, the home is no longer visible. The area appears to have remained essentially unchanged until about 2021 where a photograph shows all buildings and stockpiled materials had been removed.

General Site Geology

The project site is located near the central portion of the Great Valley geologic province, which is bound by the Sierra Nevada Mountains to the east, the Coast Ranges to the west, the Mojave Desert and Transverse Ranges to the south, and the Klamath Mountains to the north. The Great Valley is a large north-westward trending, asymmetric structural trough with a long, gently sloping eastern shelf underlain by the subsurface extension of the Sierran granitic rocks and a shorter more steeply sloping western margin where the basin sediments have been upturned and dip eastward back toward the valley axis. The Central Valley has been filled with more than 50,000 feet of sediment (Bertoldi and others, 1991; Harwood and Helley, 1985) derived primarily from erosion of the adjacent Sierra Nevada and Coast Range Mountains. The sediment ranges in age from the Jurassic to recent (approximately 210 to 1.6 million years old) while bedrock underlying the sediment are predominantly marine deposits of siltstone, claystone, and sandstone.

The local geology has been mapped by various authors. The maps that were reviewed for this study differ in scale and detail but consistently show that the site is underlain by alluvial deposits of the Modesto formation consisting of semi-consolidated clay, sand, and silt of Pleistocene (about 11,700- to 2.6-million-year-old) age derived from the high lands surrounding the Great Valley.

The United States Department of Agriculture, Natural Resources Conservation Service website (http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx), maps the project area as

being underlain by the alluvial Hollenbeck silty clay (Map Unit Symbol 173) to a depth of at least five feet that is cemented below a depth of about 3½ feet. The Hollenbeck silty clay is described as highly plastic (CH) with a high shrink-swell potential.

Subsurface Soil Conditions

The subsurface conditions at the site were explored on May 2, 2022, by excavating seven test pits to depths of about eight to 10 feet below the existing ground surface (bgs). The approximate test pit locations are presented as Figure 2.

The soil conditions encountered appear to be generally consistent with the mapped geology described above. However, when compared to the soil survey data discussed above, our test pits did not encounter any high-plasticity clays. Based on our findings, the surface and near-surface soils generally consisted of dark brown, very stiff to hard lean clay to depths of about one to two feet bsg, followed by reddish brown, very stiff to hard and variably cemented sandy clay to the depths explored. An about one-foot-thick stratum of silty sand was encountered at test pit TP3 at a depth of about five feet bsg. A clayey sand stratum was also encountered at test pit TP5 at a depth of about seven feet bsg.

The subsurface conditions described above are a generalized interpretation of the conditions encountered. For specific information regarding the soil conditions encountered at each exploration location, please refer to the exploration logs presented as Figure 3.

Groundwater

Groundwater was not encountered during our explorations. It is possible that our test pits may not have been left open long enough for groundwater to reach static equilibrium. To supplement this data, we reviewed available groundwater information at the California Department of Water Resources (DWR, 2018) website. The DWR periodically monitors groundwater levels (typically once in the spring and again in the fall) in wells across the state. Their website shows a monitored well (State Well No. 02N07E34R001M) located near the southeast corner of the project area. A summary of the recorded groundwater levels is presented below:

Well No.	Data Range		Highest Groundwater		Lowest Groundwater	
	From	To	Elev. (ft)[1]	Depth (ft)	Elev. (ft)[1]	Depth (ft)
02N07E34R001M	1969	2013	-11.4	60.5	-77.9	127

1. NAVD 88

Based on the data reviewed, it appears that groundwater elevations in the project area can and will fluctuate widely and that the recorded high groundwater elevation in the project area was about -11.4 feet (NAVD88), which is equivalent to about 57 feet below the lowest portions of the project site. This geotechnical evaluation assumes that high groundwater at the project site will not exceed this elevation.

CONCLUSIONS

We believe that the project is feasible from a geotechnical standpoint, provided the conclusions and recommendations presented in this report are incorporated into the project design and specifications. The principal geotechnical considerations are discussed in the following subsections.

Seismic Design Criteria

The 2019 California Building Code (CBC) references the American Society of Civil Engineers (ASCE) Standard 7-16 for seismic design. This year, ASCE 7-22 was published to supersede the previous ASCE 7-16 standard. At the time this report was prepared, the specific version governing design was unknown. Therefore, seismic design parameters are provided in Tables 2 and 3, based on both ASCE 7-16 and ASCE 7-22, respectively. Given the subsurface conditions encountered at the site and our previous experience in the project area, it is our judgement and opinion the soil at the project site can be designated as Site Class D in determining seismic design forces for this project.

The seismic design parameters provided in Table 2 were determined based on the latitude and longitude for the central portion of the site using the web interface developed by the *Structural Engineers Association of California* (SEAOC) and *California's Office of Statewide Health and Development* (OSHPD).

Table 2

2019 CBC SEISMIC DESIGN PARAMETERS				
Latitude: 37.973° N Longitude: -121.190° W	ASCE 7-16 Table/Figure	2019 CBC Table/Figure	Factor/ Coefficient	2019 CBC Value
Short-Period MCE_R at 0.2 second	Figure 22-1	Figure 1613.2.1(1)	S_S	0.64g

2019 CBC SEISMIC DESIGN PARAMETERS				
Latitude: 37.973° N Longitude: -121.190° W	ASCE 7-16 Table/Figure	2019 CBC Table/Figure	Factor/ Coefficient	2019 CBC Value
1.0 second Period MCE_R	Figure 22-2	Figure 1613.2.1(2)	S_1	0.26g
Soil Class	Table 20.3-1	Section 1613.2.2	Site Class	D
Site Coefficient	Table 11.4-1	Table 1613.2.3(1)	F_a	1.29
Site Coefficient	Table 11.4-2	Table 1613.2.3(2)	F_v	2.08*
Adjusted MCE Spectral Response Parameters	Equation 11.4-1	Equation 16-36	S_{MS}	0.82g
	Equation 11.4-2	Equation 16-37	S_{M1}	0.54g*
Design Spectral Acceleration Parameters	Equation 11.4-3	Equation 16-38	S_{DS}	0.55g
	Equation 11.4-4	Equation 16-39	S_{D1}	0.36g*
Seismic Design Category	Table 11.6-1	Table 1613.2.5(1)	Risk Category I to IV	D
	Table 11.6-2	Table 1613.2.5(2)	Risk Category I to IV	D

Notes: MCE = Maximum Considered Earthquake
g = gravity
* = The value is valid provided the requirements in Exception Note No. 2 in Section 11.4.8 of ASCE 7-16 are met. If not, a site-specific ground motion hazard analysis is required.

The seismic design parameters provided in Table 3 have been determined based on the site location and the web interface developed by ASCE (https://asce7hazardtool.online/).

Table 3

2022 CBC SEISMIC DESIGN PARAMETERS			
Latitude: 37.733° N Longitude: -121.363° W	ASCE 7-22 Table/Figure	Factor/Coefficient	ASCE 7-22 Values
0.2-second Period MCE_R	N/A	S_S	0.74g
1.0 second Period MCE_R	N/A	S_1	0.25g
Soil Class	Table 20.2-1	Site Class	D
	N/A	S_{MS}	1.07g

2022 CBC SEISMIC DESIGN PARAMETERS			
Latitude: 37.733° N Longitude: -121.363° W	ASCE 7-22 Table/Figure	Factor/Coefficient	ASCE 7-22 Values
Adjusted MCE_R Spectral Response Parameters	N/A	S_{M1}	0.67g
Design Spectral Acceleration Parameters	Equation 11.4-1	S_{DS}	0.71g
	Equation 11.4-2	S_{D1}	0.45g
Seismic Design Category	Table 11.6-1	Short Period Seismic Design Category I to IV	D
	Table 11.6-2	1-s Period Seismic Design Category I to III	D

Notes: MCE_R = Risk-Targeted Maximum Considered Earthquake; g = gravity

Soil Expansion Potential

Laboratory tests performed on representative samples of the near-surface soils show that the site is underlain by moderately plastic clay that has a "medium" potential for expansion[1] with increases in soil moisture content. These results are generally consistent with our previous findings in the Stockton area and poses a risk for future heave and cracking of concrete slabs, as well as lightly loaded foundations. Approaches to reduce the potential influence of expansive soil on the proposed improvements are presented in the *Recommendations* section.

Foundation Support

Based on the native subsurface conditions encountered, shallow spread foundations should provide adequate support for the anticipated light structural loads provided the recommendations presented in this report are incorporated into the project design and specifications. In areas of fill, the compacted native soils and/or an approved import soil should also provide adequate support for foundations provided they are placed and compacted in accordance recommendations provided in this report.

[1] The terms expansion or expansive soil generally apply to any soil that has a potential for swelling or heaving with seasonal or man-made increases in moisture content and shrinking or settling due to decreases in soil moisture content or drying.

Groundwater and Seasonal Moisture

Near-by well data and our current findings suggests that groundwater levels should not encroach near-surface or impede grading operations at the site. However, if site grading is performed during or following extended periods of rainfall (winter and spring months), the moisture content of the near-surface soils may be significantly above optimum and unstable.

Typical remedial measures include discing and aerating the soils during dry weather, mixing the soils with dryer materials, removing and replacing the soils with an approved fill material, stabilization with a geotextile fabric or grid, or mixing the soils with an approved hydrating agent such as a lime or cement product. Our firm should be consulted prior to implementing any remedial measure to observe the unstable subgrade condition and provide site-specific recommendations.

Soil Suitability for Engineered Fill Construction

The soils encountered are considered suitable for use in engineered fill construction provided these materials do not contain rubble, rubbish, significant roots concentrations or other organic materials and are at a moisture content appropriate for compaction. Imported materials, if necessary, should be granular and approved by our office prior to importing the materials to the site.

Excavation Conditions

The surface and near-surface soils at the site should be readily excavated using conventional earthmoving and trenching equipment. Shallow excavations (less than 5-feet deep) in the native clay or clay fill should stand vertically for a period long enough for typical foundation and utility excavations unless they become wet or are disturbed. The discontinuous sand encountered in two of the test pits, however, is cohesionless and may cave and/or slough soon after it is exposed in the excavation. Where encountered, the contractor should be prepared to brace or shore the excavations, as necessary.

Seismic Hazards

The general project area is characterized by recurring seismic activity. During the design life of the proposed improvements, it is probable that at least one earthquake will cause moderate ground shaking in the vicinity of the project. However, when compared to other areas of California, such as the Bay area and Southern California, the project area is seismically

quiescent. No active faults which displace valley alluvium are known to exist at or near the project site nor does the site lie within or adjacent to any Fault-Rupture Hazard Zones (formerly Alquist-Priolo Special Studies Zones) (Hart, 1990).

Soil liquefaction results from loss of soil strength during cyclic loading, such as those imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded fine-grained sands deposited during the Holocene age (present to 11,700 years ago). Although the evaluation of potential liquefaction hazards was not within the scope of this study; given the anticipated groundwater depth and that the sands encountered in our test pits were generally deposited during the Pleistocene age (about 11,700 to 2.6 million years ago), in our professional opinion the potential for liquefaction at the site is low.

Soil Corrosion Potential

Two samples of near-surface soil were submitted to Sunland Analytical Lab of Rancho Cordova, California, for testing to determine pH, chloride and sulfate concentrations, and minimum resistivity to help evaluate the potential for corrosive attack upon buried concrete. The results of the corrosivity testing are summarized in Table 4. Copies of the test reports are presented on Figures A4 and A5.

Table 4

SOIL CORROSIVITY TESTING			
Analyte	Test Method	Sample Identification	
		TP4 (0'-1')	TP5 (1'-3')
pH	CA DOT 643 Modified*	7.11	7.38
Minimum Resistivity	CA DOT 643 Modified*	1690 Ω-cm	1740 Ω-cm
Chloride	CA DOT 422	7.0 ppm	6.9 ppm
Sulfate	CA DOT 417	32.5 ppm	33.7 ppm

Notes: * = Small cell method, Ω-cm = Ohm-centimeters, ppm = Parts per million, mg/kg= milligrams per kilogram

The California Department of Transportation (Caltrans) 2018 Corrosion Guidelines (Version 3.0), considers a site to be corrosive to foundation elements if one or more of the following conditions exists for the representative soil sample taken: the soil has a chloride concentration greater than or equal to 500 ppm, sulfate concentration greater than or equal to 2,000 ppm, or the pH is 5.5 or less. Based on this criterion, the on-site soils tested are not considered

corrosive to concrete or steel reinforcement properly embedded within Portland cement concrete (PCC).

The California Amendments to Section 10.7.5 of the American Association of State Highway and Transportation Officials (AASHTO) bridge design specifications, 6th Edition (AASHTO 2012) considers soils to be corrosive to buried metals if the minimum resistivity is 1,000 ohm-cm or less. Based on this criterion, the on-site soils tested are also not considered significantly corrosive to buried metal.

Table 19.3.1.1 – Exposure Categories and Classes, of American Concrete Institute (ACI) 318-14, Section 19.3 – Concrete Design and Durability Requirements, as referenced in Section 1904.1 of the 2019 CBC, indicates the severity of sulfate exposure for the sample tested is Exposure Class S0 (water-soluble sulfate concentration in contact with concrete is low and injurious sulfate attack is not a concern). The project structural engineer should evaluate the requirements of ACI 318-14 and determine their applicability to the site.

Wallace-Kuhl & Associates are not corrosion engineers. Therefore, if it is desired to further define the soil corrosion potential at the site, a corrosion engineer should be consulted.

RECOMMENDATIONS

The recommendations presented below are appropriate for typical construction in the late spring through fall months. The on-site soils typically become very moist and wet following rainfall in the winter and early spring months, and often are not be suitable for earthwork without drying by aeration, chemical treatment, or geogrid stabilization. Should the construction schedule require work to start or continue during the wet months, additional recommendations can be provided as conditions warrant.

A representative of the Geotechnical Engineer should be present during all earthwork and ground improvement construction operations to evaluate compliance with the recommendations presented in this report and the project plans and specifications. The Geotechnical Engineer of Record referenced herein should be considered the Geotechnical Engineer that is retained to provide geotechnical engineering observation and testing services during construction.

Site Clearing

Construction areas should be cleared of any existing trees, other vegetation, organically laden soil, and any structures to expose firm and stable soils, as determined by the Geotechnical Engineer's representative. The area to be cleared should extend at least five feet beyond the edge of all exterior foundations and at least five feet beyond any exterior flatwork or gravel roads, where practical.

During tree removal, the entire root-ball, and any roots larger than ½-inch in diameter should be excavated, removed, and disposed off-site. Deep ripping and/or two- to three-foot-deep excavations will likely be required to adequately remove the roots. Laborers and handpicking may also be required to clear the subgrade soils to the satisfaction of the Geotechnical Engineer's representative.

Any existing underground utilities designated to be removed or relocated should include all trench backfill and bedding materials. Possible on-site wells, septic systems, or below-grade tanks were not noted at the site during the time our field exploration was performed. If any of these items are discovered, they should be properly abandoned in accordance with State and local requirements.

Debris from the clearing should not be used as general fill within structure, concrete slab, or gravel pavement areas. With prior approval from the Geotechnical Engineer and Landscape Architect, strippings may be used in landscape areas, provided they are kept at least five feet from the proposed improvements.

Depressions resulting from site clearing operations, as well as any loose, soft, disturbed, wet, or organically contaminated soils, as identified by the Geotechnical Engineer's representative, should be cleaned out to firm, undisturbed soils and backfilled with engineered fill. The depressions should be dish-shaped with sides sloped back at three horizontal to one vertical (3h:1v) or flatter to permit access for equipment and an adequate surface for compaction of the engineered fill. It is important that the Geotechnical Engineer's representative be present during site clearing operations to verify adequate removal of the surface and subsurface items, as well as the proper backfilling of resulting excavations. Construction bid documents should contain a unit price (price per cubic foot) for additional excavation required to remove roots or other subsurface structures and replacement with engineered fill.

Subgrade Preparation

The near-surface soils are relatively loose, and we anticipate that clearing operations will likely cause additional disturbance to the upper soils. Therefore, in all areas that will support concrete slabs, engineered fill or gravel roads, should be thoroughly scarified to a depth of at least 12 inches, brought to a uniform moisture content at least two percentage point above the optimum moisture content, and compacted to not less than 90 percent relative compaction[2] per ASTM D1557 specifications. In gravel road areas, the relative compaction of the upper six inches of final soil subgrade should be increased to 95 percent relative compaction.

To reduce the potential for post-construction heave and cracking due to the expansive clay conditions encountered at the site, the proposed buildings should be underlain by at least 12-inches of non-expansive fill. The non-expansive soil pads can be prepared by removing and replacing the native clay, raising the building pads above existing site grade, or a combination of both. Any floor slab underlayment, such as a capillary break or aggregate base, should not be considered part of the non-expansive fill layer. The zone of non-expansive soil should extend laterally at least three feet outside the perimeter of the structures. Prior to placement of the non-expansive fill, the exposed clay subgrade soil should be scarified and compacted to a minimum depth of 12 inches as discussed above. The moisture content of the clay should be maintained until placement of the non-expansive fill. A representative of the Geotechnical Engineer should perform a field check of the soil moisture content and relative compaction prior to placement of the non-expansive fill.

As an alternative to non-expansive fill, the upper 12-inches of native subgrade soil and/or clay fill within the proposed building areas could be mixed with dolomitic or high calcium quick lime (lime-treatment) and compacted to at least 90 percent relative compaction. Recommendations for lime-treatment are provided in the *Lime Treatment* section. Traditionally, lime-treatment tends to be more cost-effective than non-expansive fill and provides an added benefit in that it also acts as a cementing agent, increasing the strength and decreasing the flexibility of the subgrade soil. Based on our experience, floor slabs supporting equipment traffic and/or concentrated loads tend to exhibit less deflection and perform better overall. Lime-treated soil also tends to remain reasonably stable during and following rainfall, thus providing a firm, accessible working platform for construction. Lime treatment, however, increases the hardness and pH of the soil and may not promote plant growth. Accordingly, the Landscape Architect should be consulted prior to construction to verify that future landscaping is suitable for lime

[2] As used in this report, relative compaction refers to the in-place dry unit weight of soil expressed as a percentage of the maximum dry unit weight of the same soil as determined by the ASTM D1557 specification, latest edition.

treated soils. If the landscaping is not suitable, the lime-treated soils should be completely removed and replaced prior to planting.

The final subgrade preparation (i.e., scarification, moisture conditioning and compaction) in gravel road areas should be performed after underground utility construction is completed and just prior to gravel or aggregate base placement.

If construction begins during the summer or fall, there is a potential that the surface clayey soils may be desiccated deeper than the recommended depth of scarification. Should this condition exist, the site should be continuously watered for a sufficient period of time to close the desiccation cracks.

The prepared subgrade soils should be protected from disturbance until covered by capillary break material or aggregate base. Disturbed subgrade soils may require additional processing and recompaction just prior to construction of these improvements, depending on the level of disturbance.

All subgrade preparation must be performed in the presence of the Geotechnical Engineer's representative who will evaluate the performance of the subgrade under compaction loads and identify any loose or unstable soil conditions that could require remediation. Construction bid documents should contain a unit price (price per cubic foot) for additional excavation due to unsuitable materials and replacement with engineered fill.

Engineered Fill

From a geotechnical standpoint, the on-site soils are considered suitable for use as engineered fill provided that they do not contain significant quantities of organics, rubble and deleterious debris, and are at a proper moisture content to achieve the desired degree of compaction.

Engineered fill consisting of imported materials or native on-site sand should be placed in lifts not exceeding six inches in compacted thickness, with each lift being thoroughly moisture conditioned to at least the optimum moisture content and uniformly compacted to at least 90 percent relative compaction. All engineered fill consisting of clay should be placed in maximum six-inch lifts and moisture conditioned to at least two percentage points above the optimum moisture content and uniformly compacted to at least 90 percent relative compaction.

Imported fill materials should be compactable, well-graded, granular soils with a Plasticity Index not exceeding 15 when tested in accordance with ASTM D4318; an Expansion Index of 20 or

less when tested in accordance with ASTM D4829; and, should not contain particles greater than three inches in maximum dimension. In addition, except for imported aggregate base and bedding/initial fill materials for underground utility construction, the contractor should provide appropriate documentation for all imported fill materials that designates the import materials do not contain known contaminants per Department of Toxic Substances Control's guidelines for clean imported fill material (DTSC, 2001), and have corrosion characteristics within acceptable limits. Imported soils should be approved by the Geotechnical Engineer prior to being transported to the site.

Lime Treatment

Lime treatment consists of mixing the subgrade soils with dolomitic or high calcium quick lime and compacting the soil as engineered fill. The subgrade preparation, spreading, mixing, compacting and lime type should meet the requirements outlined in Section 24 of the Caltrans Standard Specifications. The zone of lime-treated soil should extend laterally at least three feet outside the perimeter of the structures and at least one foot outside the perimeter of gravel roads. Based on our previous experience, four percent quick lime by dry weight of the soil may be assumed for planning purposes based on dry soil unit weight of 110 pounds per cubic food (pcf). The lime treated subgrade soils should be compacted to at least 90 percent relative compaction.

At least two to three days prior to spreading or mixing the lime, the moisture content of the underlying, untreated clay soil should be checked. If the soil moisture content is found to be dry of optimum, the soil moisture content should be raised using liberal sprinkling, flooding, or another suitable method. A representative of the Geotechnical Engineer should be on-site during treatment operations to document spreading, mixing and compaction operations and provide supplemental/revised recommendations, if warranted, based on the soil conditions observed.

Following lime treatment, the treated soil should be properly cured by continual sprinkling with water to keep the surface damp, combined with light rolling to keep the surface knitted together. We suggest that the subgrade soils be covered with Class 2 aggregate base or crushed rock within two to three days of lime treatment to reduce drying. Periodic sprinkling is still required to keep the surface damp. As an alternative, the treated soil could be cured as discussed in Section 24 of the Caltrans Standard Specifications.

Temporary Excavations

Temporarily sloped and/or shored excavations less than 20 feet in depth should be constructed in accordance with federal, local and OSHA standards (29 CFR Part 1926) under the guidance of the Contractors qualified "competent person." For preliminary evaluation, the clay encountered would classify as Cal-OSHA Type B soil, while the sand would classify as Type C soils. In no case should the information provided be interpreted to mean that Wallace-Kuhl & Associates is assuming responsibility for site safety or the Contractor's activities.

Excavated materials should not be stockpiled directly adjacent to an open excavation to prevent surcharge loading of the excavation sidewalls. Heavy or frequent truck and equipment traffic should also be avoided near excavations. If material is stored or heavy equipment is stationed and/or operated near an excavation, a shoring system must be designed to resist the additional pressure due to the superimposed loads.

Utility Trench Backfill

Utility trench backfill should be mechanically compacted as engineered fill. Bedding of utilities and initial backfill around and over the pipe should conform to the pipe manufacturer's recommendations and the governing jurisdictional standards. If open-graded, crushed rock is used as bedding or initial backfill, an approved geotextile filter fabric should be used to separate the crushed rock from finer-grained soils. The intent of geotextile filter fabric is to prevent soil from migrating into the crushed rock (piping), which could result in trench settlement.

The on-site clay (in lieu of select sand/gravel/crushed rock backfill) should be used as utility trenches backfill within the building footprints, and extending at least five feet horizontally beyond perimeter foundations, to reduce water transmission beneath the buildings. Utility trench backfill should be placed as discussed in the *Engineered Fill* section. The lift thickness will be dependent of the type of compaction equipment used.

Underground utility trenches that are aligned nearly parallel with shallow foundations should be at least 3-feet from the outer edge of foundations, wherever possible. As a rule, trenches should not encroach into the zone extending outward at a 1H:1V inclination below the bottom of shallow foundations. Additionally, trenches parallel to shallow foundations should not remain open longer than 72 hours. The intent of these recommendations is to prevent loss of both lateral and vertical support of shallow foundations, resulting in possible settlement.

Shallow Spread Foundations

The proposed greenhouses may be supported upon continuous and isolated spread foundations. Due to expansive soil considerations, the foundations should extend at least 18 inches below lowest adjacent soil grade. Lowest adjacent soil grade is defined as the grade upon which the capillary break material is placed or exterior soil grade, whichever is lower. Continuous foundations should maintain a minimum width of 12 inches; while isolated spread foundations should be at least 24 inches in plan dimension. Foundations should be continuous around the perimeter of the building to reduce moisture variations beneath the structures. If shrinkage cracks appear in the foundation excavations, the excavations should be thoroughly moistened to close all cracks prior to placement of concrete.

Foundations bearing on undisturbed native soils, engineered fill, or a combination of those materials may be sized using a maximum allowable "net" soil bearing pressure of 3,000 pounds per square foot (psf) for dead plus live load. A one-third increase in the allowable bearing pressure may be applied when considering short-term loading due to wind or seismic forces. The weight of the foundation concrete extending below lowest adjacent soil grade may be disregarded in sizing computations.

Total settlement of an individual foundation will vary depending on the plan dimensions of the foundation and the actual load supported. Based on the foundation criteria discussed above and the assumed foundation loads, foundations are anticipated to experience a maximum total static settlement on the order of about ½-inch, and differential settlement on the order of about ½-inch for 50 lineal feet or the shortest distance of the structure, whichever is less.

All foundations should be adequately reinforced to provide structural continuity, mitigate cracking, and permit spanning of local soil irregularities. As a minimum, continuous foundations should be reinforced with at least four No. 4 reinforcement bars, placed two top and two bottom, to reduce the effects of potentially expansive soil by allowing the foundations the ability to span isolated soil irregularities. Continuous foundations should also be provided with No. 4 slab tie reinforcement bars, positioned at least every 54 inches, and penetrating at least two feet horizontally into the interior floor slab. The structural engineer should determine the need for additional reinforcement and the final detailing of the reinforcement.

Resistance to lateral foundation displacement may be computed using an allowable friction factor of 0.30, which may be multiplied by the effective vertical load on each slab foundation. Additional lateral resistance may be computed using an allowable passive earth pressure equivalent to a fluid pressure of 300 psf per foot of depth, acting against the vertical projection

of the foundation. These two modes of resistance should not be added together unless the frictional component is reduced by 50 percent since full mobilization of the passive resistance requires some horizontal movement, effectively reducing the frictional resistance. All foundation excavations be observed by the Geotechnical Engineer's representative prior to placement of reinforcement and concrete to verify firm bearing materials are exposed.

Conventional Floor Slabs

Conventional floor slabs in combination with shallow spread foundations may be used for support of the proposed structures. The interior concrete slabs should be at least four inches thick, however, the project structural or civil engineer should determine final floor slab thickness, reinforcement and joint spacing. Temporary loads exerted during construction from vehicle traffic, cranes, forklifts, other construction equipment, storage of palletized construction materials, etc. should be considered in the design of the thickness and reinforcement of the interior concrete slabs-on-grade.

Moisture Penetration Resistance

It is likely that the subgrade soils below floor slabs will become very moist or wet at some time during the life of the structures. This is a certainty if the subgrade soils are constructed during the wet season or poor drainage conditions exist adjacent to structures. For this reason, it should be assumed that interior floor slabs with moisture-sensitive floor coverings or coatings will require protection against moisture or moisture vapor penetration through the slabs.

Interior floor slabs for the planned buildings should, as a minimum, be underlain by a layer of free-draining crushed rock/gravel, serving as a deterrent to migration of capillary moisture. The crushed rock/gravel layer should be between four- and six-inches-thick and graded such that 100 percent passes a one-inch sieve and less than five percent passes a No. 4 sieve. Additional moisture protection may be provided by placing a vapor retarder membrane (at least 10-mils thick) directly over the crushed rock/gravel. The water vapor retarder membrane should meet or exceed the minimum specifications as outlined in ASTM E1745 and be installed in strict conformance with the manufacturer's recommendations.

Where interior concrete slabs are not be covered with moisture-sensitive floor coverings or coatings and will support forklift traffic, machinery, storage loads, etc., the crushed rock/gravel should be replaced with at least 4 inches of Class 2 aggregate base. The aggregate base would provide a leveling coarse and a stable, uniform bearing surface below the slabs. The

aggregate base should be compacted to at least 95 percent relative compaction. The vapor retarder membrane should be placed directly over the compacted aggregate base.

Floor slab construction practice over the past 30 years or more has included placement of a thin layer of dry sand or pea gravel over the vapor retarder membrane. The intent of the sand/pea gravel is to aid in the proper curing of the slab concrete. During the wet seasons, however, moisture can become trapped in the sand or pea gravel, which can lead to excessive moisture vapor emissions from floor slabs. As a consequence, we consider use of the sand/pea gravel layer as optional. The concrete curing benefits should be weighed against efforts to reduce slab moisture vapor transmission.

It is emphasized that the crushed rock/grave and the vapor retarder membrane suggested above provides only a limited, first line of defense against soil-related moisture issues and will not "moisture proof" the slab. Nor do these measures provide an assurance that slab moisture transmission levels will be within tolerable levels to prevent damage to floor coverings or other building components. If increased protection against moisture vapor penetration is desired, a concrete moisture protection specialist should be consulted. The design team should consider all available measures for slab moisture protection. It is commonly accepted that maintaining the lowest practical water-cement ratio in the slab concrete is one of the most effective ways to reduce future moisture vapor penetration of the completed slabs.

Ancillary Foundations

Foundations for lightly loaded, ancillary structures not structurally connected to the proposed buildings, such as sound walls, landscape walls, light poles, monuments, trash enclosures, or similar structures, may be supported upon conventional spread foundations or drilled, cast-in-place reinforced concrete piers (drilled piers).

Conventional Spread Foundations

Conventional spread foundations should bear on firm, undisturbed ground, engineered fill, or a combination of these materials, as confirmed by the Geotechnical Engineer or his representative. The spread foundations should be at least 12 inches wide and extend at least 18 inches below the lowest adjacent soil grade. The foundations may be sized using a maximum allowable soil bearing pressure of 2,000 psf, with a one-third increase for wind or seismic forces. Lateral foundation resistance may be determined using the factors presented in the *Slab Foundation* section. The upper 12 inches of subgrade soil should be disregarded when estimating lateral resistance.

Drilled, Cast-in-Place Concrete Piers

Drilled piers should be at least 18 inches in diameter, extend at least five feet below lowest adjacent soil grade, and sized using a maximum allowable end-bearing capacity of 3,000 psf or an allowable skin friction of 250 psf for dead plus live loads, which may be applied over the surface area of the pier. These values may be increased by one-third to include short-term wind or seismic forces. The weight of foundation concrete below grade may be disregarded in sizing computations.

Uplift resistance of drilled pier foundations may be computed using the following resisting forces, where applicable: 1) weight of the pier concrete and, 2) the allowable skin friction of 250 psf applied over the shaft area of the drilled pier. Increased uplift resistance can be achieved by increasing the diameter of the drilled pier or increasing the depth.

The upper 18 inches of skin friction should be neglected for axial capacity or uplift resistance unless the drilled pier is surrounded by slab concrete or pavements for a distance of at least three feet from the edge of the foundation.

Sizing of drilled piers to resist lateral loads can be evaluated using Section 1807.1 of the 2019 CBC. An allowable lateral soil bearing pressure of 200 psf per foot of depth may be used for the CBC parameters S_1 (equation 18-1) and S_3 (equations 18-2 and 18-3). If a deflection of ½ inch at the ground surface is acceptable, this value may be doubled. The upper 18 inches of the subgrade should be neglected when determining lateral resistance.

Reinforcement and concrete should be placed in the pier excavations as soon as possible after excavation is completed to reduce the potential for caving. In no case should the elapsed time between completion of the pier excavation and the start of concrete placement exceed 48 hours. If the piers are designed using the allowable vertical bearing pressure, the bottom of the pier excavations should be free of loose or disturbed soils prior to placement of the concrete. Cleaning of the bearing surface should be verified by the Geotechnical Engineer prior to concrete placement.

If drilled piers are designed using end-bearing capacity and seepage or groundwater is encountered, the water should be pumped from the pier excavation to allow inspection and concrete placement. If water is present during concrete placement, the concrete should be placed using tremie methods from the bottom of the hole, while always keeping the tremie pipe below the surface of the concrete.

Exterior Flatwork

The final subgrade for exterior concrete flatwork (i.e., sidewalks, patios, etc.) should be prepared and constructed in accordance with recommendation provided in the *Subgrade Preparation* section. The zone of non-expansive fill or lime-treated soils can be reduced to at least 1 foot laterally outside the perimeter of the flatwork.

The exterior flatwork concrete should be at least four inches thick and underlain by at least four inches of aggregate base compacted to at least 95 percent relative compaction to provide stability during slab construction and to protect the soils from disturbance during construction. Consideration should be given to thickening the edges of the slabs at least twice the slab thickness where wheel traffic is expected over the slabs. Expansion joints should be provided to allow for minor vertical movement of the flatwork. Exterior flatwork should be constructed independent of other structural elements by the placement of a layer of felt material between the flatwork and the structural element. The slab designer should determine the final thickness, strength and joint spacing of exterior slab-on-grade concrete. The slab designer should also determine if slab reinforcement for crack control is required and determine final slab reinforcing requirements.

Because of seasonal wetting and drying or irrigation of the soil, isolated differential movement and cracking sometimes forms along the outside edges of exterior flatwork. To reduce this risk, consideration should be given placing lateral cutoffs along the outside edges of the flatwork, doweling joints to reduce tripping hazards, and/or stiffening the flatwork by increasing the concrete thickness and including reinforcing steel.

Areas adjacent to new exterior flatwork should be landscaped to maintain more uniform soil moisture conditions adjacent to and beneath flatwork. Final landscaping plans should not allow fallow ground adjacent to exterior concrete flatwork.

Practices recommended by the Portland Cement Association (PCA) for proper placement, curing, joint depth and spacing, construction, and placement of concrete should be followed during exterior concrete flatwork construction.

Gravel Roads

We anticipate the access roads from Alpine Road and between and around the proposed buildings will need to support light vehicles, delivery trucks and occasional fire trucks. Using a design procedure outlined in the FHWA/AASHTO Gravel Roads Design Manual (2000), we

estimate that a gravel section consisting of at least eight inches of Class 2 aggregate base should be suitable where the access road is supported by compacted native clay. A gravel section consisting of at least six inches of Class 2 aggregate base should be suitable where the access road is supported by at least 12-inches of lime-treated soil. If heavier vehicle loads are anticipated, the gravel road section should be re-evaluated.

The gravel section was developed assuming an R-value of 5 for the anticipated clay subgrade soils, allowable rutting of two inches, a terminal serviceability factor of 2.5, and that adequate drainage will be provided. The gravel should be moisture conditioned to at least the optimum moisture content and compacted to at least 95 percent relative compaction.

Based on our experience, consideration should be given to placing a woven geotextile fabric (such as Mirafi 500X or a woven fabric with equivalent tensile strength and filtering characteristics) between the native clay subgrade soils and gravel section. The geotextile fabric would increase the gravel performance by decreasing the amount of lateral deflection (thus reducing rutting and potholing) and providing a separation between the subgrade soil and gravel section that would reduce the potential for clay to migrate into the gravel and weaken the section. If the subgrade soil is lime treated, the placement of a geotextile fabric would not be warranted.

As with all gravel roads, periodic maintenance will be required to repair disturbed areas and maintain the thickness of the gravel section.

Retaining Walls

All retaining walls, including loading dock walls, should be designed to resist the lateral soil pressures of the retained soils. Retaining walls that are fixed/restrained at the top should be capable of resisting an “at-rest” lateral soil pressure equal to an equivalent fluid pressure of 60 psf per foot of the wall height (fully drained conditions).

Retaining walls that will be allowed to slightly rotate about their base (unrestrained at the top or sides) should be capable of resisting an "active" lateral soil pressure equal to an equivalent fluid pressure of 40 psf per foot of wall height (fully drained conditions).

If structural elements, i.e., foundations, traffic areas, etc., encroach within a 1h:1v projection up from the bottom of retaining walls, the retaining walls should account for surcharge loads resulting from those elements. Additionally, retaining walls should also account for surcharge loads resulting from construction equipment, vehicles, palletized materials, etc. that encroach

the 1h:1v projection up from the bottom of the below-grade retaining walls. Surcharge loading under the circumstances described above should be evaluated by the retaining wall designer on a case-by-case basis and be included in their design of the walls. The retaining wall designer should evaluate the surcharge load distribution, magnitude of the surcharge resultant force to be applied on the walls, and the location of where the resultant force should be applied on the walls. Surcharge loading on the retaining walls will depend on the specific surcharge load type (e.g., point load, distributed load, etc.) and distance away from the retaining walls.

Retaining wall should be fully drained to prevent the build-up of hydrostatic pressures behind the wall by providing a minimum one-foot-wide drainage blanket of Class 2 permeable material, Caltrans Standard Specification, Section 68-2.02F(3), extending from the base of wall to within one foot of the top of the wall. The top foot above the drainage layer should consist of compacted on-site or imported engineered fill materials, unless covered by a concrete slab or pavement. Weep holes or perforated rigid pipe, as appropriate, should be provided at the base of the wall to collect accumulated water. Drainpipes, if used, should slope to discharge at no less than a one percent fall to suitable drainage facilities. Open-graded ½ to ¾ inch crushed rock may be used in lieu of the Class 2 permeable material provided the rock and drain-pipe are completely enveloped in an approved non-woven, geotextile filter fabric. An approved geotextile drainage composites, such as MiraDRAIN®, may be used in lieu of the drain rock layer. If used, geocomposite drain panels should be installed in accordance with the manufacturer's recommendations.

If efflorescence (discoloration of the wall face) or moisture/water penetration of the retaining walls is not acceptable, moisture/water-proofing measures should be applied to the back face of the walls. A moisture/water-proofing specialist should be consulted to determine specific protection measures against moisture/water penetration through the walls.

Structural backfill materials for retaining walls within a 1h:1v projection from the bottom of the walls (other than the drainage layer) should consist of imported, granular material or native sand and silt that does not contain significant quantities of rubbish, rubble, organics, and rock over four inches in size. Clay, pea gravel and/or crushed rock should not be used for structural wall backfill. Structural wall backfill should be placed, moisture conditioned and compacted in accordance with recommendations provided in the *Engineered Fill* section of this report.

Foundations for support of retaining or below grade walls should be designed using the appropriate foundation design parameters provided in the *Shallow Spread Foundations* section included in this report.

Site Drainage

Because of expansive soil concerns, the performance of foundations and concrete slabs relies on how well storm runoff and irrigation water drains from the site. Final site grading should be accomplished to provide positive drainage of surface water away from the buildings and prevent ponding of water adjacent to foundations, slabs or pavements. The subgrade adjacent to the buildings should be sloped away from the building at a minimum two percent gradient for at least five feet, where possible. All roof drains should be connected to non-perforated rigid pipes, which in-turn are connected to available drainage features that convey water away from the buildings or discharging the drainage onto paved or hard surfaces that slope away from the buildings. Landscape berms, if planned, should not be constructed in such a manner as to promote drainage toward the buildings.

Drought Considerations

The State of California can experience extended periods of severe drought conditions. Desiccated clay can shrink and crack and the ability for landowners to use irrigation as a means for maintaining landscape vegetation and soil moisture can be inhibited for unpredictable periods of time. For this reason, landscape and hardscape systems for this development should be carefully planned to prevent the desiccation of soils under and near foundations and slabs. Trees with invasive shallow root systems should be avoided. No trees or large shrubs that could remove soil moisture during dry periods should be planted within five feet of any foundation or slab. Fallow ground adjacent to foundations must be avoided.

Geotechnical Engineering Construction Observation Services

Wallace-Kuhl & Associates be retained to review the final plans and specifications to verify that the intent of our recommendations has been implemented in those documents.

Site preparation should be accomplished in accordance with the recommendations of this report. Geotechnical testing and observation during construction is considered a continuation of our geotechnical engineering investigation. Wallace-Kuhl & Associates should be retained to provide testing and observation services during site clearing, preparation, earthwork, and foundation construction at the project site to verify compliance with this geotechnical report and the project plans and specifications, and to provide consultation as required during construction. These services are beyond the scope of services authorized for this study; however, we can submit a proposal to provide these services upon request.

In the event that Wallace-Kuhl & Associates is not retained to provide geotechnical engineering observation and testing services during construction, the Geotechnical Engineer retained to provide these services should indicate in writing that they agree with the recommendations of this report, or prepare supplemental recommendations as necessary. A final report by the Geotechnical Engineer providing construction testing services should be prepared upon completion of the project.

LIMITATIONS

Our recommendations are based upon the information provided regarding the proposed project, combined with our analysis of site conditions revealed by the previous field explorations and associated laboratory testing programs. We have used engineering judgment based upon the information provided and the data generated from our study. This report has been prepared in substantial compliance with generally accepted geotechnical engineering practices that exist in the area of the project at the time the report was prepared. No warranty, either express or implied, is provided.

If the proposed construction is modified or re-sited; or, if it is found during construction that subsurface conditions differ from those we encountered at the previous exploration locations, we should be afforded the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations must be modified.

We emphasize that this report is applicable only to the proposed construction and the investigated site, and should not be utilized for construction on any other site. The conclusions and recommendations of this report are considered valid for a period of two years. If design is not completed and construction has not started within two years of the date of this report, the report must be reviewed and updated, if necessary.

Wallace - Kuhl & Associates

Gary H. Gulseth, GE
Senior Engineer

FIGURES

Spatial Data provided by Esri, NOAA, and USGS.
Projection: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

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VICINITY MAP

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	1
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

Approximate Test Pit Location

Approximate Razed Building Location

Approximate Site Boundary

N

0 100 200

Feet

Aerial imagery provided by Esri.
Projection: NAD 1983 2011 StatePlane California III FIPS 0403 Ft US

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SITE PLAN

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	2
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

LOGS OF TEST PITS

Test pits excavated on May 2, 2022, using a Case 580M rubber tire backhoe. Logged by Tyler Hicks.

TEST PIT 1

0’ to 1' Lean CLAY (CL); hard, dark brown, moist, medium plasticity, weakly cemented, roots visible to a depth of about 1 foot, [Pocket Penetrometer (PP)>4.5 tsf]

1' to 6’ Sandy CLAY (CL); stiff, reddish brown, moist, low to medium plasticity, weak to moderately cemented, (PP = 3.5 tsf)

6’ to 9’ Sandy CLAY (CL); stiff, brown, moist, low plasticity, moderately to strongly cemented, increase sand concentration

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]	Expansion Index (EI)[4]
1’ – 3’	23	86	--	--	--	42
3’ – 3.5’	24	82	--	--	--	--

(1) ASTM D2216, (2) ASTM D2937, (3) ASTM D4829

TEST PIT 2

0’ to 1.5' Lean CLAY (CL); hard, dark brown, moist, medium plasticity, weakly cemented, roots visible to a depth of about 1 foot, (PP > 4.5 tsf)

1.5' to 5.5’ Sandy CLAY (CL); very stiff, reddish brown, moist, low to medium plasticity, fine to medium grained sand moderately cemented, (PP = 3.5 tsf)

5.5’ to 8’ Sandy CLAY (CL); reddish brown, moist, low to medium plasticity, weakly cemented, easier excavating

8’ to 9’ Sandy CLAY (CL); reddish brown, moist, low to med plasticity, moderately to strongly cemented, calcified, difficult excavating

9’ to 10’ Sandy CLAY (CL); brown, moist, low to medium plasticity, weakly cemented, easier excavating

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]
1.5' – 2'	19	108	--	--	--
4' – 4.5'	22	99	--	--	--

(1) ASTM D2216, (2) ASTM D2937

TEST PIT 3

0' to 1' Lean CLAY (CL); hard, grayish brown, moist, medium plasticity, weakly cemented, roots visible to a depth of about 1 foot, (PP > 4.5 tsf)

1' to 5' Sandy CLAY (CL); very stiff, reddish brown, moist, low to medium plasticity, moderately cemented, (PP = 3.5 tsf)

5' to 6' Silty SAND (SM); brown, moist, fine to medium grained

6' to 6.5' Sandy CLAY (CL); light brown, moist, low to medium plasticity, moderately to strongly cemented, calcified, more difficult to excavate

6.5' to 9' Sandy CLAY (CL); brown, moist, low to medium plasticity, moderately cemented, easier to excavate

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]
0' - 1'	18	101	34	18	--
3' – 3.5'	8	74	--	--	14

(1) ASTM D2216, (2) ASTM D2937, (3) ASTM D4318, (4) ASTM D1140

TEST PIT 4

0' to 1' Lean CLAY (CL); hard, dark brown, moist, medium plasticity, weakly cemented, roots visible to a depth of about 2 feet, (PP > 4.5 tsf)

1' to 6' Lean CLAY with sand (CL); very stiff, reddish brown, moist, low to medium plasticity, moderately cemented, (PP = 3.5 tsf)

6' to 8' Lean CLAY with sand (CL); reddish brown, moist, low to medium plasticity, weakly cemented, easier to excavate

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]
1’ – 1.5’	21	95	--	--	--
3’ – 3.5’	23	88	--	--	--

(1) ASTM D2216, (2) ASTM D2937

TEST PIT 5

0’ to 1' Lean CLAY (CL); very stiff, dark brown, moist, medium plasticity, weak cementation, roots visible to a depth of about 1 foot, (PP = 3.5 tsf)

1' to 3.5’ Sandy CLAY (CL); hard, reddish brown, moist, low to medium plasticity, moderately cemented, (PP > 4.5 tsf)

3.5’ to 7’ Sandy CLAY (CL); very stiff, reddish brown, moist, medium plasticity

7’ to 9’ Clayey SAND (SC); brown, moist, fine to medium grained, weakly cemented, easier to excavate

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]
2’- 2.5’	19	103	--	--	--

(1) ASTM D2216, (2) ASTM D2937

TEST PIT 6

0’ to 2' Lean CLAY (CL); hard, dark brown, moist, medium plasticity, weak cementation, roots visible to a depth of about 1 foot, (PP > 4.5 tsf)

2' to 6’ Sandy CLAY (CL); very stiff, brown, moist, low to medium plasticity, (PP = 3.0 tsf), weak to moderate cementation

6’ to 7’ Sandy CLAY (CL); reddish brown, moist, low to medium plasticity, weak cementation, easier to excavate

7’ to 8’ Sandy CLAY (CL); grayish brown, moist, low to medium plasticity, weak cementation, increase sand concentration

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]	Expansion Index (EI)[4]
0’ – 2’	9	87	--	--	--	78

(1) ASTM D2216, (2) ASTM D2937, (3) ASTM D4829

TEST PIT 7

0’ to 2' Lean CLAY (CL); very stiff, dark brown, moist, medium plasticity, weak cementation, roots visible to a depth of about 1 foot, (PP = 2.5 tsf)

2' to 5’ Lean CLAY with sand (CL); hard, reddish brown, moist, low to medium plasticity, weakly cemented, (PP > 4.5 tsf), easier to excavate around 4’

5’ to 7’ Sandy CLAY (CL); reddish brown, moist, low plasticity, weakly to moderately cemented nodules

6’ to 7’ Silty CLAY (CL); grayish brown, moist, fine to medium grained, not cemented, easier to excavate

Groundwater or seepage not observed.

Approx. Sample Depth Interval (ft)	Moisture Content (%)[1]	Dry Density (pcf)	Liquid Limit (%)[2]	Plasticity Index (%)[2]	Passing #200 Sieve (%)[3]
1’ – 1.5’	21	92	--	--	--

(1) ASTM D2216, (2) ASTM D2937

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487)

MAJOR DIVISIONS		USCS[4]	CODE	CHARACTERISTICS
COARSE GRAINED SOILS (More than 50% of soil > no. 200 sieve size)	GRAVELS[1] (More than 50% of coarse fraction > no. 4 sieve size)	GW		Well-graded gravels or gravel - sand mixtures, trace or no fines
		GP		Poorly graded gravels or gravel - sand mixtures, trace or no fines
		GM		Silty gravels, gravel - sand - silt mixtures, containing little to some fines[2]
		GC		Clayey gravels, gravel - sand - clay mixtures, containing little to some fines[2]
	SANDS[1] (50% or more of coarse fraction < no. 4 sieve size)	SW		Well-graded sands or sand - gravel mixtures, trace or no fines
		SP		Poorly graded sands or sand - gravel mixtures, trace or no fines
		SM		Silty sands, sand - gravel - silt mixtures, containing little to some fines[2]
		SC		Clayey sands, sand - gravel - clay mixtures, containing little to some fines[2]
FINE GRAINED SOILS (50% or more of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts, gravely silts, and sandy silts that are non-plastic or with low plasticity
		CL		Inorganic lean clays, gravelly lean clays, sandy lean clays of low to medium plasticity[3]
		OL		Organic silts, organic lean clays, and organic silty clays
	SILTS & CLAYS LL ≥ 50	MH		Inorganic elastic silts, gravelly elastic silts, and sandy elastic silts
		CH		Inorganic fat clays, gravelly fat clays, sandy fat clays of medium to high plasticity
		OH		Organic fat clays, gravelly fat clays, sandy fat clays of medium to high plasticity
HIGHLY ORGANIC SOILS		PT		Peat
ROCK		RX		Rocks, weathered to fresh
FILL		FILL		Artificially placed fill material

OTHER SYMBOLS

= Drive Sample: 2-1/2" O.D. Modified California sampler

= Drive Sampler: no recovery

= SPT Sampler

= Initial Water Level

= Final Water Level

— — — = Estimated or gradational material change line

——— = Observed material change line

Laboratory Tests

CR = Corrosion
PI = Plasticity Index
EI = Expansion Index
UCC = Unconfined Compression Test (TSF)
TR = Triaxial Compression Test
GR = Gradational Analysis (Sieve/Hydro)
FC = Wash (Fines Content)
PP = Pocket Penetrometer Test (TSF)
PID = Photo Ionization Detector Test (PPM)
RV = Resistance ("R") Value

REF = Refusal (>50 blows in 6 inches)

GRAIN SIZE CLASSIFICATION

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS (b)	Above 12"	Above 300
COBBLES (c)	12" to 3"	300 to 75
GRAVEL (g) coarse fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	75 to 4.75 75 to 19 19 to 4.75
SAND coarse medium fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.75 to 0.075 4.75 to 2.00 2.00 to 0.425 0.425 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

Trace - Less than 5 percent
Few - 5 to 10 percent
Little - 15 to 25 percent
Some - 35 to 45 percent
Mostly - 50 to 100 percent

* Percents as given in ASTM D2488

NOTES:

1. Coarse grained soils containing 5% to 12% fines, use dual classification symbol (ex. SP-SM).
2. If fines classify as CL-ML (4<PI<7), use dual symbol (ex. SC-SM).
3. Silty Clays, use dual symbol (CL-ML).
4. Borderline soils with uncertain classification list both classifications (ex. CL/ML).

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UNIFIED SOIL CLASSIFICATION SYSTEM

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	4
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

APPENDICES

APPENDIX A
General Information, Field Exploration and Laboratory Testing

APPENDIX A

A. GENERAL INFORMATION

The geotechnical engineering study for the Garcia Grow Greenhouses, located at 407 Alpine Road near Stockton, California, was authorized by Mr. Joseph Cohart on April 25, 2022. Authorization was for a study as described in our proposal dated April 14, 2022, sent to our client Garcia Grow Co LLC at 1231 West Robinhood Drive, Suite C5 in Stockton, California; telephone (209) 986-5601.

B. FIELD EXPLORATION

The subsurface soil conditions at the project site were explored on May 2, 2022, by excavating seven test pits using a tire-mounted backhoe to depths of about eight to ten feet below the existing ground surface (bgs) using a tire-mounted backhoe equipped with an 18-inch bucket. The test pit locations are shown in Figure 2.

During the test pit excavations, a field engineer with our firm collected representative soil samples and visually classified the soil recovered in accordance with Unified Soil Classification System (USCS) in general conformance with ASTM D2487. A pocket penetrometer was used to evaluate the consistency of the fine-grained (cohesive) soils exposed in the sidewall of the test pits. The discrete soil samples recovered were placed in plastic bags and sealed to preserve the natural moisture contents. In addition, representative bulk samples of the subgrade soils were collected and retained in plastic bags. All samples were taken to our laboratory for additional soil classification and selection of samples for testing.

The Logs of Test Pits containing descriptions of the soils encountered in each of the test pits excavated for this study are presented on Figure 3. A Legend explaining the Unified Soil Classification System (ASTM D2487) and the symbols used on the logs is contained in Figure 4.

C. LABORATORY TESTING

Selected undisturbed samples of the soils were tested to determine dry unit weight (ASTM D2937), natural moisture content (ASTM D2216), and percent soil passing the No. 200 sieve. The results of these tests are included in the test pit logs at the depth each sample was obtained.

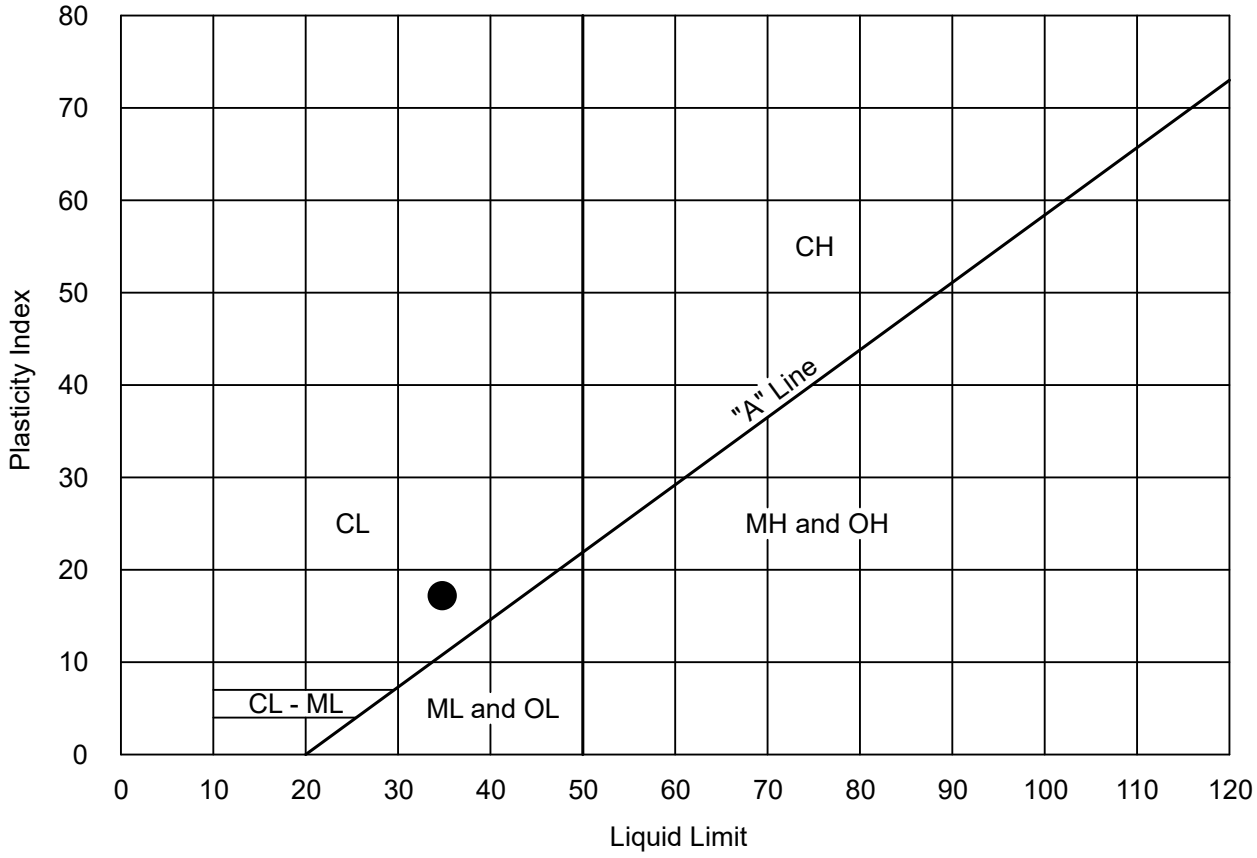
One soil sample was tested to determine the liquid limit, plastic limit and plasticity index of the soil using the Atterberg Limits test (ASTM D4318). The results of the test are presented in Figure A1 and included in the test pit log.

Two bulk samples of the near-surface fine-grained (plastic) soil were tested to estimate the expansion potential of the soils using the Expansion Index test (ASTM D4829) with results presented in Figures A3 and A3 and included in the test pit logs.

Two selected soil samples of near-surface soil were submitted to Sunland Analytical of Rancho Cordova, California, to determine the soil pH and minimum resistivity (California Test 643), Chloride concentration (California Test 422m), and Sulfate concentration (California Test 417). The results of these tests are presented in Figures A4 and A5.

ATTERBERG LIMITS

ASTM D4318



KEY SYMBOL	LOCATION	SAMPLE DEPTH	NATURAL WATER CONTENT (%)	ATTERBERG LIMITS		PASSING No. 200 SIEVE (%)	UNIFIED SOIL CLASSIFI-CATION SYMBOL
				LIQUID LIMIT (%)	PLASTICITY INDEX (%)		
●	TP3	0'-1.0'	18	34	18	---	CL

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ATTERBERG LIMITS

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	A1
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

EXPANSION INDEX TEST RESULTS

ASTM D4829

MATERIAL DESCRIPTION: Reddish brown, sandy lean clay

LOCATION: TP1

Sample Depth	Pre-Test Moisture (%)	Post-Test Moisture (%)	Dry Density (pcf)	Expansion Index
1' - 3'	12.9	23.5	101	**42**

CLASSIFICATION OF EXPANSIVE SOIL *

EXPANSION INDEX	POTENTIAL EXPANSION
0 - 20	Very Low
21 - 50	**Low**
51 - 90	Medium
91 - 130	High
Above 130	Very High

* From ASTM D4829, Table 1

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EXPANSION INDEX

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	A2
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

EXPANSION INDEX TEST RESULTS

ASTM D4829

MATERIAL DESCRIPTION: Dark brown, lean clay with sand

LOCATION: TP6

Sample Depth	Pre-Test Moisture (%)	Post-Test Moisture (%)	Dry Density (pcf)	Expansion Index
0’ - 2’	11.0	23.6	106	**78**

CLASSIFICATION OF EXPANSIVE SOIL *

EXPANSION INDEX	POTENTIAL EXPANSION
0 - 20	Very Low
21 - 50	Low
51 - 90	**Medium**
91 - 130	High
Above 130	Very High

* From ASTM D4829, Table 1

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EXPANSION INDEX

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	A3
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

Sunland Analytical

11419 Sunrise Gold Circle, #10
Rancho Cordova, CA 95742
(916) 852-8557

Date Reported 05/06/2022
Date Submitted 05/03/2022

To: Tyler Hicks
Wallace-Kuhl & Assoc.
3050 Industrial Blvd
West Sacramento, CA 95691

From: Gene Oliphant, Ph.D. \ Randy Horney
General Manager \ Lab Manager

The reported analysis was requested for the following location:
Location : 4730.2200007.0000 Site ID : TP4 BULK (0-1).
Thank you for your business.

* For future reference to this analysis please use SUN # 87291-181586.

EVALUATION FOR SOIL CORROSION

Soil pH	7.11		
Minimum Resistivity	1.69 ohm-cm (x1000)		
Chloride	7.0 ppm	00.00070	%
Sulfate	32.5 ppm	00.00325	%

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m

WallaceKuhl & Associates — A Universal Engineering Sciences Company

CORROSION TEST RESULTS

GARCIA GROW GREENHOUSES

Stockton, California

FIGURE	A4
DRAWN BY	RWO
CHECKED BY	TAH
PROJECT MGR	GHG
DATE	05/2022
4730.2200007.0000	

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The reported analysis was requested for the following location:
Location : 4730.2200007.0000 Site ID : TP5 BULK (1-3).
Thank you for your business.

* For future reference to this analysis please use SUN # 87291-181587.

EVALUATION FOR SOIL CORROSION

Soil pH	7.38	
Minimum Resistivity	1.74 ohm-cm (x1000)	
Chloride	6.9 ppm	00.00069 %
Sulfate	33.7 ppm	00.00337 %

METHODS
pH and Min.Resistivity CA DOT Test #643
Sulfate CA DOT Test #417, Chloride CA DOT Test #422m

WallaceKuhl & ASSOCIATES — A Universal Engineering Sciences Company	**CORROSION TEST RESULTS** GARCIA GROW GREENHOUSES Stockton, California	FIGURE A5 DRAWN BY RWO CHECKED BY TAH PROJECT MGR GHG DATE 05/2022 4730.2200007.0000

Appendix E

Waste Management Plan

WASTE MANAGEMENT PLAN

"Green Waste" that comes from our growing operation will include the following: cannabis stalks and roots, trimmed materials, along with contaminated, spoiled, or damaged plants that will be removed by Cannabis waste Solutions. Cannabis Waste Solutions is fully licensed and complies with all of the rules set forth by the Bureau of Cannabis Control (BCC), CalCannabis, the Manufactured Cannabis Safety Branch (MCSB) and CalRecycle.

Cannabis Waste will be stored in a designated waste area in the following locked receptacles:

- (1) 50-gallon secure polyethylene containers
- (1) 12 Yard Roll-Off Bin

Cannabis Waste Removal:

Cannabis Waste Solutions will remove all waste from our location and thoroughly document the process through our California Cannabis Waste Manifest System. Every scheduled service appointment CWS will remove full waste bins from the property and replace it with an empty one. Once the waste is removed from the premises, CWS will provide us three forms of manifests for our record keeping.

Cannabis Flower Destruction:

Cannabis flower waste will be rendered unusable on site by CWS before removal, and will be in total regulatory compliance.

Cannabis Waste Checklist:

The following checklist will be used to ensure state and local compliance

- Do not sell, transfer, donate, or give away any cannabis waste.
- Dispose cannabis waste only in a secured waste receptacle specifically designated for cannabis waste.
- Keep cannabis waste in a secured designated waste location on licensed premises until it can be collected.
- Make cannabis goods into cannabis waste by rendering the goods unusable and unrecognizable at minimum by removing any packaging.
- Record date and time the cannabis goods were rendered into cannabis waste.
- After collection, obtain a manifest from hauler that indicates the date and time of each collection and confirmation of disposal at the solid waste or composting facility.
- Maintain records of all activity related to the generation and disposal of the cannabis waste.